Green Auditing of Campus of Regional Institute of Education (RIE), National Council of Educational Research and Training (NCERT), Mysore

Sponsored By

Regional Institute of Education, NCERT

CSIR – National Environmental Engineering Research Institute

March – 2023

FORWORD

The Regional Institute of Education, Mysore (Formerly Regional College of Education) founded on 1st August, 1963, is one of five such institutions established by the National Council of Educational Research and Training (NCERT), New Delhi. The other Institutes are located at Ajmer, Bhopal, Bhubaneswar, and Shillong. The Regional Institutes was established with the goal of improving the quality of school instruction through creative pre-service and in-service teacher preparation program, research, development, and extension initiatives.

The Regional Institute of Education in Mysore has established an image for itself as a reputable institution for teacher and school education. The institute has made an effort to handle the obligations and problems brought on by changes in the country's and the southern region's educational scenario. The Institute has been functioning as the Regional Institute of Education since 1995, following a major shift in its focus from pre-service Education to in- service Education. In this regard, RIE Mysore approached CSIR-NEERI to conduct the green audit study.

The purpose of the green audit was to ensure that, the practices followed on the campus are in accordance with the Green Policy adopted by the institution. The study comprises preparing and filling out a questionnaire, physically inspecting the campus, watching, and reviewing the document, interacting with the people who are responsible, analysing the data, taking measurements, and making recommendations. Based on the observations several recommendations and management plans for water, waste, energy and green campus are given.

The help and cooperation extended by officials of RIE Mysore are gratefully acknowledged.

March, 2023

Nagpur

Director

निदेशक / Director
सी.एस.आई.आर.-राष्ट्रीय पर्यावरण अभियांत्रिकी अनुसंधान संस्थान
CSIR-National Environmental Engineering Research Institute
नेहरू मार्ग/, नागपुर-440 020 (भारत)
Nehru Marg, Nagpur-440 020 (India)

Index

Sr. No.	Title	Page No
Chapter 1	**Introduction**	7
1.1	About the Institute	7
1.2	Objectives of the Institute	8
1.3	Courses offered	9
1.4	Campus Infrastructure and layout	10
1.5	Land use data including build-up area and plantation area	12
Chapter 2	**Pre-Audit Stage**	22
2.1	Scope and Goals of Green Audit	22
2.2	Benefits of Green Audit	22
2.3	Target Areas of Green Audit	23
2.3.1	Audit of Water Management	24
2.3.2.	Audit of Energy Management	24
2.3.3.	Audit for Waste Management	24
2.3.4.	Audit of Green Campus Management	25
2.4	Methodology	25
2.4.1	Data Collection	26
2.4.2	Data Analysis and Recommendations	26
2.4.3	Pre Audit Questionnaires	26
Chapter 3	**Post-Audit Stage**	29
3.1.	Post-Audit Stage	29
3.2.	Observation	30
3.2.1.	Water	30
3.2.2	Energy	31
3.2.3.	Waste	32
3.2.4.	Green Campus	33
3.3	Major Audit Observation	39
3.3.1.	Water Audit	39
3.3.2.	Energy Audit	39
3.3.3.	Waste Audit	40
3.4.	Weather of Mysore	41
3.4.1.	Weather Data of Mysore	41
3.4.2.	Description	41
3.5.	Air Quality	42
3.5.1.	Air Quality Index	42
3.5.2.	Air Quality of Mysore	43
3.6.	Noise Quality of Mysore city	44
3.6.1.	Measure to reduce noise pollution	45
3.7.	Ecology	50
3.7.1.	Floral Diversity	50
3.7.1.1.	Suitability of Mysore weather for floral biodiversity	50
3.7.2.	Floral diversity of RIE Campus	51
3.7.2.1.	Bryophytes of RIE Campus	51
3.7.2.2.	Pteridophytes of RIE Campus	51

3.7.2.3.	Gymnosperms of RIE Campus	52
3.7.2.4.	Angiosperms of RIE Campus	52
3.7.2.5.	Medicinal plants of RIE Campus	52
3.7.2.6.	Endangered, critically endangered and vulnerable plants of NIE campus	52
3.7.3.	Plant species present in garden of RIE Campus	52
3.7.4.	Agricultural practices of RIE Campus	64
3.7.4.1	Coconut trees plantation	64
3.7.4.2	Mango trees plantation	64
3.7.4.3	Traditional old and unique seed collections	65
3.7.4.4	Organic pesticides	65
3.7.4.5	Organic fertilizer	65
3.7.4.6	Vermicomposting	65
3.7.4.7	Nursery	66
3.7.4.8	Dasara flower competition	66
3.7.4.9	Kitchen garden	66
3.7.4.10	Greenhouse	66
3.8	Fauna of RIE Campus	74
3.9	Eco-friendly Activities of RIE Campus	87
3.10	Other Observation	91
3.10.1	Facilities for Girls in Hostels	91
Chapter 4	**Recommendations and Management Plans**	93
4.1	Recommendations and Management Plan for RIE	93
4.2	Follow-up Management Plans	93
4.3	Environmental Education	94
4.4	Common Recommendations	95
4.5	Criteria wise Recommendations	96
4.5.1.	Water	96
4.5.2	Energy	96
4.5.3	Waste	96
4.5.4	Green campus	97
4.6.	Management Plans	97
4.6.1	Waste Treatment Management Plan	97
4.6.2.	Solid waste management	97
4.6.2.1	Make compost pit in each quarter	97
4.6.2.2	Other Methods	98
4.6.3	Biogas Plant	99
4.6.3.1	Advantage	99
4.7	Wastewater Treatment Management	100
4.7.1	Sewage Treatment Plant	100
4.7.1.1	Advantages	102
4.8	Energy Management	102
4.8.1	Solar Plant	102
4.8.1.1.	Benefits	102
4.9	Green campus Management	104
4.9.1	Build Medicinal plant Gardens on the Premises	104
4.10	Management plan for Good Laboratory Practices	111

4.10.1	No food or no drink	111
4.10.2	Wear PPE and the appropriate lab attire	111
4.10.3	Proper hygiene	111
4.10.4	Use of proper storage Containers	112
4.10.5	Labeling of Work Space	112
4.10.6	Avoid Working Alone	112
4.10.7	Maintain Awareness of the Atmosphere	112
4.10.8	Chemical Waste Disposal	113
4.10.9	Different color Bins for waste disposal in a laboratory	114
4.10.10	Take part in safety practices	114
Chapter 5	**Conclusion**	115
5.	Conclusion	115
	References	116
	Working Team Picture	117

List of Figures

Sr.No.	Title	Page No.
Chapter 1		
1.1	Campus layout Map	10
1.2	RIE Mysore around a 1 km radius	10
1.3	RIE Campus View	15
1.4	Girls Hostels (Ganga, Narmada, and Saraswati)	16
1.5	Boys Hostels (Kaveri and Krishna)	17
1.6	Science Park of campus	18
1.7	Library RIE campus	19
1.8	Old Books Library on campus	19
1.9	Chemistry Laboratory of campus	20
1.10	Health Clinic of RIE	21
1.11	The dining room of girls' hostel	21
Chapter 3		
3.1	Water bill of the campus	37
3.2	Electricity bill of campus	38
3.3	Rainwater Harvesting in RIE Mysore	47
3.4	Open drainage from the hostel	48
3.5	Wastewater from hostels used for gardening	48
3.6	Dust Bins placed near hostels	49
3.7	Flora of RIE Campus	53
3.8	Flora of RIE Campus	54
3.9	Croton garden of RIE campus	55
3.10	Different plant species (Dracaena, croton, sampleetc) in garden	55
3.11	Rose Garden at RIE Mysore	56
3.12	Mango Plantation at RIE campus	67
3.13	Coconut Plantation at RIE campus	68
3.14	Green House at RIE campus	69

3.15	Kitchen Garden at RIE campus	70
3.16	Vegetables harvest in the kitchen garden the of RIE campus	71
3.17	Distribution of vegetables to students of RIE	71
3.18	Compost and Vermicompost at RIE campus	72
3.19	Cows and symbiotic relation with Egrets at RIE campus	72
3.20	Dasara Flower Show at RIE campus	73
3.21	Certificate of first prize in Dasara flower show competition	73
3.22	Mammals at the RIE campus	81
3.23	Birds RIE campus	82
3.24	Reptiles at the RIE campus	83
3.25	Molluscans at RIE campus	84
3.26	Arachnids at RIE campus	84
3.27	Insects at RIE campus	85
3.28	Lepidopterans at RIE campus	86
3.29	Plantation by ECO warrior's group students at the RIE campus	87
3.30	Plantation by NCC Students at the RIE campus	88
3.31	Plantation done by a staff member	89
3.32	Environmental Rally at RIE campus	90
3.33	The shopping complex of RIE (not started yet)	91
3.34	Working of underground wire lines	92
3.35	Apiculture at RIE campus	92
Chapter 4		
4.1	Example of waste management by the composting pit in each quarter	98
4.2	Plastic Management Plan for RIE	99
4.3	Sewage Treatment Plant	101
4.4	Four different color bins for the laboratory	114

List of Tables

Sr. No.	Title	Page No.
Chapter 3		
3.1	Different wastes Disposal Method	40
3.2	Weather of Mysore by month	41
3.3	Air monitoring data of Mysore	43
3.4	Air quality index descriptor	44
3.5	Mysore city air quality forecast	44
3.6	The magnitude of noise levels from some common noise sources in Mysore	45
3.7	Bryophytes, Pteridophytes and Gymnosperms present in RIE Mysore	56
3.8	Angiosperms of the RIE campus	57
3.9	List of endangered, critically endangered, and vulnerable plants of RIE	62
3.10	Medicinal plants observed on the RIE campus	63
3.11	Fauna of RIE Campus	75
Chapter 4		
4.1	Medicinal Plants or Trees	104

Chapter 1

Introduction

1.1 About the Institute

The Regional Institute of Education, Mysuru (Formerly Regional College of Education) founded on 1st August 1963, is one of five such institutions established by the National Council of Educational Research and Training (NCERT), New Delhi. The other Institutes are located in Ajmer, Bhopal, Bhubaneswar, and Shillong. The Regional Institutes was established to improve the quality of school instruction through creative pre-service and in-service teacher preparation programs, research programs, and extension initiatives.

The Regional Institute of Education in Mysuru has established an image for itself as a reputable institution for teacher and school education. The institute has made an effort to handle the obligations and problems brought on by changes in the country's and the southern region's educational scenario. The Institute has been functioning as the Regional Institute of Education since 1995, following a major shift in its focus from pre-service Education to in- service Education.

A Demonstration Multipurpose School (DMS) is attached to each RIE at Ajmer, Bhopal, Bhubaneswar, and Mysuru as a laboratory for trying out innovative practices in school Education and Teacher Education and trainees of the institutes.

Departments in the Institute

The Institute consists of four main departments:

1. Department of Education (DE)
2. Department of Education in Science and Mathematics (DESM)
3. Department of Education in Social Science and Humanities (DESSH)
4. Department of Extension Education (DEE)

Apart from the undergraduate and postgraduate courses, a higher secondary school called Demonstration school also works inside the campus which serves the institute to carry out innovative research in education and also helps prospective teachers to observe, learn and practice teaching.

1.2. Objectives of the Institute

Major Academic objectives of the Institute

- Designing and implementing innovative pre-service teacher training programs at various levels.
- Conducting continuing education/in-service training programs for capacity-building of the staff of DIETs, CTEs, IASEs and SCERTs, and other educational functionaries of the States/Union Territories in the region.
- Carrying out research and development activities in various areas of concern of school education and teacher education.
- Offering consultancy on matters related to school education as well as teacher education.
- Providing academic support in school education and teacher education to States and Union Territories in the region.
- Assisting in the implementation, monitoring, and evaluation of centrally sponsored schemes in the region.
- Assisting the States in the development, field testing, and evaluation of curriculum materials, textbooks, and instructional materials.

1.3. Courses offered

The pre-services courses of B.A.B.Ed, B.Sc.B.Ed, M.Sc.Ed, B.Ed, and M.Ed are offered to students who qualify for the Common Entrance Exam (CEE). Students have to apply online through www.cee.ncert.gov.in

Pre-service Courses

The institute currently offers the following programs. The maximum number of students accommodated in each course varies.

1. B.A.B.Ed: Four years integrated course in Social Science and Humanities (40 seats)
2. B.Sc.B.Ed: Four-year integrated course in Science and Mathematics. There are two streams for this course, Chemistry, Botany, Zoology (CBZ) stream and a Physics, Chemistry, Mathematics (PCM) Stream. (40+40=80 seats)
3. M.Sc.Ed: Six-year integrated course with specialization in Mathematics or Physics Chemistry (66 seats)
4. B.Ed: Bachelor of Education degree of two-year duration. (25(Humanities) + 25(Maths and Science)50 seats)
5. M.Ed: Masters in Education degree of two-year duration (30 seats)
6. DCGC: Diploma in guidance and counseling of one-year duration for teachers, teacher educators,and School administrators.
7. Ph.D.: The institute is a recognized research center of the University of Mysore. The institute offersPh.D. in science and education.

Online Courses

RIE Mysore offers the following online certificate course.

1. Certificate in Educational Research Methodology (CERM)
2. Certificate in Educational Program Evaluation (CEPE)
3. Certificate Course in School Librarianship (CCSL)

1.4. Campus Infrastructure and layout:

Fig 1.1: Campus layout Map

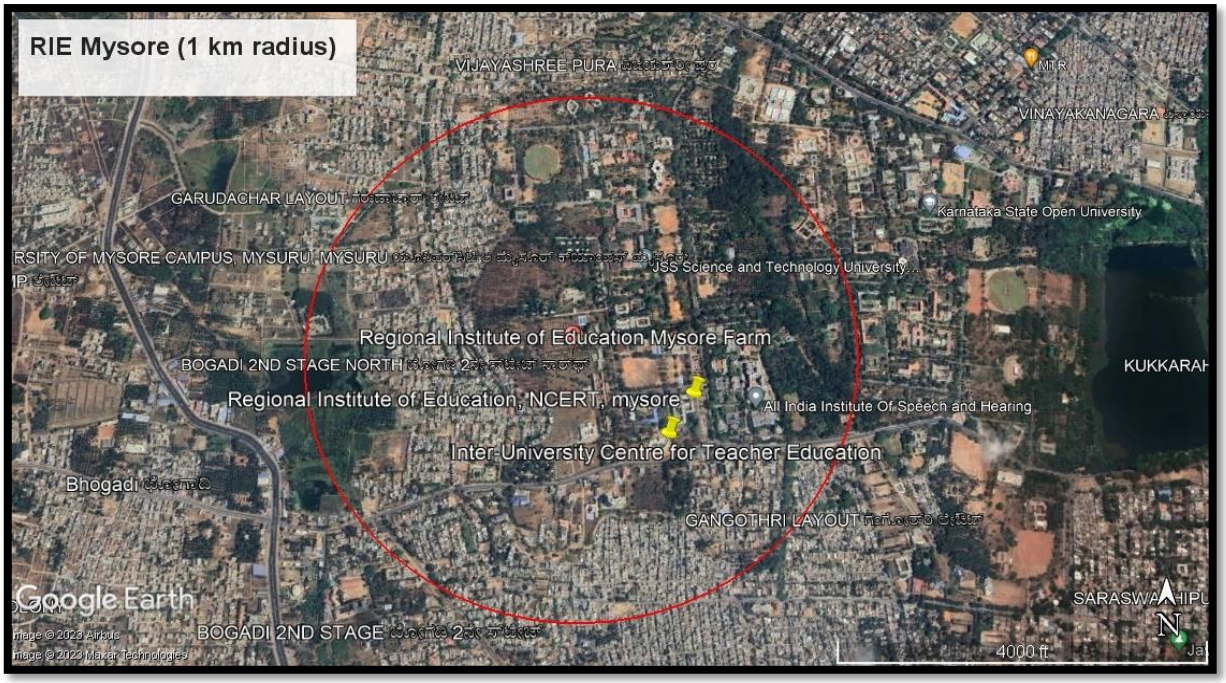


Fig 1.2: RIE Mysore around 1 km radius

RIE Campus has a landscape of 125 acres and 34 guntas (5, 05,997.96 sqm) with the following infrastructures:

1) Administrative Building – 97 Rooms

2) Technology Block – 47 Rooms

3) Tarka Kendra Block – 1942 sqm

4) Institute Library – 519 sqm

5) Demonstration School Pre-Primary Block – 736.33 sqm

6) Demonstration School Primary Block – 2306.61 sqm

7) Demonstration School High School Block – 3819.5 sqm

8) New Block with 5 Classrooms & 5 Faculty chambers – 9061.54 sqm

9) Ganga Hostel – 185 Rooms: 5072.46 sqm

10) Narmada Hostel – 62 + 1 Rooms: 2145.11 sqm

11) Saraswati Hostel – 75 Rooms: 3147.5 sqm

12) Krishna Hostel – 62 + 1 Rooms: 2145.11 sqm

13) Kaveri Hostel – 62 + 1 Rooms: 2145.11 sqm

14) Godavari Guest House – 12 Rooms: 492.38 sqm

15) Clinic /Dispensary – 204.38 sqm

16) Shopping Complex – 82.32 sqm

17) Institute Canteen – 229.28 sqm

18) Parking – 607.46 sqm

19) Staff Quarters (Type I – VI) – 101 Nos.

20) Playground – Football, Volleyball, Basketball, Tennis, Throw ball, Cricket practice Pitch:

21) Horticulture – Coconut, Mango, Tamarind, Sapota

22) Cattle sheds – 2

23) Rainwater harvesting system

24) Auditorium under construction

1.5. Land use data including build-up area and plantation area:

115.34 acres are used for building and plantation areas

Area-wise various buildings at Institute:

1) Administrative Building – 97 Rooms (45 on the Ground&on2the in the First floor): 2454.99sqm
2) Technology Block – 47Rooms: 1747.17 sqm
3) Tarka Kendra Block –1942 sqm
4) Institute Library–519 sqm
5) Demonstration School Pre-Primary Block –736.33 sqm
6) Demonstration School Primary Block – 2306.61sqm
7) Demonstration School High School Block –3819.5sqm
8) New Block with5 Classrooms &5 Faculty chambers– 9061.54 sqm
9) Ganga Hostel – 185 Rooms:5072.46 sqm
10) Narmada Hostel – 62+1Rooms:2145.11sqm
11) Saraswati Hostel–75 Rooms: 3147.5 sqm
12) Krishna Hostel –62 +1Rooms:2145.11 sqm
13) Kaveri Hostel –62+1 Rooms: 2145.11 sqm
14) Godavari Guest House–12 Rooms: 492.38 sqm
15) Clinic /Dispensary– 204.38 sqm
16) Shopping Complex–82.32sqm
17) Institute Canteen –229.28sqm (recently not working)
18) Parking– 607.46 sqm
19) **Staff Quarters (Type I–VI) – 101 Nos.**
    i) Type I–14Nos.
    ii) Type II–38Nos.
    iii) Type III–24 Nos.

iv) Type IV–12Nos.

v) Type V–12Nos.

vi) Type VI– 1No.

20) Playground–

i) Football playground:

ii) Volleyball Court:

iii) Basketball Court:

iv) Tennis Court:

v) Throw ball Court:

vi) Cricket practice Pitch:

21) Horticulture–Coconut, Mango, Tamarind, Sapota

22) Cattle shed–2

23) Rainwater harvesting system

24) Auditorium under construction

21) Laboratories

The institute offers courses in various aspects of science and education. It is equipped with several laboratories for different subjects, apart from that it also has a state-of-the-art computer lab

List of laboratories

1. Physics - 5 labs
2. Chemistry - 9 labs
3. Botany - 2 labs
4. Zoology - 2 labs
5. Mathematics - 1 lab
6. Computer - 4 labs
7. Geography -1 lab
8. Language -1 lab
9. Psychology laboratory and Physical Science/Biological Science methods laboratory - 1 lab

10. Language Laboratory - 1 lab with 20 consoles

11. E-learning Lab - 4 lab Library

22) Library

In the institute library, there are more than 70,000 books on different subjects. In addition to books, the library also has M.Ed. dissertations, Ph.D. theses, all of the institute's internal publications, and several NCERT publications. The library uses open-source automation tools and is fully automated. Additionally, it makes use of an online public access catalog (OPAC).

Library Collections

Total Number of Books –70,000

Number of Back Volumes Journals – 6000

Total Number of Journals – 104

Indian Journal – 51

Foreign Journal – 20

Gift Journal – 33

Number of News Paper – 12

Number of Magazines – 12

23) Other Facilities

The institute also has a science park, Botany, and Zoology Museum of specimens. It has two EDUSAT terminals, a branch of SBI Bank, four conference rooms, and a health clinic with two resident doctors.

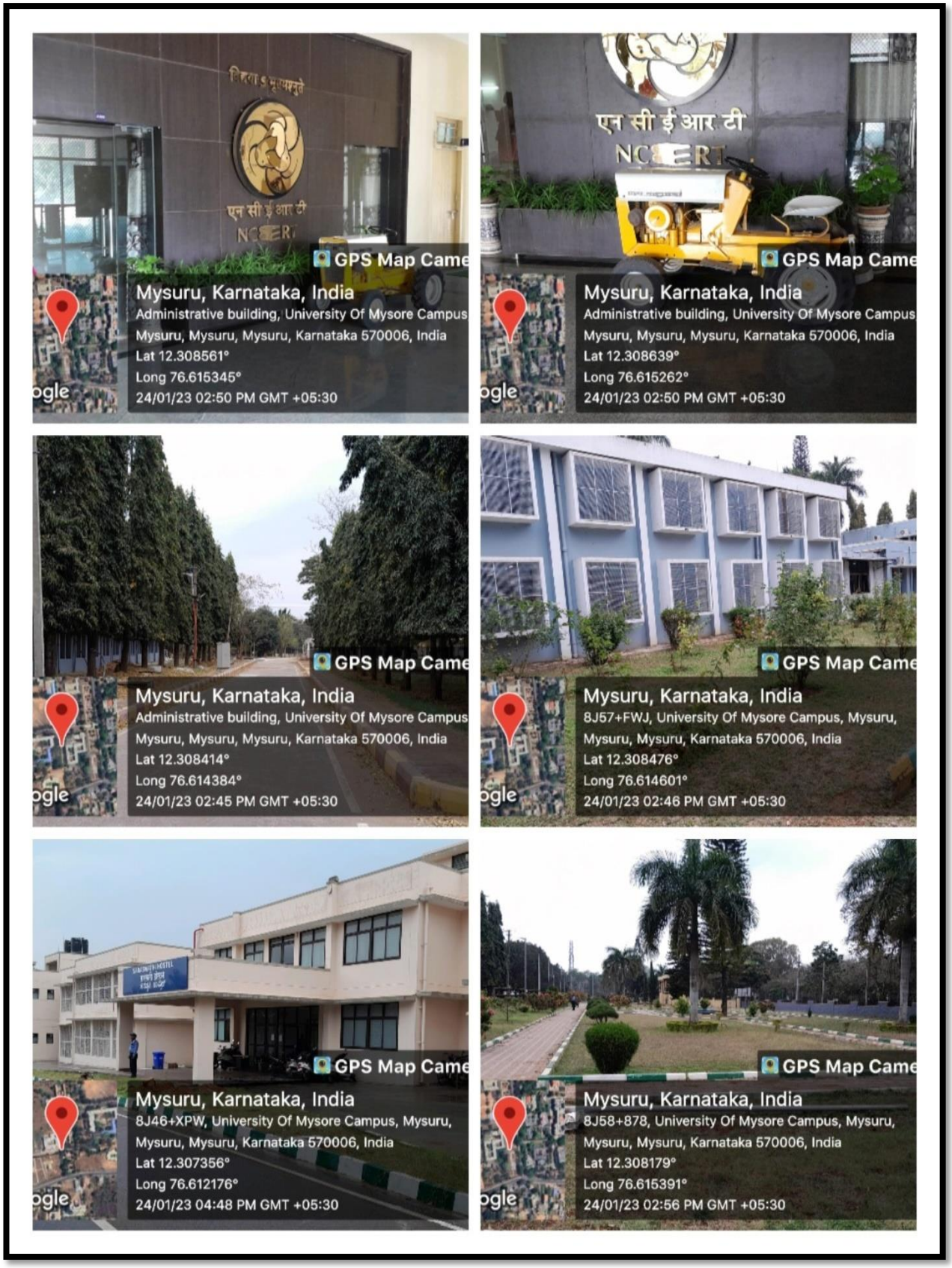


Fig 1.3: RIE Campus View

Fig 1.4: Girls Hostels (Ganga, Narmada, and Saraswati)

Fig 1.5: Boys Hostels (Kaveri and Krishna)

Fig 1.6: Science Park

Fig 1.7: Library of RIE

Fig 1.8: Old Books Library of RIE

Fig 1.9: Chemistry Laboratory of RIE

Fig 1.10: Health Clinic of RIE

Fig 1.11: The dining room of the girl'shostel of RIE

Chapter 2

Pre-Audit Stage

2.1. Scope and Goals of Green Audit

An environment that is clean and healthy promotes learning and is conducive to learning. Several initiatives are being made worldwide to address the problems with environmental education. A green audit is the most effective and sustainable method of handling environmental issues. It is a type of professional care that each person who is a component of an economic, financial, social, or environmental aspect is responsible for. Doing a green audit on college and institute campuses is essential because it raises students' awareness of the benefits of doing so for the environment and helps them develop into responsible citizens. As a result, green auditing is required at the institute and college levels.

2.2. Benefits of Green Audit

- Improved resource management
- To provide the basis for improved sustainability
- To create a green campus

- Identify ways to reduce costs by managing and decreasing waste
- To create a plastic-free campus and evolve health consciousness: Recognize the cost-saving methods through waste minimizing and managing
- Identify the current and upcoming complications: Verify compliance with the laws in effect.
- Offer organizations the tools they need to design greater environmental performance: Enhance awareness of environmental obligations and guidelines
- Promote environmental awareness by using a systematic approach to environmental management and raising environmental standards.
- Setting benchmarks for environmental protection measures
- Reducing resource usage to save cost
- Developing social and personal responsibility for the institution and its surroundings
- Improvement of institute profile
- Evolving an environmental ethic and value systems in youngsters
- Green auditing should become a vital tool in the management and monitoring of environmental and sustainable development activities of the institute

2.3. Target Areas of Green Audit

A process for resource management includes a green audit. The actual value of green audits lies in the fact that they are conducted at predetermined intervals and that the results might show improvement or change over time, even though the fact that they are individual events. The eco-campus idea primarily emphasizes the effective use of water and energy to reduce waste production or pollution and maximize economic efficiency. All of these factors are evaluated as part of the educational institution's green audit procedure. Eco-campus prioritizes the reduction of emissions, secures a cost-effective and reliable energy supply, promotes personal responsibility, increases energy efficiency, lowers institute consumption of water and energy, lessens waste sent to landfills, and incorporates environmental concerns into all agreements and services deemed to have a significant environmental impact. Water, energy, waste, air, and noise of the green campus are the focus areas of this green audit.

2.3.1 Audit of Water Management

Water is a natural resource that is essential to all living things. While freely accessible in many natural settings, potable water is less easily accessible in urban areas. To guarantee that everyone has access to drinkable water both now and in the future, we must utilize water responsibly. More than 180 litres of water can be lost daily from a little drip from a leaking tap; that is a lot of water to lose—eight toilet flushes' worth. Water pollution and aquifer depletion are occurring at completely unheard rates. So, it is crucial that any organization that cares about the environment evaluate its methods for using water. Water auditing is done to assess raw water intake facilities and identify facilities for water treatment and reuse. The concerned auditor examines the appropriate approach that may be used to balance the supply and demand for water. Any institution that cares about the environment must therefore examine its water usage procedures.

2.3.2. Audit of Energy Management

Although energy cannot be seen, we know it exists because we can observe its effects, such as heat, light, and power. Energy use, energy sources, energy monitoring, lighting, appliances, and automobiles are all included in this indication. Electricity use is undoubtedly a crucial component of campus sustainability, thus its inclusion in the assessment doesn't call for any justification. Energy auditing focuses on ways to conserve energy and reduce spending on using that could lead to environmental damage. So, it is crucial that any institution that cares about the environment evaluate its methods for using energy.

2.3.3. Audit for Waste Management

Pollution from waste causes a lot of litter in our communities, which can harm our well-being and is unpleasant. For birds and other animals, plastic bags and discarded ropes and strings can be quite deadly. This indicator includes waste generation and disposal, recycling, and waste of plastic, paper, and food. General waste and hazardous waste are the two categories into which solid waste can be separated. General wastes comprise items that are typically thrown out in households and schools, such as garbage, paper, cans, and glass bottles. Waste that poses a risk to human health or the environment, such as gasoline and cleaning products, is referred to as hazardous

waste. Unscientific landfills could contain dangerous chemicals that seep into the ground and water systems and emit greenhouse gases that contribute to global warming.

Moreover, solid waste frequently contains unused materials that may be recycled, repaired, or reused to provide better services. So, a sustainable college must reduce its solid waste output. The auditor diagnoses the current waste disposal practices and makes recommendations for the most effective solutions to the issues. Therefore, it is crucial that any institution that cares about the environment analyze its waste management procedures.

2.3.4. Audit of Green Campus Management

The loss of habitat, pollution, over-consumption, and invasive species are, unfortunately, severe threats to biodiversity. The alarming rate of species extinction has an impact on both the delicate balance of nature and human quality of life. Without this diversity among living things, ecological systems and processes would fail, which would have negative effects on all types of life, including humans. Both newly planted and old trees reduce the atmospheric concentration of carbon dioxide. In addition to supporting better public health and enhancing cities' aesthetics, trees have a significant ecological impact on urban environments. A single mature tree may remove as much as 48 pounds (4.535 x 10-3 tonnes) of carbon dioxide from the atmosphere in a year and release it as oxygen. One tree produces enough oxygen to meet human needs for one day. Hence, all the trees on campus are working hard to make the air better for us while you are busy studying and working to obtain those good scores. Trees can also affect one's mental health. Studies have shown that trees significantly lower stress, which a big deal is given that many students experience some level of stress.

2.4. Methodology

The purpose of the audit was to ensure that the practices followed on the campus are by the Green Policy adopted by the institution. The criteria, methods, and recommendations used in the audit were based on the identified risks. The methodology comprises preparing and filling out a questionnaire, physically inspecting the campus, watching and reviewing the document, interacting with the people who are responsible, analyzing the data, taking measurements, and making recommendations. The three-step methodology used for this audit consisted of:

1. Data Collection
2. Data Analysis
3. Recommendations and Management Plans

2.4.1 Data Collection

In the preliminary data collection phase, exhaustive data collection was performed using different tools such as observation, survey communication with responsible persons, and measurements. The following steps were taken for data collection:

- The team went to each department, center, Library, canteen, etc.
- Data about the general information was collected by observation and interview.

2.4.2. Data Analysis and Recommendations

Based on data analysis findings and observation results, some recommendations for reducing electricity and water use were suggested. The proper management of waste was also recommended. For the sake of community health, fossil fuel use must be decreased. A questionnaire was used to examine the above target areas that are specific to the institution. Five categories of questionnaires were distributed which are given in pre-audit questionnaires.

2.4.3. Pre Audit Questionnaires

The major pre-audit questionnaires are based on the following topics:

1. Water
2. Energy
3. Waste
4. Green Campus

Other is Air, noise, and ecology (flora and fauna) of RIE.

Questionnaires

1. List the uses of water in the Institute.
2. What are the sources of water in the Institute?
3. How does your Institute store water?
4. If there is water wastage, specify why.
5. How can the wastage be prevented/stopped?

6. What are the uses of wastewater in the Institute?
7. What happens to the water used in your labs? Whether it gets mixed with groundwater?
8. The number of water coolers?
9. The number of water taps?
10. The number of bathrooms in staff rooms, common, hostels?
11. The number of toilets, and urinals?
12. Does your institute harvest rainwater?
13. Is there any water management plan in the institute?
14. Are there any water-saving techniques followed in your institutes? What are they?
15. List the usage of energy in the institute. (Electricity, electric stove, kettle, microwave, LPG, fire-wood, Petrol, diesel, and others).
16. Electricity bill
17. Is there a generator facility in the Institute?
18. How many CFL bulbs have the Institute installed?
19. How many tube lights and fans are installed in the Institute?
20. How many air conditioners are installed in the Institute?
21. How much electrical equipment including weighing balance is installed in the Institute? Mention the use (Hours used/day for how many days in a month)
22. How many TV, CCTV, and computers are there in the institute?
23. Which of the following are found near your Institute? Municipal dump yard, Garbage heap, Public convenience, Sewer line, Stagnant water, Open drainage, Industry – (Mention the type), Bus / Railway station, Market / Shopping complex / Public halls
24. Does your Institute generate any waste? (E-waste, Hazardous waste (toxic), Solid waste, Dry leaves, Canteen waste, Liquid waste, Glass, Unused equipment, Medical waste if any, Napkins, Others (Specify)
25. Is there any waste treatment system in the Institute?
26. How is the waste generated in the Institute managed by composting, recycling, reusing, or other methods?
27. Do you use recycled paper in Institute?
28. Is there a garden in the Institute?
29. Do students spend time in the garden?

30. List the numbers of each plant species in the garden.
31. List the species planted by the students, with numbers.
32. Whether you have displayed the scientific names of the trees on the campus?
33. Is there any plantation on your campus? If yes specify the area and type of plantation.
34. Is there any medicinal garden in the Institute? If yes how much area?
35. Who is in charge of the gardens in your Institute?
36. Are you using any type of recycled water in your garden?
37. Do you have any composting pits in the institute?
38. What do you doing with the vegetables harvested?
39. Is there any botanical garden on your campus? If yes give details of campus flora.
40. Give the number and names of the medicinal plants on the campus of the institute.
41. Have any threatened plant species been planted/conserved?
42. What is the type of vegetation in the surrounding area of the Institute?
43. Is there any nature awareness program conducted on campus?
44. What is the involvement of students in green cover maintenance?
45. What is the total area of the campus under tree cover? Or under a tree canopy?
46. Total Number of vehicles used by the students of the institute.
47. Mention the usage of cycles, two-wheelers, and cars.
48. The number of persons using common transportation?
49. The number of visitors with vehicles per day?
50. The number of generators used per day (hours)? Give the amount of fuel used per day.
51. Suggest the methods to reduce the quantity of use of fuel used by the students/teacher non -teaching staff of the college

Chapter 3

Post-Audit Stage

3.1. Post-Audit Stage

Any green audit must have proof that supports its conclusions in the form of records and facts that can be independently verified. To make sure that past actions, activities, events, and procedures are carried out correctly and by system requirements, the audit process aims to track past actions, activities, events, and procedures periodically. Green audits are a step in the process. The actual usefulness of green audits lies in the fact that they are conducted at predetermined intervals and that the results might show improvement or change over time, despite the fact. There is always some amount of subjectivity in an audit, even when policies, processes, documented systems, and objectives are used as a test in green audits.The goal of any green audit is to evaluate the efficiency of the environmental equipment and management. Each of these elements is essential to ensuring that the campus' environmental performance reaches the targets specified in its green strategy. The degree of success or failure of the campus environmental performance will depend on how well each individual is operating and how well integration goes.

3.2. Observation

3.2.1. Water

1. List the uses of water in the Institute.

Water pipelines are connected to all the buildings, Offices, Schools, Laboratories, hostels, quarters, and gardens. Water supply is from 6 bore wells, 1 Overhead tank – 30,000 gallons (1.14 Liters,) and 1 RO water plant.

2. What are the sources of water in the Institute?

The sources of water in the Institute are from 1) 6 Bore wells, 2) a Cauvery water supply from City Municipal, and3) a Rainwater harvesting system.

3. How does your Institute store water?

Water from bore wells and Cauvery supply are stored in 1) a big Sump then supplied to the overhead tank–30,000gallons, which is supplied for all uses. There are small sumps of 50,000 L in each hostel and a medium sump of 1, 00,000L in the Ganga hostel. The Rainwater is harvested in1, 00,000 L sump in the playground and 50,000L sump in Technology Block.

4. If there is water wastage, specify why

No wastage

5. How can the wastage be prevented/stopped?

A sufficient storage system prevents wastage.

6. What are the uses of waste water in the Institute?

In case of excess, it is used for gardening

7. What happen to the water used in your labs? Whether it gets mixed with groundwater?

Lab water is drained into the drainage, without mixing with the groundwater

8. The number of water coolers

RO drinking water plant–1,supplied to all offices, schools, hostels, and all blocks.

9. The number of water taps?

2,500watertaps (Water taps are not low flow)

10. The number of bathrooms in staff rooms, common

20bathrooms

11. The number of a toilet and urinals?

20toilets

12. Does your institute harvest rainwater?

Yes

13. Is there any water management plan in the institute?

Yes, there are water-collecting sumps in every hostel. There is one main large Sump, a small sump of 50,000 L in each hostel, a sump of 1, 00,000 L in the Ganga hostel, an overhead tank–30,000-gallon

Rainwaterisharvestedin1,00,000Lsumpintheplayground&50,000Lsump in Technology Block. – (Photograph of rainwater harvesting points been as given)

14. Are there any water saving techniques followed in your institutes? What are they?

Rainwater harvesting

3.2.2. Energy

1. List the usage of energy in the institute (Electricity, electric stove, kettle, microwave, LPG, fire-wood, Petrol, diesel, and others).

1) Electricity supply from KPTCL (Karnataka Power Transmission Corporation Limited).
2) LPG is used in hostels and Labs
3) Petrol is used for machines in trimming grasses
4) Diesel is used for generator
5) Solar heater used for water heating purposes in the hostels-

2. Electricity bill– ₹ 5L–₹ 6Lper month(65000 KW/per month)

3. Is there a generator facility in the Institute?

Yes, there is one Generator of 250 KVa

4. How many CFL bulbs has the Institute installed? –

150CFLbulbs (80% are the CFL bulbs used out of total bulbs)

5. How many tube lights, fans are installed in the Institute?

1354 tube lights & 779fans

6. How many air conditioners are installed in the Institute?

84airconditioners (3 star rated air conditioners were installed)

7. Howmuchelectricalequipment'sincludingweighingbalanceareinstalledintheInstitute? Mention the use (Hours used/day for how many days in a month).

There are 10 Electric weighing balance machines, used for weighing parcels, chemicals, and lab materials as and when required.

8. How many TV, CCTV and computers are there in the institute?–

108 TVs, 159 CCTVs & 593 Computers

3.2.3. Waste

1. **Which of the following are found near your Institute?**

   Municipal dump yard, Garbage heap, Public convenience, Sewer line - 1, Stagnant water, Open drainage, Industry – (Mention the type), Bus / Railway station, Market / Shopping complex/ Public halls. Garbage heap, sewer line, and shopping complex are found near the campus.

2. **Does your Institute generate any waste? (E-waste, Hazardous waste (toxic), Solid waste, Dry leaves, Canteen waste, Liquid waste, Glass, Unused equipment, Medical waste if any, Napkins, Others (Specify)):**

   Yes, E waste, Lab waste, Solid waste, Dry leaves, Canteen waste, Liquid waste, Glass, Unused equipment, and Napkins. E wastes are kept were one room, and dry leaves and canteen wastes are managed by composting, solid waste, and glassware are managed by daily local bodies. At present, there is no specific practice for plastic waste management.

3. **Is there any waste treatment system in the Institute?**

   Planning for incineration

4. **How is the waste generated in the Institute managed, by composting or recycling or reusing or by other methods?**

   Vermicomposting (capacity 10 tons), cow dung, dry leaves

5. **Do you use recycled paper in Institute?**

   No.

6. **How you manage the waste papers?**

   The waste papers have been sold as a raddi.

3.2.4. Green Campus

1. Is there a garden in the Institute?

Yes, there are rose gardens in front of the library, the School lawn, in front of the lawn, the Office Quadrangle, Biodiversity Park, the Science Park, Tarka Kendra, yoga Kendra, Godavari Guest house&1 in the Nursery. The total RIE campus is spread over 120 acres of area. Out of these three forth portion of the land is under

green cover approximately.

2. Do students spend time in the garden?

Yes, students spend time in the evening and morning for recreation andrefresh.Studentscleanthecampusunderthenationalinitiative/movement, "*Azadi Ka Amrit Mahotsav*" by collecting plastic and other pollutants. They also help in cleaning and watering the plants. The students are very well aware of the fact that plants help in pollution attenuation. So they conduct the plantation activity in the institute every year. They are aware of the Sericulture, Apiculture, and Lac cultures as well.

3. List the numbers of each plant species in the garden.

i. Rose
ii. Croton
iii. Palm
iv. *Dracaena fragrans*
v. Grass garden
vi. Saplera
vii. Coconut
viii. Mango
ix. Sapota
x. Jamun
xi. Tamarind
xii. Jackfruit
xiii. Papaya
xiv. Sampige

4. List the species planted by the students, with numbers.

Students have planted Coconut– 20 plants, Jamun– 10 plants &Mango–5plants

5. Whether you have displayed the scientific names of the trees on the campus?

Yes, mostly displayed.

6. Is there any plantation in your campus? If yes specify the area and type of plantation.

Yes. Narmada Hostel back–Mango mallika, KrishnaHostelback–Mango Badami, Kaveri Hostel surrounding– Coconut, Jamun &Guava

7. Is there any medicinal garden in the Institute? If yes how much area?

Yes, it is inside the Biodiversity Park – 100x100 sq.ft.

8. Who is in-charge of gardens in your institute

Dr. V. Prasad, In charge, Agriculture Section

9. Are you using any type of recycled water in your garden?

Yes, Narmada and Krishna hostel gardens are managed with recycled water.

10. Do you have any composting pits in the institute?

Yes, Nursery pit and green house pit.

11. What do you do with the vegetables harvested?

Vegetables harvested from the school gardens are distributed to school students.

12. Is there any botanical garden on your campus? If yes give details of campus flora.

Yes, it is located adjacent to the botany department, near the Biodiversity Park. There are many floral species belonging to bryophytes, pteridophytes, and gymnosperms on the campus. (Detail document is found in the book, "Biodiversity of RIE Mysore Campus– A Manual" published in 2014).

13. Give the number and names of the medicinal plants on campus of the institute.

List of the medicinal plants found in the campus with their uses is reported in PAC 18.33 (2018), pages 18 –20. Some of them are listed here:

i. Tulsi: Holy basil (*Ocimum tenuiflorum*), flowering plant of the mint (Family:Lamiaceae)

ii. Doddapatre: *Coleus amboinicus*, is a semi-succulent perennial plant(Family:Lamiaceae)Commonnames:Indianborage,countryborage,Indianmint,Mexican mint

iii. Aloe vera (Family Asphosdelaceae)

iv. Amla: Indian gooseberry–*Phyllanthus emblica* (Family: Phyllanthaceae)

v. Curry Leaf: *Murraya koenigii* (Family Rutaceae)

14. Any threatened plant species been planted/conserved?

Khus Grass (Vetiveriazizanioides),

Guduchi–*Tinospora cordifolia* (Menispermaceae)

15. What is the type of vegetation in the surrounding area of the Institute?

Scrub jungle behind the campus, Mango trees, Jamun fruit, Eucalyptus, Teak trees around the campus.

16. Is there any nature awareness program conducted in the campus?

Yes, Eco-warriors, Environmental Education activities are conducted for both DMS and RIE students.

17. What is the involvement of students in green cover maintenance?

There is a green initiative student club called Eco-warriors, and students are involved in the tree plantation programs, name plate preparations, and in watering the plants.

18. What is the total area of the campus under tree cover or under tree canopy?

About 40 acre of the campus is under tree covers. Out of 120 acres of land 40 acres (33%) of land is under tree cover.

3.2.5. Use of Vehicles

1. Total Number of vehicles used by the students of the institute.

RIE – 1 Jeep for students, 1 Principal's car, 1 Tractor for farming 31cycles, 27 two-wheelers and 25 cars

DMS– 857 students

ModeoftransportationofstudentsfromNurserytograde12ofDemonstrationSchool, Mysuru are as follows:

1. Cycle-82
2. Two-wheelers-06
3. Parent drop:
   A. Two wheelers -295
   B. Fourwheelers-08
4. Private transportation (van/auto/ bus) -426
5. Bywalking-40

(Totalofall857)

2. Mention the usage of cycles, two wheelers and cars.

For attending classes

3. The number of persons using common transportation

426 Students use common transportation

4. The number of visitors with vehicles per day

20 – 30 vehicles per day

5. Number of generators used per day (hours). Give the amount of fuel used per day.

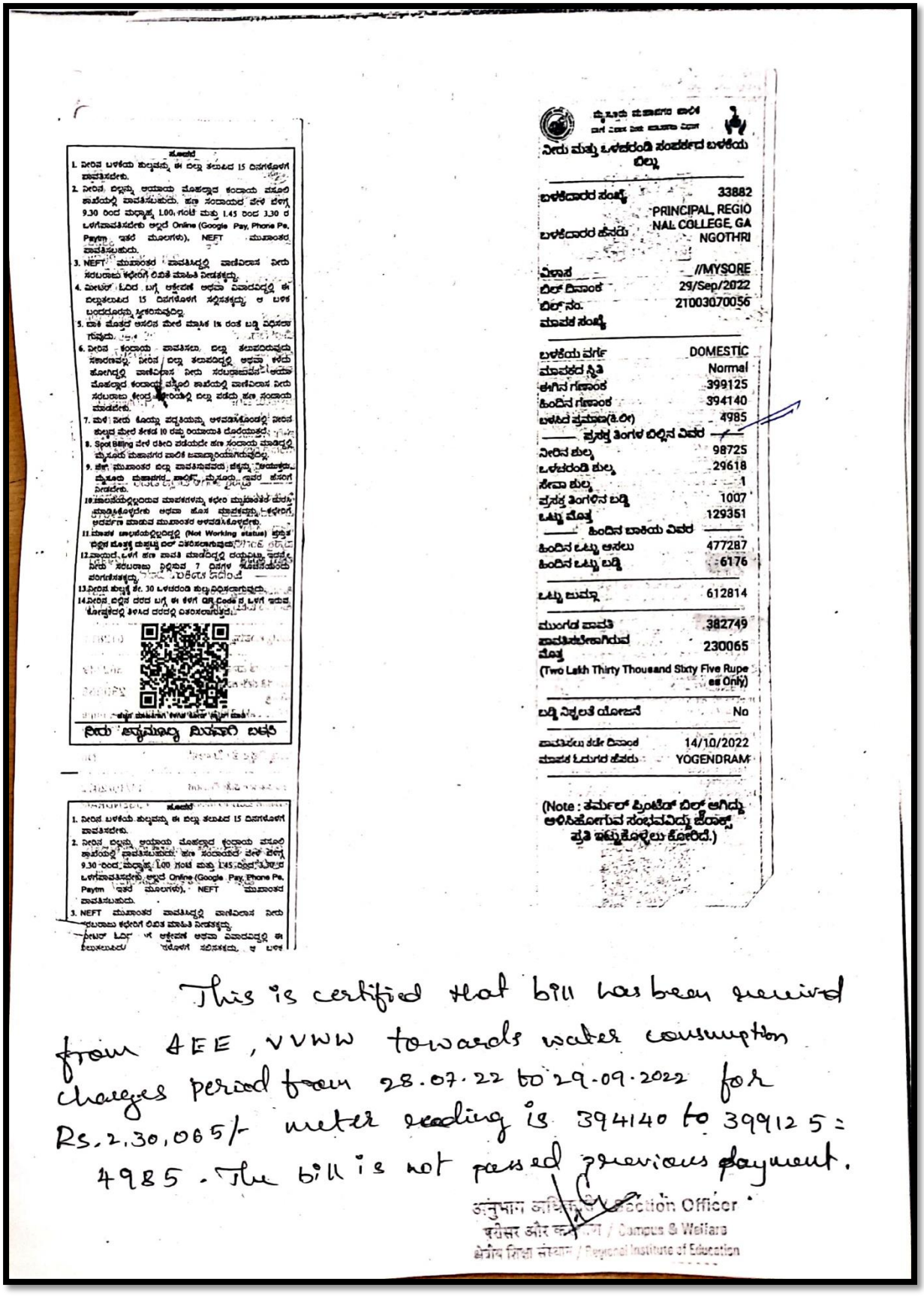
1Generator of 250 KVa, used 2 or 3 times a week. 200–300L of Diesel is used per-month (6-10Lof Diesel per day)

6. Any plans to reduce the quantity of use of fuel used by the staff of the institute.

There is planning for use of solar panels for energy conservation.

7. Weather parking area is close to the main college building and is having green vegetation around it?

Yes, the parking area is surrounded by green vegetation.



ನೀರು ಮತ್ತು ಒಳಚರಂಡಿ ಸಂಪರ್ಕದ ಬಳಕೆಯ ಬಿಲ್ಲು

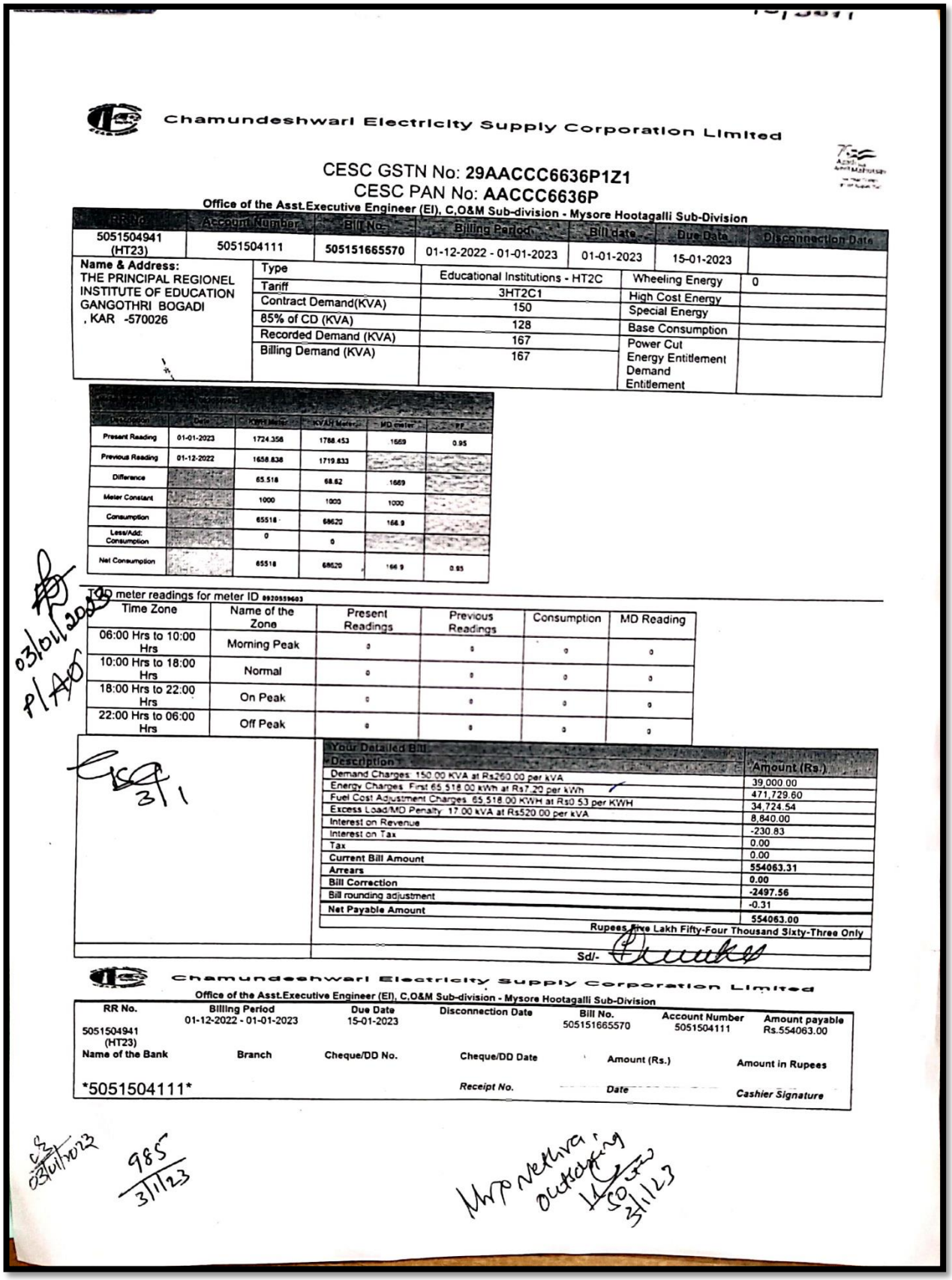
ಬಳಕೆದಾರರ ಸಂಖ್ಯೆ	33882
ಬಳಕೆದಾರರ ಹೆಸರು	PRINCIPAL, REGIONAL COLLEGE, GANGOTHRI
ವಿಳಾಸ	//MYSORE
ಬಿಲ್ ದಿನಾಂಕ	29/Sep/2022
ಬಿಲ್ ನಂ.	21003070056
ಮಾಪಕ ಸಂಖ್ಯೆ	
ಬಳಕೆಯ ವರ್ಗ	DOMESTIC
ಮಾಪಕದ ಸ್ಥಿತಿ	Normal
ಈಗಿನ ಗಣಾಂಕ	399125
ಹಿಂದಿನ ಗಣಾಂಕ	394140
ಬಳಸಿದ ಪ್ರಮಾಣ(ಕಿ.ಲೀ)	4985
ಪ್ರಸಕ್ತ ತಿಂಗಳ ಬಿಲ್ಲಿನ ವಿವರ	
ನೀರಿನ ಶುಲ್ಕ	98725
ಒಳಚರಂಡಿ ಶುಲ್ಕ	29618
ಸೇವಾ ಶುಲ್ಕ	1
ಪ್ರಸಕ್ತ ತಿಂಗಳಿನ ಬಡ್ಡಿ	1007
ಒಟ್ಟು ಮೊತ್ತ	129351
ಹಿಂದಿನ ಬಾಕಿಯ ವಿವರ	
ಹಿಂದಿನ ಒಟ್ಟು ಅಸಲು	477287
ಹಿಂದಿನ ಒಟ್ಟು ಬಡ್ಡಿ	6176
ಒಟ್ಟು ಜುಮ್ಮಾ	612814
ಮುಂಗಡ ಪಾವತಿ	382749
ಪಾವತಿಸಬೇಕಾಗಿರುವ ಮೊತ್ತ	230065
(Two Lakh Thirty Thousand Sixty Five Rupees Only)	
ಬಡ್ಡಿ ನಿಷ್ಕಲತೆ ಯೋಜನೆ	No
ಪಾವತಿಸಲು ಕಡೆ ದಿನಾಂಕ	14/10/2022
ಮಾಪಕ ಓದುಗರ ಹೆಸರು	YOGENDRAM

(Note : ತರ್ಮಲ್ ಪ್ರಿಂಟೆಡ್ ಬಿಲ್ ಆಗಿದ್ದು ಅಳಿಸಿಹೋಗುವ ಸಂಭವವಿದ್ದು ಜೆರಾಕ್ಸ್ ಪ್ರತಿ ಇಟ್ಟುಕೊಳ್ಳಲು ಕೋರಿದೆ.)

This is certified that bill was been received from AEE, VVWW towards water consumption charges period from 28.07.22 to 29.09.2022 for Rs. 2,30,065/- meter reading is 394140 to 399125 = 4985. The bill is not passed previous payment.

Section Officer
Campus & Welfare
Regional Institute of Education

Fig 3.1: Water Bill



Chamundeshwari Electricity Supply Corporation Limited

CESC GSTN No: **29AACCC6636P1Z1**
CESC PAN No: **AACCC6636P**

Office of the Asst.Executive Engineer (EI), C,O&M Sub-division - Mysore Hootagalli Sub-Division

RR No.	Account Number	Bill No.	Billing Period	Bill date	Due Date	Disconnection Date
5051504941 (HT23)	5051504111	505151665570	01-12-2022 - 01-01-2023	01-01-2023	15-01-2023	

Name & Address:
THE PRINCIPAL REGIONEL INSTITUTE OF EDUCATION GANGOTHRI BOGADI , KAR -570026

Type	Educational Institutions - HT2C	Wheeling Energy	0
Tariff	3HT2C1	High Cost Energy	
Contract Demand(KVA)	150	Special Energy	
85% of CD (KVA)	128	Base Consumption	
Recorded Demand (KVA)	167	Power Cut Energy Entitlement	
Billing Demand (KVA)	167	Demand Entitlement	

Description	Date	Kwh Meter	KVAH Meter	MD meter	PF
Present Reading	01-01-2023	1724.356	1788.453	1669	0.95
Previous Reading	01-12-2022	1658.838	1719.833		
Difference		65.518	68.62	1669	
Meter Constant		1000	1000	1000	
Consumption		65518	68620	166.9	
Less/Add: Consumption		0	0		
Net Consumption		65518	68620	166.9	0.95

TOD meter readings for meter ID 0920559603

Time Zone	Name of the Zone	Present Readings	Previous Readings	Consumption	MD Reading
06:00 Hrs to 10:00 Hrs	Morning Peak	0	0	0	0
10:00 Hrs to 18:00 Hrs	Normal	0	0	0	0
18:00 Hrs to 22:00 Hrs	On Peak	0	0	0	0
22:00 Hrs to 06:00 Hrs	Off Peak	0	0	0	0

Your Detailed Bill Description	Amount (Rs.)
Demand Charges: 150.00 KVA at Rs260.00 per kVA	39,000.00
Energy Charges: First 65,518.00 kWh at Rs7.20 per kWh	471,729.60
Fuel Cost Adjustment Charges: 65,518.00 KWH at Rs0.53 per KWH	34,724.54
Excess Load/MD Penalty: 17.00 kVA at Rs520.00 per kVA	8,840.00
Interest on Revenue	-230.83
Interest on Tax	0.00
Tax	0.00
Current Bill Amount	554063.31
Arrears	0.00
Bill Correction	-2497.56
Bill rounding adjustment	-0.31
Net Payable Amount	554063.00

Rupees Five Lakh Fifty-Four Thousand Sixty-Three Only

Sd/-

Chamundeshwari Electricity Supply Corporation Limited

Office of the Asst.Executive Engineer (EI), C,O&M Sub-division - Mysore Hootagalli Sub-Division

RR No.	Billing Period	Due Date	Disconnection Date	Bill No.	Account Number	Amount payable
5051504941 (HT23)	01-12-2022 - 01-01-2023	15-01-2023		505151665570	5051504111	Rs.554063.00

Name of the Bank	Branch	Cheque/DD No.	Cheque/DD Date	Amount (Rs.)	Amount in Rupees
5051504111			Receipt No.	Date	Cashier Signature

Fig 3.2: Electricity Bill

3.3.Major Audit Observations

- The institute was very well-developed greenery inside the campus.
- The air quality inside the campus was moderate.
- The noise levels inside the campus were moderate during the peak hours only.
- The environmental awareness initiatives need to be improved with respect to waste management.
- Vegetable cultivation and composting were observed.
- Green initiative programs need to be strengthened. Campuses should have strict rules on plastic-free zones.
- Programs for environmental education, solar power generation, and rainwater harvesting need to be strengthened.
- The sanitary waste disposal system in the girl's hostel was non-functional, which needs to be materialized.

3.3.1. Water Audit

- The institute has two rainwater harvesting points, where the rainwater was collected and supplied to the gardens (Fig 3.3).
- A dedicated person is required for leak detection on campus.
- The source of drinking water on the campus is supplied by the municipal corporation. The biggest source of drinking water at Mysuru is the Cauvery River.
- The wastewater from the mess is being directly allowed to flow into the Mango garden.
- The wastewater/sewage water from the offices and the hostels are connected to the municipal drainage lines.

3.3.2. Energy Audit

- It has been observed that the awareness-raising procedure for energy conservation was insufficient.
- It is important to set goals for reducing fuel, water, and energy usage.

- New energy-efficient equipment's to be used in place of outdated models and inefficient models.
- The campus has implemented regular equipment monitoring and quick problem-solving.
- A lack of manpower was noticed in the Energy section.
- There are solar heaters present on the rooftop of hostels.

3.3.3. Waste Audit

- Solid waste management methods are to be maintained.
- The college was a proper connection with the local body for routine collection of solid waste from the campus.
- E wastes were stored in one room.
- Dry leaves and canteen wastes were managed by composting.
- The old newspapers and files were sold as a Raddi.
- Waste bins in the classrooms, veranda, canteen, and campus were inadequate.
- There was no separation of wet and dry waste. Both wastes are thrown in a single bin.
- Proper composting systems are to be established.

Table 3.1: Different Wastes Disposal Method

Types of waste	**Particulars**	**Disposal method**
E-Waste	Computers, electrical and electronic parts	Store in one room
Plastic waste	Pen, Refill, Plastic water bottles and other plastic containers, wrappers, etc.	Collection by local bodies
Solid wastes	paper waste, paper plates, food wastes	Composting
Chemical wastes	Laboratory waste	Neutralize with water
Wastewater	Washing, urinals, bathrooms	Used for gardening

Glass waste	Broken glass wares from the labs	Direct selling
Sanitary Napkin	Napkin	Incinerators with a capacity of 500 to 1000 napkins at a time

3.4.Weather of Mysore

3.4.1. Weather Data of Mysore

The city of Mysore, which is located at an altitude of 742.98 meters (2437.6 feet) above sea level, has a tropical wet and dry climate or savanna climate (Classification: Aw). The district's average annual temperature is 1.07% higher than India's average at 27.04ºC (80.67ºF). Mysore typically receives 140.02 millimeters (5.51 inches) of precipitation annually and experiences 179.64 rainy days (or 49.22% of the time). (https://www.accuweather.com/en/in/mysore/204111/weather-forecast/204111)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C *-(°F)	34.0 (93.2)	38.0 (100.4)	41.0 (105.8)	43.0 (109.4)	41.0 (105.8)	36.0 (96.8)	33.0 (91.4)	34.0 (93.2)	35.0 (95.0)	36.0 (96.8)	33.0 (91.4)	33.0 (91.4)	43.0 (109.4)
Average high °C (°F)	29.87 (85.77)	32.63 (90.73)	34.87 (94.77)	36.12 97.02)	34.44 (93.99)	29.72 (85.5)	28.57 (89.43)	28.52 (83.34)	29.32 (84.78)	29.02 (84.24)	27.73 (81.91)	27.9 (82.22)	30.73 (87.31)
Daily mean °C (°F)	25.72 (78.3)	28.18 (82.72)	30.82 (87.48)	32.0 (89.6)	30.21 (86.38)	26.48 (79.66)	25.57 (78.03)	25.36 (77.65)	25.92 (78.66)	25.64 (78.15)	24.39 (75.9)	24.17 (75.51)	27.04 (80.67)
Average low °C (°F)	17.55 (63.59)	19.4 (66.92	22.11 (71.8)	23.64 (74.55)	23.05 (73.49)	21.21 (70.18)	20.73 (69.31)	20.48 (68.86)	20.29 (68.52)	19.74 (67.53)	18.26 (64.87)	17.31 (63.16)	20.31 (68.56)
Record low °C (°F)	12.0 (53.6)	15.0 (59.0)	16.0 (60.8)	20.0 (68.0)	19.0 (66.2)	18.0 (64.4)	19.0 (66.2)	18.0 (64.4)	18.0 (64.4)	16.0 (60.8)	14.0 (57.2)	12.0 (53.6)	12.0 (53.6)
Average precipitation mm (inches)	7.99 (0.31)	11.58 (0.46)	32.64 (1.29)	80.54 (3.17)	223.3 (8.79)	162.15 (6.38)	144.58 (5.69)	236.6 (9.31)	275.17 (10.83)	321.09 (12.64)	148.45 (5.84)	36.19 (1.42)	140.02 (5.51)
Average precipitation days (≥ 1.0 mm)	1.55	2.27	6.64	14.09	22.09	20.27	20.91	25.27	23.91	22.64	13.91	6.09	14.97
Average relative humidity (%)	58.38	47.96	46.08	52.17	64.05	72.95	74.61	77.4	77.55	78.76	77.64	71.22	66.56
Mean monthly sunshine hours	11.54	11.59	11.44	11.38	12.3	11.83	10.29	10.29	10.71	10.46	8.02	10.13	10.83

Table 3.2.: Weather of Mysore for the year 2022

Ref. https://tcktcktck.org/india/karnataka/mysore

3.4.2. Description

- Country: India
- City: Karnataka
- Latitude: 12.2958104

- Longitude: 76.6393805
- Attitude/Elevation: 742.98m (2437.6ft)
- Annual low temperature: 20.31ºC (68.56ºF)
- Annual high temperature: 30.73ºC (87.31ºF)
- Average annual precipitation: 140.02mm (5.51in)
- Coldest Month: December (17.31ºC / 63.16ºF)
- Warmest month: April (36.12ºC / 97.02ºF)
- Driest Month: January (7.99mm / 0.31in)
- Wettest Month: October (321.09mm / 12.64in)
- Number of days with rainfall (≥ 1.0 mm): 179.64 days (49.22%)
- Days with no rain: 185.36 days (50.78%)
- Humidity: 66.56%

3.5. Air Quality

It is very important to maintain the AQI of our surroundings because; they can increase the risk of heart and respiratory diseases, as well as lung cancer. It raises the danger of heart disease, lung cancer, and respiratory infections. Air pollution exposure, both short-term and long-term, has been linked to negative health effects. Those who are already unwell are subject to more severe effects. In general, AQI levels of 100 or less are considered to be good. Air quality is unhealthy when AQI values are above 100; initially for some susceptible individuals who are susceptible, then as AQI values rise for everyone.

3.5.1. Air Quality Index

The introduction of substances into the air that is harmful to humans, other living things, or the environment, such as chemicals, particulate matter, or biological elements like pollen grains, is referred to as air pollution. Human health impacts from exposure to air pollution include respiratory, cardiac, vascular, and neurological problems. Children are more vulnerable. Monitoring, exposure assessment, dosimeter, toxicology, and epidemiology are examples of scientific methods for evaluating the effects of air pollution on health.

Primary and secondary air contaminants are differentiated. Secondary pollutants are created in the atmosphere, whereas primary pollutants are directly released. Sulfur dioxide (SO2), which can cause acid rain, is one of the main major

pollutants produced by human activities. The most noticeable air pollutants are NO_2, particularly nitrogen dioxide released during high-temperature combustion. Both natural and man-made particles can be found in the air. Health risks are associated with elevated fine particle concentrations in the air. Particulate matter, which is created by diesel engines, power plants, factories, wind-borne dust, wood stoves, etc., is made up of very minute particles of soot, dust, or other substances, including tiny droplets of liquid. They have negative welfare impacts including impaired visibility, atmospheric deposition, and aesthetic problems in addition to having substantial health implications.

3.5.2. Air quality of Mysore

The latest data (Feb 2023) represented on www.aqi.in on the air quality of Mysore city shows that the city's overall air quality is good. In the AQI calendar, it is between 0-50 which is considered in good condition. In table 3.4 we can see the air monitoring data of two locations of Mysore namely Hebbal 1st Stage and Vivekananda Nagar. PM 2.5 is 24 in the air; PM 10 is 48 in the air at Hebbal 1st stage location. The PM 2.5 is 14 in the air; the PM 10 is 40 at the Vivekananda location. The status is moderate for both locations. As we see the weather condition it is sunny throughout the week (Table 3.5). The average temperature this week was counted between 25°c to 32°c (Table 3.3). The Air Quality Index Descriptor as per US EPA 2008 is given in Table 3.4.

Locations	Status	AQI-US	PM 2.5	PM 10	Temp	Humid
Hebbal 1st Stage	Moderate	76	24	48	32	17
Vivekananda Nagar	Moderate	55	14	40	32	17

Table 3.3: Air monitoring data of Mysore

Ref. https://www.aqi.in/in/dashboard/india/karnataka/mysore

Table 3.4: Air Quality Index Descriptor (U.S.EPA 2008).

Descriptor	AQI	Risk measure
Good	0 to 50	No message
Moderate	51 to 100	Usually sensitive individuals
Unhealthy for sensitive live groups	101 to 150	Identifiable groups at risk; different groups for different pollutants
Unhealthy	151 to 200	General public is at risk; sensitive groups at greater risk
Very unhealthy	201 to 500	General public is at greater risk; sensitive groups are at greatest risk

The air quality forecast of Mysore city has given in Table 3.5. The AQI for the whole week is in the range of 54 to 66, which is moderate. The weather throughout the week is sunny. Air Quality Index (AQI) of Mysore City for the month of December-2022 was 44 for PM_{10} was found to be good (KSPCB Manual Stations- Nov-22 & Dec-22-).

Table 3.5: Mysore city air quality forecast

ay	Sat	Sun	Mon	Tue	Wed	Thu	Fri
AQI	58	62	66	64	61	58	54
Weather	☀	☀	☀	☀	☀	☀	☀
Temp.	24.9°c	25.9°c	27.3°c	27.4°c	27°c	26.6°c	26.9°c

Ref. https://www.aqi.in/in/dashboard/india/karnataka/mysore

3.6.Noise quality of Mysore city

The aim of the World Health Organization (WHO) is to ensure that everyone has access to the best health possible. The word "noise" is derived from the Latin word "nausea," which denotes motion sickness or other uneasy feelings. Noise is made up of sounds that surround us but are not a part of the area being studied. It is also a form of pollution that affects our health, well-being, and work capacity for work. Industries, traffic and cars, construction, and home appliances are all sources of noise pollution.

Both direct and indirect consequences of noise are detrimental to our health and unpleasant to our quality of life.

Noise pollution is defined by the World Health Organization (WHO) as noise above 65 decibels (dB). More specifically, noise becomes unpleasant over 120 decibels (dB) and hazardous above 75 dB. As an average noise level over a day, your ear can tolerate noise levels up to 85 decibels. Our hearing can be harmed by sounds louder than 85 dB. The typical decibel range for normal conversation is between 60 and 70. Decibel is sometimes referred to as dB or dB (A).

All transportation systems create noise pollution. With residences created adjacent to factories, they experience noise pollution and its adverse effects. Besides transportation noise, noise can come from factory appliances, power tools, and audio entertainment systems. The secondary data on the noise quality of Mysore are listed in table 3.5. According to observations, it is clear that the noise quality of Mysore is sufficiently good.

Table 3.6: The magnitude of noise levels from some common noise sources in Mysore (Navneet and Kumar, 2017)

Sr.No.	Type of sources of noise	Noise level in decibels
1	Light Road Traffic (Side Streets)	60-70
2	Medium Road Traffic (Streets)	70-80
3	Heavy Road Traffic (Streets)	80-90
4	Rail Traffic	90-110
5	Air Traffic	90-110

3.6.1. Measure to reduce noise pollution

In some cases, noise pollution is unavoidable. However, there are ways to reduce noise levels inside the campus.

- Reducing noise from appliances: Items, such as air conditioning units, heaters, fans, and other appliances used in laboratories, can contribute to overall noise levels on the campus. Try turning them off more often or setting a timer, so they only switch on at certain times.

- Repair or replace old machinery: Old appliances, scientific machinery, vehicles, and other items can be louder than newer models. Consider upgrading or replacing noisy household items.
- Sound-proofing: Adding insulation strategically around the classrooms specifically more noise-proof rooms like yoga classrooms can help muffle sounds from other classrooms, playground noise, or outside other activities. Rugs, carpets, and curtains may also help.

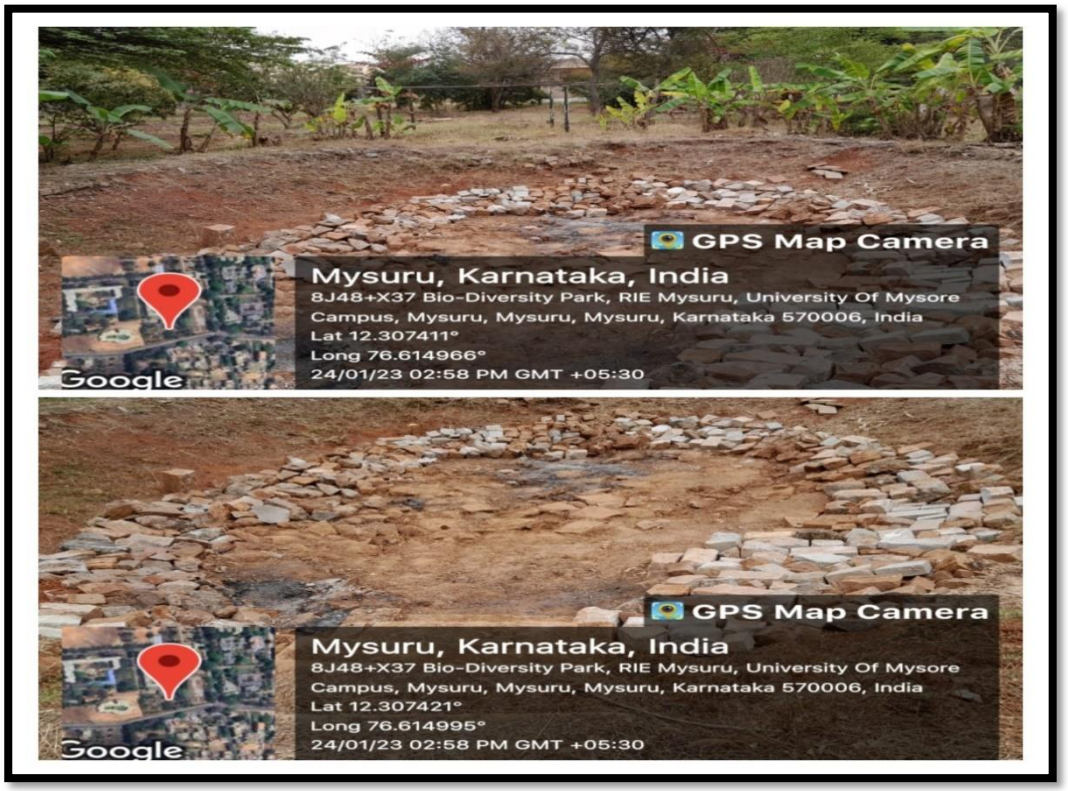


Fig 3.3: Rain water Harvesting in RIE Mysuru

Fig 3.4: Open drainage from the hostel

Fig 3.5: Wastewater from hostels used for gardening

Fig 3.6: Dustbins placed near hostels

3.7. Ecology

3.7.1. Floral Diversity

Mysore is a city located in the southern region of the Indian state of Karnataka. Geographically, the Mysore city may be located at 12° 18′ 26″ north latitude and 76° 38′ 59″ east longitude. It is situated 770 meters (2,530 feet) above mean sea level.

3.7.1.1. Suitability of Mysore Weather for floral biodiversity

The entire year, Mysore experiences a lovely climate. Mysore experiences a moderately hot climate in the summer. The summer months are April through June. In the summer, there will be a significant difference in temperature between the day and the night. Summer daytime temperatures typically range from 30 to 39 degrees Celsius. In the summer, the typical nighttime temperature is 20 °C. The warmest months are in May and June

The monsoon season lasts only a few months, from June to August. In comparison to the rest of the year, the relative humidity levels during the monsoon season are quite high. The weather in the city of Mysore is influenced by the southern monsoon winds.

The winter months of December through February are very pleasant, with daytime highs in December averaging 27° C. Wintertime lows at night are 17° C on average. Mysore receives 86 centimeters of rain on average every year, the majority of it falling between June and October during the monsoon season. Rain rarely lasts all day, even during the rainy season. As a result, Mysore's environmental conditions are quite moderate. No extreme environmental conditions are there in Mysore, this is the reason for the rich biodiversity of Mysore and also of RIE Campus. During the green audit visit, healthy floral biodiversity was observed with few species of Bryophytes to higher class angiosperms. Various types of plants were observed in RIE Campus. This indicates good environmental suitability for floral biodiversity growth.

3.7.2. Floral Diversity of RIE Campus

The floral species diversity in the RIE campus was 250 species. The entire diversity of the habitat in RIE Campus was broadly mesophytic ranging from scrub forests to tropical evergreen rain forests, and temperate, floral elements are seen in the campus. The major floral elements belong to Angiospermic families Ranunculaceae, Annonaceae, Rhamnaceae, Protulaceae, Euphorbiaceae, Caesalpinaceae, Fabaceae, Setrculiaceae, Violaceae, Acanthaceae, Convolvulaceae, Mimosaceae, Cucurbitaceae, Lamiaceae, Verbenaceae, Azoiaceae, Apocynaceae, Asclepidaceae, Poaceae, Cyperaceae, Palmae, Liliaceae. All classes of plants from Bryophytes, Pteridophytes, and angiosperms were reported during the campus visit and are mentioned as follows.

3.7.2.1.Bryophytes of RIE Campus:

Mosses, liverworts, and hornworts are together referred to as bryophytes. Since they are non-vascular plants, which lack roots and vascular structure, they take water and nutrients from the air by absorbing them through their surface (e.g., their leaves). As they don't require roots, they can grow in locations where other plants cannot, such as on the surface of rocks, walls, pavement, etc. The majority of them only reach a few centimeters in height. Bryophytes can be found in a wide variety of habitats, from deserts to arctic regions, and they flourish in moist, shaded conditions. There were over 7,000 liverwort species, 220 hornwort species, and 11,000 moss species worldwide. The environment of Mysore as well as of the RIE campus was suitable for the growth of bryophytes. Good numbers of Bryophytes plant species were also reported in the RIE campus as listed in Table 3.6.

3.7.2.2.Pteridophytes of RIE campus

Vascular plants called pteridophytes reproduced through spores. They are also referred to as cryptogams because they don't produce flowers or seeds. Pteridophytes grow best in cool, shaded, and damp environments. Certain pteridophytes can, however, also grow in sandy soil. Some common habitats of pteridophytes include moist shady forests, crevices of rocks, bogs, marshes, trunks of trees, etc. Several ferns were reported during a visit to RIE Campus as mentioned in Table 3.6. The presence of ferns indicates good environmental conditions on campus.

3.7.2.3. Gymnosperms of RIE campus

The vast majority of gymnosperms are found in temperate and subarctic climates, particularly conifers. Tropical or subtropical regions are the principal habitats for cycads and gnetophytes. A good number of Gymnosperms was also observed on RIE campus as listed in Table 3.6.

3.7.2.4.Angiosperms of RIE Campus

A habitat that supports angiosperm plant species that is diverse in both the floral and animal kingdoms. The presence of numerous angiosperm plants attracts a variety of animal life. It also promotes economic growth. During the green audit visit at the RIE campus, there was about 123 angiosperms plant species listed in Table 3.7.

3.7.2.5.Medicinal plants

More than half of the 150 prescribed medications were first produced from a plant or another natural component. Unfortunately, only around 5% of known plant species have undergone testing for medicinal purposes, and thousands of other plant species remain undiscovered. During a green audit of the RIE campus, some medicinal plants were recorded from RIE Campus which are listed in Table 3.9. All the medicinal plants observed in the RIE campus are of great medicinal value and are well flourishing because of the good soil quality and well-suited environment of Mysore.

3.7.2.6.Endangered, critically endangered and vulnerable plants of RIE campus:

Plant and animal species are the basis of healthy ecosystems. A species going extinct is a sign that the ecosystem is deteriorating over time. The extinction of one species leads to the extinction of all the others in its environment. Healthy ecosystems are necessary for humans to maintain a clean environment. There are some species endangered, critically endangered, and vulnerable in Karnataka state but those species were planted and well maintained in the RIE campus, and listed in Table 3.8.

3.7.3. Plant Species present in gardens of RIE Campus

There was a rose garden in front of the library and the lawn is in front of the office (Fig 3.11). The varieties of plant species present were Croton, Dracaena fragrans, Saplera, Sapota, Jamun, and Sampige (Fig 3.10). Apart from that orchards like Mango, Papaya, Coconut, jackfruit, jamun, tamarind, and Palm were also present.

Fig 3.7: Flora of RIE Campus

Fig 3.8: Flora of RIE Campus

Fig 3.9: Croton garden

Fig 3.10: Different plant species (Dracaena, croton, sampige etc) in garden

Fig 3.11: Rose Garden at RIE Mysore

Table 3.7: Bryophytes, Pteridophytes and Gymnosperms present in RIE Mysore

Sr.No.	Botanical Name	Common Name	Family
	Bryophytes of RIE campus		
1.	*Marchantia L.*	Common liverwort	Marchantiaceae
2.	*Riccia L.*	Floating crystalwort	Ricciacaeae
3.	*Anthoceros L.*	Field hornwort	Anthocerotaceae
4.	*Funaria Hedw.*	Cord moss	Bryaceae
5.	*Polytricumhedw.*	Haircap moss	Polytrichaceae
	Pteridophytes of RIE campus		
6.	*Adiantum lunulatum L.*	Walking fern	Adiantaceae
7.	*Adiantum caudatum L.*	Tailed maidenhair	Adiantaceae
8.	*Adiantum capillusvensis L.*	Maidenhair fern	Adiantaceae
9.	*Equisetum dithiopicum L.*	Horsetail	Equisetaceae
10.	*Achrophoru spulcher L.*	Grape wood borer	Equisetaceae
11.	*Achrophorus immerous L.*	Wood borer	Equisetaceae

12.	*Microlepia platyphylla C. Presl*	Microlepia	Dennstaedtidae
13.	*Pteris longifolia L.*	Longleaf brake	Pteridaceae
14.	*Nephro lepis Schott.*	Boston fern	Davalliacaeae
15.	*Ophioglossum reticulatum L.*	Netted adder's tongue	Ophioglossaceae
16.	*Ophioglossum parvifolium L.*	Alder's tongue fern	Ophioglossaceae
17.	*Selaginella Pal.*	Spikemoss	Selaginellaceae
18.	*Lygodium flexuosum Sw.*	Maidenhair creeper	Schizaceae
19.	*Psilotum Sw.*	Whisk Fern	Psilotacacac
20.	*Marselia L.*	Water-clover	Marsileaceae
21.	*Lycopodium L.*	Common club moss	Lycopodiacaeae
	Gymnosperms of RIE campus		
22.	*Cupressus L*	Cypress	Cupressaceae
23.	*Cycas L*	Queen sago	Cycadaceae
24.	*Ephedra L*	Mormon tea	Ephedraceae
25.	*Gnetum L*	Joint fir	Gnetaceae
26.	*Pinus L*	Pine	PinaceaeTaxaceae
27.	*Taxus L*	Yew	Zamiaceae
28.	*Thuja L*	White cedar	Cupressaceae
29.	*Zamia L.*	Cardboard palm	Zamiaceae

Table 3.8: Angiosperms of RIE campus

Sr. No.	Botanical Name	Common Name	Family
1.	*Acacia leucophloea roxb.*	White bark acacia	Mimosaceac
2.	*Acanthospermum hispidum*	Bristly starbur	asteraceae
3.	*Aegle marmelos(L.) correa*	Bel	rutaceae
4.	*Adhatoda vasica*	Malabar nut	acenthaceae
5.	*Agave angustifolia L*	Caribbean	Agavaceae
6.	*Agave americana Haw.*	Agave	Agavaceae

7.	*Alternanthera sessilis(L).*	Sessile joyweed	Amaranthaceae
8.	*Aloe vera burn*	Aloe plant	Asphodelaceae
9.	*Amaranthus spinosus L*	Prickly amaranth	Amaranthaceae
10.	*Amaranthus viridis L*	Pigweed	amaranthaceae
11.	*Ammannia baccifera L*	Tooth cup	Lythraceae
12.	*Anacardium occidentale*	Cashew	Anacardiaceae
13.	*Anagallis arvensis ssp.*	Shepherd's clock	Myrsinaceae
14.	*Andrographis paniculata (Vahl)*	Creat	Acanthaceae
15.	*Annona squamosa L*	Custard apple	Annonaceae
16.	*Artocarpus heterophyllusLam*	Jackfruit	Moraceae
17.	*Asparagus gonocladus (Baker) jessop*	Asparagus fern	Liliacea
18.	*Asparagus racemosus*	Wild asparagus	Asparagaceae
19.	*Averrhoa carambola L*	Carambola	Oxalidaceae
20.	*Azadirachta indica*	Neem	Meliaceae
21.	*Bacopa monnieri*	Indian pennywort	Scrophulariaceae
22.	*Biophytum sensitivum*	Sikerpud	Oxalidaceae
23.	*Boerhavia diffusa*	Red hogweed	Nyctaginaceae
24.	*Boerhavia erecta*	Erect spiderling	Nyctaginaceae
25.	*Bixa oraellana*	Lipstick tree	Bixaceae
26.	*Cardiospermum halicacabum*	Balloon vine	Sapindaceae
27.	*Carica papaya*	Papaya	Caricaceae
28.	*Calotropis procera*	Rubber bush	Asclepiadaceae
29.	*Cardiospermum halicacabum*	Golden shower tree	Sapindaceae
30.	*Catharanthus roseus*	Periwinkle	Apocynaceae
31.	*Ceiba pentandra*	Kapok	Bombacaceae
32.	*Centella asiatica*	Brahmi	Apiaceae
33.	*Citrus limon*	Lemon	Rutaceae
34.	*Cleome gynandra*	Wild spider flower	Cleomaceae

35.	*Cleome viscosa*	Asian spider flower	Cleomaceae
36.	*Citrus limon*	Butterfly pea	Rutaceae
37.	*Combretum indicum*	Rangoon creeper	Combretaceae
38.	*Cocculus hirsutus*	Broom creeper	Menispermaceae
39.	*Colebrookea oppositifolia*	Indian squirrel tail	Lamiaceae
40.	*Crotalaria juncea*	Sun hemp	Fabaceae
41.	*Crotalaria pallida*	Smooth rattlepod	Fabaceae
42.	*Crotalaria retusa*	Rettleweed	Fabaceae
43.	*Crotalaria verrucosa*	Blue rattlepod	Fabaceae
44.	*Curcuma longa*	Turmerica	Zingiberaceae
45.	*Cynoglossum lanceolatum*	Forget me not	Boraginaceae
46.	*Dalbergia sissoo*	Indian rosewood	Fabaceae
47.	*Datura innoxia*	Horn of plenty	Solanaceae
48.	*Dendrophthoe falcate*	Honey suckle mistletoe	Loranthaceae
49.	*Erythrina variegate*	Indian coral tree	Fabaceae
50.	*Eucalyptus tereticornis*	Forest red gum	Myrtaceae
51.	*Ficus bengalensis*	Banyan tree	Moraceae
52.	*Ficus drupacea*	Mysore Fig	Moraceae
53.	*Ficus elastica*	Indian Rubber Bush	Moraceae
54.	*Ficus racemosa*	Cluster fig	Moraceae
55.	*Ficus religiosa*	Peepal	Moraceae
56.	*Gloriosa superba*	Glory Lily	Liliaceae
57.	*Hamelia patens*	Firebush	Rubiaceae
58.	*Hedychium coronarium*	Butterfly Ginger Lily	Zingiberaceae
59.	*Hemidesmus indicus*	Indian Sarsaparilla	Asclepiadaceae
60.	*Hibiscus rosa-sinensis*	China rose	Malvaceae
61.	*Impatiens balsamina*	Balsam	Balsaminaceae
62.	*Ixora coccinea*	Ixora	Rubiaceae

63.	*Jacaranda mimosifolia*	Blue Jacaranda	Bignoniaceae
64.	*Jatropha curcas*	Physic Nut	Euphorbiaceae
65.	*Kigelia pinnata*	Sausage tree	Bignoniaceae
66.	*Lagerstroemia parviflora*	Small flowered crape myrtle	Lythraceae
67.	*Lantana camara*	Lantana	Verbenaceae
68.	*Lawsonia inermis*	Henna	Lythraceae
69.	*Leucas asper*	Common Leucas	Lamiaceae
70.	*Limonia acidissima*	Wood Apple	Rutaceae
71.	*Lycopersicon esculentum*	Tomato	Solanacea
72.	*Malvastrum coromandelianum*	False Mallow	Malvaceae
73.	*Mangifera indica*	Mango	Anacardiaceae
74.	*Manihot esculenta*	Tapioca	Euphorbiaceae
75.	*Manilkara zapota*	Chikoo	Sapotaceae
76.	*Martynia annua*	Devil's Claws	Martyniaceae
77.	*Mentha piperita*	Peppermint	Lamiaceae
78.	*Micheliachampaca*	Joy perfume tree	Magnoliaceae
79.	*Mimosa pudica*	Touch me not	Mimosaceae
80.	*Mirabilis jalapa*	4 o'clock plant	Nyctaginaceae
81.	*Morinda pubescens*	Indian Mulberry	Rubiaceae
82.	*Moringa oleifera*	Drumstick tree	Moringaceae
83.	*Musa paradisiaca*	Banana	Musaceae
84.	*Nyctanthes arbor-tristis*	Coral Jasmine	Oleaceae
85.	*Ocimum americanum*	Hoary Basil	Lamiaceae
86.	*Ocimum basilicum*	Basil	Lamiaceae
87.	*Opuntia elatior*	Prickly pear	Cactaceae
88.	*Oxalis corniculata*	Creeping wood sorrel	Oxalidaceae
89.	*Ziziphus nummularia*	Jhar Beri	Rhamnaceae
90.	*Passiflora edulis*	Passion fruit	Passifloraceae

91.	*Passiflora foetida*	Love-in-a-mist	Passifloraceae
92.	*Pedalium murex*	Large Caltrops	Pedaliaceae
93.	*Peltophorum pterocarpum*	Copper rusty shield bearer	Caesalpiniaceae
94.	*Peperomia pellucida*	Shiny Bush	Piperaceae
95.	*Pedalium murex*	Star Gooseberry	Pedaliaceae
96.	*Phyllanthus amarus*	Carry Me Seed	Euphorbiaceae
97.	*Phyllanthus emblica*	Amla	Phyllanthaceae
98.	*Piper nigrum*	Black Pepper	Piperaceae
99.	*Plectranthus amboinicus*	Cuban Oregano	Lamiaceae
100.	*Plumbago zeylanica*	Chitrak	Plumbaginaceae
101.	*Polyalthia longifolia*	False Ashok	Annonaceae
102.	*Pongamia pinnata*	Indian beach tree	Fabaceae
103.	*Portulaca oleracea*	Purslane	Portulacaceae
104.	*Psidium guajava*	Guava	Myrtaceae
105.	*Punica granatum*	Pomegranate	Lythraceae
106.	*Ruta graveolens*	Rue plant	Rutaceae
107.	*Santalum album*	Sandal wood	Santalaceae
108.	*Sapindustrifoliatus*	South India Soapnut	Sapindaceae
109.	*Sesamum indicum*	Sesame	Pedaliaceae
110.	*Spathodea campanulata*	African tulip tree	Bignoniaceae
111.	*Striga densiflora*	Denseflower Witchweed	Scrophulariaceae
112.	*Swietenia macrophylla king*	Big leaf Mahogany	Meliaceae
113.	*Talinum fruticosum*	Ceylon Spinach	Portulacaceae
114.	*Tamarindus indica*	Tamarind	Caesalpiniaceae
115.	*Terminalia bellirica*	Baheda	Combretaceae
116.	*Terminalia catappa*	Indian Almond	Combretaceae
117.	*Tinospora cardifolia*	Gulbel	Menispermaceae
118.	*Toddalia asiatica*	Orange Climber	Rutaceae

119.	*Tridax procumbens*	Tridax Daisy	Asteraceae
120.	*Tribulus terrestris*	Puncture Vine	Zygophyllaceae
121.	*Vitex negundo*	Chaste tree	Verbenaceae
122.	*Waltheria Americana*	Sleepy Morning	Sterculiaceae
123.	*Withaniasomnifera*	Ashwagandha	Solanaceae

Table 3.9: List of endangered, critically endangered and vulnerable plants of RIE

Sr.No.	**Botanical Name**	**Common Name**	**Family**
	Endangered plants species		
1.	*Kingiodendronpinnatum*	Malabar mahogany	Fabaceae
2.	*Myristica malabarica*	Malabar Nutmeg	Myristicaceae
3.	*Pterocarpus santalinus*	Red sanders	Santalaceae
4.	*Rauwolfia serpentine*	Milkweed	Apocynaceae.
	Critically endangered plant species		
5.	*Cosciniumfenestratum*	Tree turmeric	Menispermaceae
6.	*Kaempferia galanga*	Aromatic ginger,	Zingiberaceae
7.	*Syzygiumtravancoricum*	Jamun	Myrtaceae
8.	*Trichopuszeylanicus*	Arogya Pacha	Trichopodaceae,
	Vulnerable plant species		
9.	*Aristolochiatagala*	India birthwort	Aristolochiaceae
10.	*Commiphorawightii*	Gugal, Guggul,	Burseraceae
11.	*Cycas circinalis*	Queen sago	Cycadaceae
12.	*Holostemmaada-kodien*	Holostemma	Asclepiadaceae
13.	*Ochreinauclea missionis*	Neervanchi	Rubiaceae
14.	*Saraca asoca*	Ashoka tree	Fabaceae

Table 3.10: Medicinal plants observed in RIE campus

Sr. No.	Botanical Name	Common Name	Family
1.	*Gloriosa superba*	Gloriosa lily, Glory lily	Colchicaceae
2.	*Rauwolfia tetraphylla*	Be still tree or devil-pepper	Apocynaceae
3.	*Withania somnifera*	Ashwagandha or winter cherry	Solanaceae
4.	*Cassia fistula*	Indian Laburnum	Caesalpiniaceae
5.	*Catharanthus roseus*	Madagascar periwinkle	Apocynaceae
6.	*Andrographis paniculata*	King of Bitters	Acanthaceae
7.	*Evolvulus alisenioides*	Dwarf morning-glory	Convolvulaceae
8.	*Desmodium trifolium*	Three-flowered beggarweed.	Fabaceae
9.	*Adhatodavasica*	Malabar nut	Acanthaceae
10.	*Zanthoxylum asiaticum*	Orange climber	Rutaceae
11.	*Phyllanthus emblica*	Indian gooseberry	Phyllanthaceae.
12.	*Phyllanthus niruri*	Gale of the wind	Phyllanthaceae.
13.	*Santalum album*	Sandalwood	Santalaceae
14.	*Andrographis serpillifolia*	False water willows	Acanthaceae
15.	*Piper longum*	Long pepper	Piperaceae,
16.	*Kaloenche pinnata*	Life Plant	Crassulaceae
17.	*Boerhaviadiffusa*	Red spider ling	Nyctaginaceae
18.	*Delonix regia*	Flamboyant	Fabaceae
19.	*Peltophorum ferrugineum*	-	Fabaceae
20.	*Tabubia rosea*	Trumpet Tree	Bignoniaceae
21.	*Terminalia catappa*	Country almond, Indian almond	Combretaceae,
22.	*Jacaranda mimosifolia*	Jacaranda, Blue jacaranda,	Bignoniaceae
23.	*Eucalyptus globulus*	Gum trees	Myrtaceae
24.	*Araucaria araucana*	Monkey puzzle tree	Araucariaceae
25.	*Podocarpus macrophyllus*	Yew plum pine, Buddhist pine	Podocarpaceae

3.7.4. Agricultural practices of RIE Campus

The RIE conducted agricultural practices inside the campus. The saplings were procured from a nursery which is also present and developed on the campus itself. After plantation whichever organic manure is required is also prepared by vermicomposting. For the preparation of vermicomposting whatever material is required like cow dunk and leaf litter also comes from the campus itself by doing animal husbandry. In this way, a big network of agricultural activities is organized by the RIE campus which is interesting to the biodiversity of the campus. All activities carried out on campus and related observations during the green audit visit are as follows.

3.7.4.1. Coconut trees plantation

In the RIE campus a big area of land i.e., 5 acres of land was under a coconut plantation (Fig 3.13). A special area was created, which was only for coconut plantations. In this area of land, a total of 500 coconut plants of native coconut species were planted. The coconuts were sold on the campus at a very reasonable rate of 10 to 15 Rs. for one coconut. It means they didn't use any of their products for commercial purposes. They sell it to campus people at a reasonable rate so that these people get the benefit of these products in a very less amount. It was a good activity carried out by RIE Campus.

3.7.4.2. Mango trees plantation

In RIE campus10 acres of land were under mango tree plantation (Fig 3.12). A special area was created which was only for mango tree plantations like that of coconut tree plantations. In this area of land, a total of 500 mango trees of native mango species were planted. Of which 250 plants were Malika (The 'Mallika' mango is the result of the hybridization of the Indian mango varieties Neelum and Dasheri) variety of mangoes and 250 plants are of Badami (Botanical name: *Mangifera indica*, common name; Alphonso) variety of mangoes. The mangoes produced were sold on the campus at a very reasonable rate of 50 Rs. per Kg. It means they didn't use any of their products for commercial use.

3.7.4.3. Traditional old and unique seed collections

Karnataka is a state of tradition. Traditional plant species which are native to Karnataka are conserved by Karnataka's people and we didn't find them in other states of India. There is some traditional, very old, and unique seed collection of Karnataka which is conserved by the agricultural sector of the RIE Campus. This is a good activity conducted by the RIE campus, and the main aim of this is to conserve and protect the traditional old and unique plants collection of State Karnataka.

3.7.4.4. Organic pesticides

Those created from natural chemicals are referred to as organic insecticides for plants. That doesn't imply they are chemical-free; it only means that the chemicals come from natural and mineral sources. In the RIE campus plantations is everywhere, in gardens, roadside plantation, coconut tree plantation, and kitchen garden. They didn't use any chemical pesticides. To control pests or insects they use organic pesticides which weresynthesized in campus by using organic materials like neem leaves and other materials. They prepare organic pesticides and apply them only on campus plants. In this way, they avoid chemical-based pesticides which are a way to reduce hazards to the environment.

3.7.4.5. Organic fertilizer

For better growth and better productivity of plants on the RIE campus, they use organic fertilizersinstead of chemical fertilizers like NPK. These organic fertilizers were also prepared in the campus and used for the plants. For the preparation of this organic fertilizer neem (Leaves of *Azadirachta indica*) leaves along with cow dunk are combined and allowed to rest for six months. After six months the organic fertilizer is ready and is used for plants in the campus area.

3.7.4.6. Vermicomposting

Vermicompost is the outcome of a decomposition process that uses a variety of worm species, typically red wigglers, white worms, and other earthworms, to produce a mixture of bedding materials, decomposing food or vegetable waste, and vermicast. Vermicompost can improve the physical, chemical, and biological fertility of the soil. Physically, soil that has been treated with vermicompost has improved aeration, porosity, bulk density, and water retention.Chemical properties such as pH, electrical

conductivity, and organic matter content are also improved for better crop yield. Vermicompost was prepared in the RIE campus by collecting the leaf litter (3.18). The cowdung was also available in the campus (Fig 3.19) as they have six cows' shelters.

3.7.4.7. Nursery

RIE campus had built its nursery in the campus area. This nursery had a collection of unique and traditional plant species of Karnataka along with medicinal plants, economically important plants, and many more important plant species. Whenever plantation occurs in the campus area, the required plant saplings were provided by the nursery of campus only and not from outsources.

3.7.4.8. Dasara flower competition

The famous Dasara flower show was organized at Nishad Bagh (Kupanna Park) traditionally from last many years. An annual feature during Dasara every year, over 50,000 flower pots with decorative plants cultivated by the Department of Horticulture has displayed. The Department of agriculture from the RIE campus participated in this Dasara flower show (Fig 3.20), and every year they won first prize in this competition. This is because they have their unique seed collection, which is very rare and specific and they kept this collection conserved. Prior few months before the Dasara flower show they started preparing and sow their unique seeds.

3.7.4.9. Kitchen garden

RIE campus has a special kitchen garden (Fig 3.15) where they produce various daily required vegetable crop plants. The vegetables produced by this kitchen garden were given to the people of campus at a minimum price.

3.7.4.10. Green house

RIE campus has a conservation of a few endangered and rare plant species along with some critically endangered plants. These plants required specific environmental conditions which havebeen provided in the greenhouse at RIE (Fig 3.14).

Fig 3.12: Mango Plantation at RIE campus

Fig 3.13: Coconut Plantation at RIE campus

Fig 3.14: Green House at RIE campus

Fig 3.15: Kitchen Garden at RIE campus

Fig 3.16: Vegetables harvest in kitchen garden of RIE campus

Fig 3.17: Distribution of vegetables in students of RIE

Fig 3.18: Compost and Vermicompost at RIE campus

Fig 3.19: Cows and symbiotic relation with Egrets at RIE campus

Fig 3.20: Dasara Flower Show at RIE campus

Fig 3.21: Certificate of first prize in Dasara flower show competition

3.8. Fauna of RIE Campus

India hosts three biodiversity hotspots: the Himalayas, the Western Ghats, and the Indo-Burma region. These hotspots have numerous endemic species. India displays significant biodiversity. One of eighteen mega-diverse countries, it is home to 7.6% (410 species) of all mammalian, 12.6% (1,250 species) of all avian, 6.2% (408 species) of all reptilian, 4.4% (2,546 species) of all amphibian, 11.7% (2,546 species) of all fish, and 6.0% of all flowering plant species.

The biodiversity of faunal elements (137 spp.) occurring in the RIE campus, Mysore has described the following groups of animals. The fauna of the RIE campus is given in Table 3.10.

1. Mammals (8 Species)
2. Birds (60 Species)
3. Reptiles (8 Species)
4. Amphibians (4 Species)
5. Molluscans (3 Species)
6. Insects (16 Species)
7. Spiders (10 Species)
8. Butterflies (28 Species)

Table 3.11: Fauna of RIE Campus

Sr.No	Scientific Name	Common Name	Family
Mammals			
1.	*Funambulus palmarum*	Indian palm squirrel	Sciuridae
2.	*Lepus nigricollis*	Indian Hare	Leporidae
3.	*Herpestes auropunctatus*	Indian Mongoose	Herpestidae
4.	*Rattus norvegicus*	Common Rat	Murids
5.	*Mus musculus*	House Mouse	Murids
6.	*Pteropus giganteus*	Indian Flying Fox	Pteropodidae
7.	*Macaca radiata*	Bonnet Macaque	Cercopithecidae
8.	*Paradoxurus hermaphroditus*	Asian palm civet	Viverrids
Birds			
1.	*Turdoides malcolmi*	Large grey babbler	Leiothrichidae
2.	*Turdoides affinis*	Yellow billed babbler	Leiothrichidae
3.	*Megalaima haemacephala*	Coppersmith barbet	Megalaimidae
4.	*Megalaima viridis*	White cheeked barbet	Megalaimidae
5.	*Merops philippinus*	Blue tailed Bee eater	Meropidae
6.	*Merops orientails*	Small green Bee eater	Meropidae
7.	*Muscica padauurica*	Asian brown flycatcher	Muscicapidae
8.	*Cyornis tickelliae*	Tickell's blue flycatcher	Muscicapidae
9.	*Pycnonotus cafer*	Red vented bulbul	Pycnonotidae
10.	*Pycnonotus jocosus*	Red whiskered bulbul	Pycnonotidae
11.	*Pycnonotus luteolus*	White browed bulbul	Pycnonotidae
12.	*Corvus splendens*	House crow	Corvidae
13.	*Corvus macrorhynchos*	Indian jungle crow	Corvidae
14.	*Centropus sinensis*	Crow pheasant	Cuculidae
15.	*Clamator jocobinus*	Pied cuckoo	Cuculidae
16.	*Streptopelia decaocto*	Collared dove	Columbidae

17.	*Streptopelia chinenens*	Spotted dove	Columbidae
18.	*Dicrurus leucophaeus*	Ashy drongo	Dicruridae
19.	*Dicrurus macrocercus*	Black drongo	Dicruridae
20.	*Spilornis cheela*	Crested serpent eagle	Accipitridae
21.	*Bubulcus ibis*	Cattle egret	Ardeidae
22.	*Egretta garzetta*	Little egret	Ardeidae
23.	*Ardea alba*	Large egret	Ardeidae
24.	*Dicaeum erythrorhynchos*	Pale billed flowerpecker	Dicaeidae
25.	*Ardeola grayii*	Indian pond heron	Ardeidae
26.	*Upupa epops*	Common Hoopoe	Upupidae
27.	*Ocyceros birostris*	Indian grey hornbill	Bucerotidae
28.	*Pseudibis papillosa*	Black ibis	Threskiornithidae
29.	*Alcedo atthis*	Common Kingfisher	Alcedinidae
30.	*Halcyon smyrnensis*	White breasted kingfisher	Alcedinidae
31.	*Eudynamys scolopaceus*	Asian Koel	Cuculidae
32.	*Elanus caeruleus*	Black shouldered kite	Accipitridae
33.	*Halia sturindus*	Brahminy kite	Accipitridae
34.	*Milvus migrans*	Black kite	Accipitridae
35.	*Vanellus indicus*	Red-wattled lapwing	Charadriidae
36.	*Pericrocotus cinnamomeus*	Small Minivet	Campephagidae
37.	*Lonchura atricapilla*	Black headed munia	Estrildidae
38.	*Acridotheres tristis*	Common myna	Sturnidae
39.	*Acridotheres fuscus*	Myna Jungle	Sturnidae
40.	*Oriolus oriolus*	Eurasian golden oriole	Oriolidae
41.	*Otus bakkamoena*	Collared scops owl	Strigidae
42.	*Athene brama*	Southern spotted owlet	Strigidae
43.	*Psittacula krameri*	Rose ringed parakeet	Psittacidae
44.	*Pavo cristatus*	Indian peafowl	Phasianidae

45.	*Columba livia*	Rock pigeon	Columbidae
46.	*Prinia socialis*	Ashy Prinia	Cisticolidae
47.	*Saxicoloides fulicatus*	Indian Robin	Muscicapidae
48.	*Copsychuss aularis*	Oriental Magpie robin	Muscicapidae
49.	*Coracias benghalensis*	Indian Roller	Coraciidae
50.	*Accipiter badius*	South Indian Shikra	Accipitridae
51.	*Passer domesticus*	House Sparrow	Passeridae
52.	*Cinnyris asiaticus*	Purple sunbird	Nectariniidae
53.	*Leptocoma zeylonica*	Purple-rumped sunbird	Nectariniidae
54.	*Cypisurus balasiensis*	Asian palm swift	Apodidae
55.	*Parus major*	Great tit	Paridae
56.	*Motacilla flava*	Western yellow wagtail	Motacillidae
57.	*Iduna caligata*	Booted warbler	Acrocephalidae
58.	*Acrocephalus dumetorum*	Blyth's reed warbler	Acrocephalidae
59.	*Dinopium benghalense*	Golden-backed woodpecker	Picidae
60.	*Chrysocolaptes festivus*	White-naped woodpecker	Picidae
Reptiles			
1.	*Calotes versicolour*	Indian garden lizard	Agamidae
2.	*Naja naja*	Indian cobra	Naja
3.	*Vipera russelli*	Russell viper	Viperidae
4.	*Bungarus fasciatus*	Banded krait	Elapidae
5.	*Ptyas mucosa*	Indian rat snake	Colubridae
6.	*Ahaetulla nasuta*	Green tree snake	Pythonidae
7.	*Hemidactylus frenatus*	House Gecko	Gekkonidae
8.	*Eutropis carinata*	Golden skink	Scincdae
Amphibians			
1.	*Bufo bufo*	True toad	Bufonidae

2.	*Bufo melanostictus*	Asian common toad	Bufonidae
3.	*Hyla sp.*	Tree frog	Hylidae
4.	*Grass frog ran asp.*	Common frog	Hylidae
Molluscs			
1.	*Helix aspersa*	Garden snail	Helicidae
2.	*Achatina achatina*	African giant snail	Helicidae
3.	*Gastropoda*	Slugs	Gastropoda
Insects			
1.	*Lepisma saccharina*	Silver fish	Lepismatidae
2.	*Gryllodes sigillatus*	True cricket	Gryllidae
3.	*Musca nebula*	Housefly	Muscidae
4.	*Xylotrupes ulysses*	Rinoceros beetle	Scarabaeidae
5.	*Scarabaeus viettei*	Dung beetle	Scarabaeidae
6.	*Mantis religiosa*	Praying mantis	Mantidae
7.	*Anisoptera*	Dragon fly	Libellulidae
8.	*Scolopendra sp.*	Centipede	Scutigeridae
9.	*Spirobolus sp.*	Milipede	Ammodesmidae
10.	*Odonto termes sp.*	Termite	Termitidae
11.	*Palamnaeus sp.*	Scorpion	Scorpionidae
12.	*Magicicada sp.*	Cicada	Cicadidae
13.	*Distoleon sp.*	Antlion	Myrmeleontidae
14.	*Blatta orientalis*	Cockroach	Blattidae
15.	*Anopheles sp.*	Mosquito	Culicidae
16.	*Caelifera*	Grasshopper	Acrididae
Spiders			
1.	*Salticus scenicus*	Zebra spider	Salticidae
2.	*Tetragnatha mandibulata*	Common big-jawed spider	Tetragnathidae
3.	*Hersilia savigyri*	Common two-tailed spider	Hersiliidae
4.	*Polyboea vulpine*	Brown grass spider	Agelenidae

5.	*Epeusflavo bilineatus*	Yellow-lined epeus	Salticidae
6.	*Menemerus bivittatus*	Common house jumper	Salticidae
7.	*Dieta virens*	Green crab spider	Thomsidae
8.	*Parawixia dehaani*	Common garden spider	Araneidae
9.	*Spartaeus spinimanus*	Spiny-legged jumper	Araneidae
10.	*Peucetia viridans*	Green lynx	Oxyopidae
Butterflies			
1.	*Tirumala limniace*	Blue tiger	Nymphalidae
2.	*Danaus chrysippus*	Plain tiger	Nymphalidae
3.	*Danaus genutia*	Striped tiger	Nymphalidae
4.	*Euploea core*	Indian common crow	Nymphalidae
5.	*Melanitisleda*	Common evening brown	Nymphalidae
6.	*Mycalesis perseus*	Common bush brown	Nymphalidae
7.	*Orsotrianea medus*	Nigger	Nymphalidae
8.	*Junonia hierta*	Yellow pansy	Nymphalidae
9.	*Junonial monias*	Lemon pansy	Nymphalidae
10.	*Junonia orithya*	Blue pansy	Nymphalidae
11.	*Hypolimnas bolina*	Great eggfly	Nymphalidae
12.	*Hypolimnas misippus*	Danaid eggfly	Nymphalidae
13.	*Ariadne merione*	Common castor	Nymphalidae
14.	*Acraea violae*	Tawny Coster	Nymphalidae
15.	*Ypthima baldus*	Common four rings	Nymphalidae
16.	*Euthalia aconthea*	Common baron	Nymphalidae
17.	*Pieris canidia*	Indian cabbage white	Pieridae
18.	*Euremahecabe*	Common grass yellow	Pieridae
19.	*Catopsiliapomona*	Common emigrant	Pieridae
20.	*Catopsiliapyranthe*	Mottled emigrant	Pieridae
21.	*Delias eucharis*	Common jezebel	Pieridae

22.	*Anaphaeisaurota*	Pioneer white	Pieridae
23.	*Graphiumdoson*	Common jay	Papilionidae
24.	*Graphiumagamemnon*	Tailed jay	Papilionidae
25.	*Papiliopolytes*	Common Mormon	Papilionidae
26.	*Papiliopolymnestor*	Blue Mormon	Papilionidae
27.	*Papiliodemoleus*	Lime butterfly	Papilionidae
Skippers			
28.	*Spialiagalba*	Indian skipper	Hesperiidae

Fig 3.22: Mammals at RIE campus

Fig 3.23: Birds RIE campus

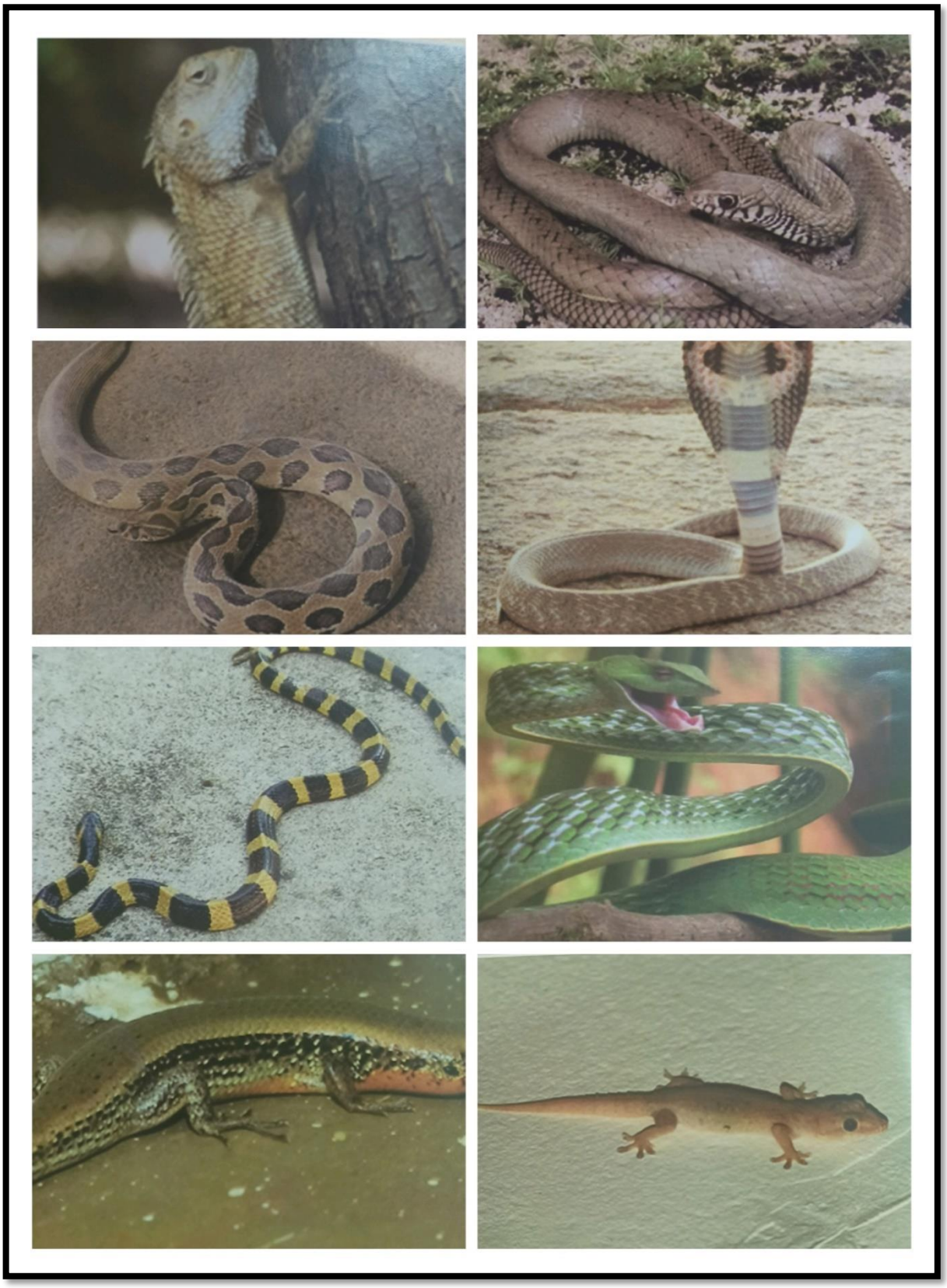


Fig 3.24: Reptiles at RIE campus

Fig 3.25: Molluscans at RIE campus

Fig 3.26Arachnids at RIE campus

Fig 3.27: Insect at RIE campus

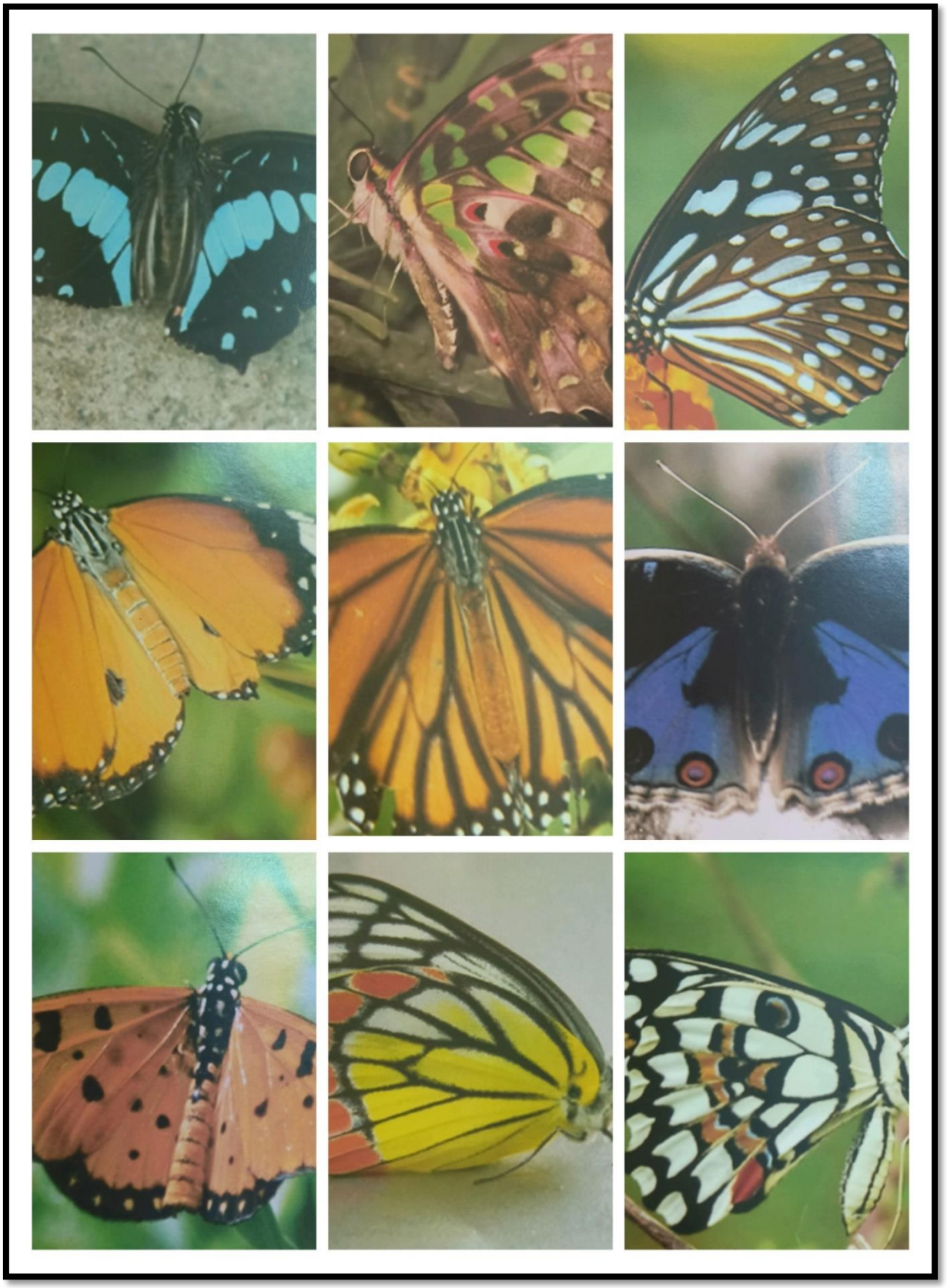


Fig 3.28: Lepidopterans at RIE campus

3.9. Eco-friendly Activities of RIE Campus

There was a green initiative student club called Eco-warriors, and students are involved in the tree plantation programmes, name plate preparations and in watering the plants. Other plantation was done by NCC, Staff members, etc. Environment concern rally is also organized in the institute.

Fig 3.29: Plantation by ECO warrior's group students at RIE campus

Fig 3.30: Plantation by NCC Students at RIE campus

Fig 3.31: Plantation done by staff member

Fig 3.32: Environmental Rally at RIE campus

3.10. Other Observation

- Underground work of all wire lines was going on in the institute (Fig 3.34).
- Auditorium work was under construction in the institute.
- Shops were built inside the campus for easy availability of local goods for staff members living inside the campus. But the shops were not started yet (Fig 3.33).
- There was also a small section of apiculture in the institute where the rearing of *Apis florea* was done (Fig 3.35).

3.10.1. Facilities for Girls in Hostels

- There are 284 toilets for girls in the hostels and 11 in the campus.
- There are solar heaters present in the hostels.
- There is the presence of a sanitary napkin incinerator with a capacity of 500 to 1000 napkins incinerated at a time.

Fig 3.33: Shopping complex of RIE (not started yet)

Fig 3.34: Working of underground wire lines

Fig 3.35: Apiculture at RIE campus

Chapter 4

Recommendations and Management Plans

4.1. Recommendations and Management Plan for RIE

It is important to take into account institute management policies and resource-use strategies. For its sustainable development, the institute must have a green policy/environmental policy. The institution's management should be commended for their careful implementation of the environmental policy. The institution should have a procurement policy as well as a policy on awareness training programs.

4.2. Follow-up Management Plans

The process of conducting a green audit produces a significant amount of useful management data. It often takes a lot of time, money, and effort to complete this task, thus it must be justified. It is crucial to guarantee that the audit's conclusions and suggestions are taken into account at the proper level within the campus and that management strategy and implementation plans are developed as a result of the

findings. Follow-up on audits is a step in the larger process of ongoing improvement. Without follow-up, the audit degenerates into a singular occurrence that is quickly forgotten due to the demands of management priorities and the passage of time.

4.3. Environmental Education

The following environmental education program may be implemented in the institute before the next green auditing.

- Training programmes in the management of solid waste, and liquid waste, the establishment of nurseries for medicinal plants, the management of water, vegetable cultivation, tree planting, the management of energy and landscape, pollution monitoring methods, and rainwater harvesting methods.
- Increase the number of informational signs about environmental awareness, such as "plastic-free campus," "save water, save electricity," "don't waste food or water," and "no smoking".
- Promote and expand the environmental clubs.
- Install model rainwater harvesting systems, rainwater pits, herb gardens, medicinal plant gardens, paddy fields, etc. for providing proper training to the students.
- Conduct recycling waste product exhibitions.
- Install a chemical treatment system for laboratory wastewater.
- Concern over carbon emissions.
- Students and Staff members may be made fully aware of the pollution produced by the use of vehicles.
- The carbon consumption awareness programmes on carbon emission at an individual as well as social level will help to avoid air and noise pollution in the campus due to vehicles.

The green audit supports the process of evaluating performance in the environmental area and is quickly turning into a crucial tool for institutional decision-making. The process of achieving an eco-friendly approach to the institute's sustainable development is aided by the green audit reports. It is hoped that the outcomes of the green auditing report would inspire new initiatives and creative practices while also serving as a guide for educating the institute community about the current environmental practices and resource utilization at the college. Many suggestions are

made to reduce the threat of waste management by utilizing scientific and environmentally beneficial methods. In the framework of a green campus, and consequently a sustainable environment and community development, this could result in a promising future. It has often been demonstrated that the useful recommendations, alternatives, and observations obtained through audits have improved campus administration. Staff members who have been too close to issues or solutions to appreciate the worth of other strategies frequently benefit from an outside viewpoint, vision, and opinion. A green audit report is a very effective and valuable communication tool to utilize when working with different students who need to be convinced that things are functioning smoothly and that systems and procedures are coping with natural changes and alterations that occur.

4.4. Common Recommendations

- Environmental policy to be implemented for the college.
- Purchasing strategy for eco-friendly materials to be implemented
- Environmental Science course to all students may be introduced.
- Introduce the number of seminars and group discussions on environmental education to be increased in the institute.
- Students and staff may be permitted to solve local environmental problems.
- Introduced a gas-saving renovation to the canteen's cooking system
- Methods for the management of water, waste, and energy are to be developed.
- The celebration of environmental programs like ozone day and the environmental day is to be encouraged.
- Recycling of paper may be introduced.
- Strict guidelines for Sanitary Napkin Incineration for girls' hostels may be implemented.

4.5. Criteria wise Recommendations

4.5.1. Water

- Please remove damaged taps and install sensitive taps where necessary. A slow-flow tap shall be installed.
- Rainwater harvesting systems for each building may be installed.
- Water treatment systems maintenance to be done.
- Conducting awareness programs on water conservation to be introduced.
- To control water exploitation, notice boards are to be introduced.
- To record water usage in the college RIE premises, a water meter is to be installed.

4.5.2. Energy

- Solar energy and other renewable sources are to be utilized in the institute.
- Introduce awareness programs about energy conservation for staff and student
- Installed LED monitors in place of laptops and TVs.
- Old fans replaced with more energy-efficient models to be done.
- Try to observe a power-saving day every year.
- Systems for automatic power switch-off to be done.

4.5.3. Waste

- Construction of working biogas plant to be done
- The model solid waste treatment system may be established.
- The practice of waste segregation may be initiated.
- A model vermicomposting plant in the institute may be installed.
- Established a plastic-free campus to be done
- Try to don't use paper plates or glasses at any campus events.
- Regular visits are to be made to ensure that the generated waste is consistently measured, monitored, and recorded and that the administration has access to the data.
- Solid waste is to be reused or recycled at the maximum possible places.
- Strict guidelines are to be made for girls in hostels for using incineration plant for sanitary napkins disposal.

- Try to recycle the paper waste instead of incinerating or burning or selling it as Raddi.

4.5.4. Green Campus

- Dominant trees in the campus are to be named scientifically.
- A separate area for the planting of trees and medicinal plants is to be established
- Indoor plants in pots in the classroom and on the veranda are to be grown.
- An automated drip irrigation system in time for summer is to be installed.
- Not just celebrate environment day but try to make it a daily habit.
- Indoor plants may be added to the institute's building to make it more attractive.
- Try to motivate students to contribute to making the campus more environmentally friendly through actions as well as words.
- Competitions between departments to increase interest in campus sustainability among students and teaching and non-teaching staff are to be organized.

4.6. Management Plans

4.6.1. Waste Treatment Management Plan

There is to be proper management of waste in the campus. However, two composting pits were used for waste management of biodegradable waste used in the campus. Therefore, it is suggested management plans for waste management.

4.6.2. Solid waste management

4.6.2.1. Make compost pit in each quarter

Solid waste should be reused or recycled at the maximum possible places. Disposal of any chemical into the solid waste disposal system is not allowed. There were many staff quarters in the campus which means lots of waste were generated in each quarter.

For Biodegradable waste, it is suggested to make a pit in before each staff quarter as given in fig 4.1, in which regular wastes can be dumped it. The manure can be utilized in gardens. It is recommended to make one big composting bed for the management of all biodegradable wastes on the campus of RIE.

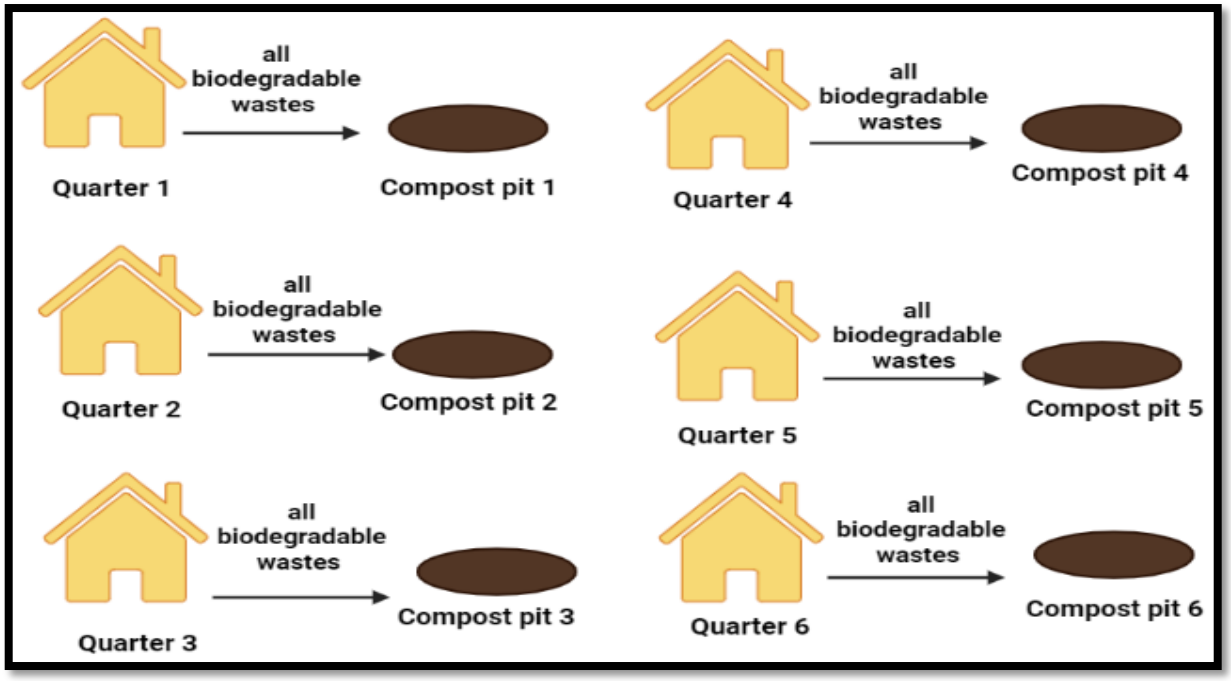


Fig 4.1: Example of waste management by composting pit in each quarter

4.6.2.2. Other Methods

a. Landfill

In low-lying areas inside the institute, the waste that cannot be recycled or reused is segregated and spread out in a thin layer. After each layer of garbage, a layer of soil is added.

b. Incineration

Incineration is the process of burning waste under controlled conditions to turn it into incombustible materials like ash and waste gas. The exhaust fumes from this process are treated before being released into the environment since they could be hazardous. This approach is one of the most hygienic ways to dispose of waste because it minimizes the volume of waste by 90%. Occasionally, the heat produced is used to generate electricity. The production of greenhouse gases like carbon dioxide and carbon monoxide makes this process, however, unfavorable to the environment. It is recommended to install an incineration plant for non-biodegradable waste management if possible.

c. Waste Compaction

The waste materials such as cans and plastic bottles are compacted into blocks and sent for recycling. This method makes transportation and positioning simply by preventing metal oxidation and lowering the demand for airspace.

d. Plastic Waste Management

Plastic is particularly problematic since it is not biodegradable and consequently persists far longer than other types of waste. Therefore, try to avoid the use of plastic on campus, and encourage the use of biodegradable materials as alternatives. Try to achieve the goal of a plastic-free campus. The figure is given below depicts the plastic management plan.

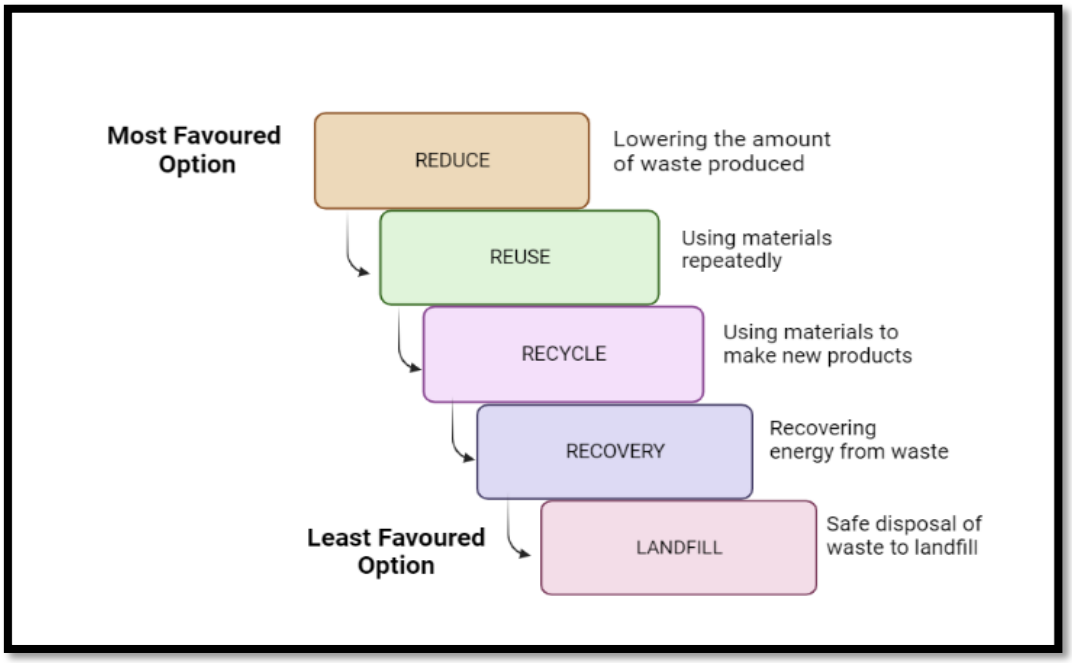


Fig 4.2 Plastic Management Plan for RIE

4.6.3. Biogas Plant

It is recommended to install a biogas plant for solid waste management. A biogas plant is a facility that provides oxygen-free conditions where anaerobic digestion can occur. Simply described, it's a man-made technology that allows waste to be converted into environmentally friendly fertilizers and sustainable electricity.

4.6.3.1. Advantage

The majority of the advantages of biogas plants are environment-related, as they produce renewable energy for domestic and industrial use. This energy can be stored or

injected into the electricity grid to minimize dependence on fossil-fuel energy, which can help reduce our carbon footprint.

In other words, biogas plants can aid in the fight against global warming. Emissions of greenhouse gases decrease as household and industrial consumers depend less on energy generated from fossil fuels. In addition, by collecting organic matter and managing the fermentation process, methane emissions are reduced, leading to better air quality.

Communities' reach these results while managing food waste and preventing garbage from ending up in landfills. In addition to other benefits, recycling organic waste implies fewer odors, a lower chance of disease transmission, and protected water bodies. Another benefit of biogas plants is their ability to substitute synthetic fertilizers with digestate, which eliminates the need for them. It recycles several nutrients, including phosphorus, which is necessary for strong crops.

4.7. Wastewater Management

The wastewater is being drained in the main drainage line of the municipal corporation.

4.7.1. Sewage Treatment Plant

Wastewater and sewage are treated in three stages: primary (solid removal), secondary (bacterial breakdown), and tertiary (extra filtration).Both household and commercial facilities produce sewage. It includes liquid domestic waste that is dumped into sewers from sinks, toilets, baths, showers, kitchens, and other locations. Sewage in many places also contains liquid waste from industry and commerce. In the developed world, it is increasingly typical to separate and drains domestic waste into greywater and blackwater. Greywater is water that is produced during daily chores like laundry, dishwashing, and bathing and is more easily reusable. Blackwater, which contains human waste, is produced by toilets.

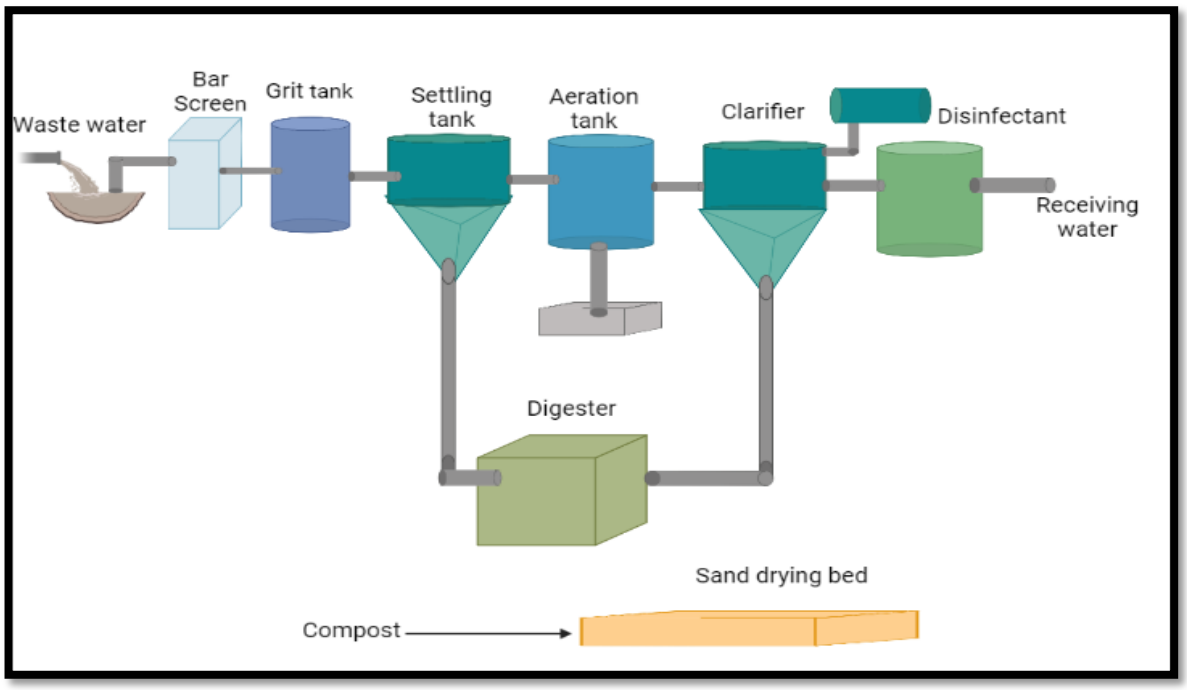


Fig 4.3: Sewage Treatment Plant

a. Primary Treatment

In the primary phases of treatment, sewage is kept in a basin where solids (sludge) can sink to the bottom and oil and lighter substances can rise to the top. The residual liquid can then be sent for secondary treatment after these layers have been removed. Sludge digestion is a distinct procedure used to treat sewage sludge.

b. Secondary Treatment

The removal of dissolved and suspended biological materials during secondary treatment frequently involves the use of microbes in a controlled condition. The majority of secondary treatment systems employ aerobic bacteria, which break down the organic sewage components (sugar, fat, and so on). Some systems use fixed film systems, in which the water travels through filters that have bacteria growing on them. In "activated" sludge, which is used in suspended growth systems, decomposing bacteria are introduced right into the sewage. Since bacteria need oxygen to grow, sewage is frequently mixed with air to speed up decomposition.

c. **Sludge Digestion**

During primary treatment, sewage sludge that was scraped from the bottom of the settling tank is dealt with separately from wastewater. Several methods can be used to dispose of sludge. First, it can be broken down by bacteria; occasionally, bacterial

digestion will result in methane biogas, which can be used to produce power. Sludge may also be condensed, heated to sterilize it, and then used again as fertilizer.

4.7.1.1. Advantages

- Reliable and unlikely to encounter problems with only regular maintenance
- Can be installed even on challenging or compact sites
- Cost-effective over time, with only installation, power, and maintenance to pay for

4.8. Energy Management

Under the energy management plan, a solar power plant is being suggested.

4.8.1. Solar Plant

A solar power plant uses concentrated solar power (CSP) or photovoltaics to convert sunlight directly into energy (CSP). To concentrate a huge area of sunlight into a narrow beam, concentrated solar power systems use lenses, mirrors, and tracking devices. Using the photoelectric effect, photovoltaics transforms light into electric current. In the 1980s, concentrated solar power facilities initially developed. The solar power plant relies on the conversion of solar energy into electrical energy. As solar energy usage has grown in recent years. A solar power plant not only helps us save money on electricity, but it also benefits the environment. It either directly uses photovoltaics to convert solar energy into electricity.

Due to its low cost and ability to generate electricity from sunlight, it is widely used. After understanding how important using solar energy is, more people are using these goods every day. The government is implementing incentive programs as part of its efforts to educate the public about solar technologies. Installing a solar power plant is incredibly advantageous for the entire world as well as the budget. This solar equipment is actively employed and transforms solar energy into a form that may be used to power various appliances.

4.8.1.1. Benefits

Solar energy is created by the combination of silicon solar cells (solar energy). Photons lose electrons from their atoms when they strike the solar cell. When the conductor cell's positive and negative sides are connected, an electrical circuit is

created, and electricity is produced when electrons move through the circuit. There are the following benefits of solar panels:

- **Solar energy is clean & green energy:** When electricity is produced or other forms of energy are used, some pollution occurs, which pollutes the atmosphere. However, the source of solar energy does not present such a challenge.
- **Not dependent on other sources of Energy:** The development of solar energy and its growing use has reduced the demand for other energy sources, which is good news for the environment and the ecology.
- **Non-maintenance**: Solar power systems don't need a lot of maintenance. It only requires cleaning twice a year, however cleaning should always be carried out by professionals who are knowledgeable in this field. Additionally, the system includes inverters that need to be replaced every five to ten years, meaning that very little money is spent on maintenance and repair work in addition to the initial investment.
- **Safer than Other**: Whether used for operation or maintenance and repair, solar electricity is more secure than traditional power sources.
- **Renewable Energy**: One of the sources of renewable energy is solar energy. It is accessible everywhere in the world and is thus always available. Solar power is an endless source of energy.
- **Electricity Bill Reduction**: Solar energy isrelieved of the immense cost of the electricity bill because solar energy will provide all of your energy demands. Your needs will determine how much you can save on your bill.
- **Maximum Usage**: There are many uses for solar energy. Solar energy can be used by anything to produce heat or electricity (solar thermal). It can provide electricity to places without it, be used in factories, provide clean water, be used for household chores, and be used to power space satellites.
- **Technology Development**: Due to the rising use of solar energy, industrial growth has increased and is predicted to continue growing quickly in the future. All in all, solar panel utilization enables you to reduce energy consumption and deal with large electricity bills by utilizing the Sun as a natural energy source.

4.9. Green campus Management

There is enough greenery present in spaces so extra efforts may not be needed for green campus management. However, separate medicinal plant gardens on the campus can be developed.

4.9.1. Build Medicinal plant Gardens in the Premises

Although, there were some medicinal plant species present inside the Biodiversity Park. It is recommended to build a separate garden for medicinal plants named as Medicinal Plants Garden. The plantations of native plants or tree species may be done in a garden. Some plant or tree species suggested for plantations are given in Table 4.1.

Table 4.1: Medicinal Plants or Trees

Sr. No	Botanical Name	Common Name	Habit	Family	Medicinal uses
1.	*Aegle marmelos*	Wood apple	Tree	Rutaceae	Reduced blood cholesterol, anti-inflammatory, anti-diarrhetic, and antidote to snake venom properties of the roots.
2.	*Albizia procera*	Red &white siris	Tree	Fabaceae	All plant components have been associated with anti-cancer properties, and a decoction of the bark is used to cure rheumatism and hemorrhage.
3.	*Aloe succotrina*	Aloe vera	Herb	Aloaceae	Reduce blood glucose levels, anti-aging, relieve heartburn, reduced cholesterol, and natural laxative
4.	*Annona squamosa*	Sugar apple	Shrub	Annonaceae	The root is used to treat dysentery, while a decoction of the bark is used to control diarrhea.
5.	*Artemisia parviflora*	Worm wood	Tree	Asteraceae	It is most frequently used to treat digestive tract diseases and to enhance all digestive functions. It is also reported to have anti-fungal, anti-bacterial, expectorant, and anti-asthmatic qualities.

6.	*Artocarpus heterophyllus*	Jackfruit	Tree	Moraceae	Leaves are used to cure stomach aches, boils, and diarrhea. Like the pulp, seeds are cooling and aphrodisiac. A root decoction can treat asthma, diarrhea, and skin conditions while also lowering fever.
7.	*Bauhinia purpuria*	Butterfly tree	Tree	Fabaceae	Intestinal parasites are controlled using seed powder. Blood cleansing involves the use of flowers and plants.
8.	*Butea monosperma*	Flame of the forest	Tree	Fabaceae	Control Crotch itch, ringworm, edema brought on by any condition (arthritis, moch), sprain, or dysentery, gastrointestinal parasites
9.	*Caesalpinia pulcheminna*	Peacock tree	Shrub	Fabaceae	Reduce LDL cholesterol to prevent cancer and heart disease. The roots, bark, and leaves can all be combined to make a medicinal tea that is used to treat gastrointestinal disorders, jaundice, fever, and kidney and liver disease in patients.
10.	*Calatropispro cera*	Sodoms milk weed	Shrub	Apocyanaceae	Boils, cholera, a cold or cough, rheumatoid arthritis, ringworm, the chicken pox, stomach problems, toothaches, and edema.
11.	*Carica papaya*	Papaya	Tree	Caricaceae	The papaya fruit is high in fibre, which helps with digestion and softens bowel movements. It also includes flavonoids and beta carotene, which protect against macular degeneration. Vitamin A offers a fresh, glowing complexion, protects the skin from infection, and speeds up the healing of wounds.
12.	*Carissa carandus*	Bengal cerrant	Shrub	Apocyanaceae	Fruit contains a considerable quantity of vitamin C and is a good source of iron. Anti-ulcer, anti-inflammatory, anti-diarrheal, anti-anthelmintic, antioxidant, antipyretic, anti-bacterial, hepatoprotective, and anti-diabetic.

13.	*Cassia alata*	Candle bush	Tree	Fabaceae	Antibacterial, antifungal, and anticancer properties are present. The internal use of the laxative leaves and root helps to relieve constipation and purify the blood.
14.	*Cassia fistula*	Golden shower	Tree	Fabaceae	liver protection, reduced inflammation, cough suppression, wound healing, anti-microbial, and relief from constipation
15.	*Catharanthus roseus*	Vinca rosa	Herb	Apocyanaceae	The entire plant is used to treat diabetes, while the leaves are utilized to treat body edema.
16.	*Ceiba pentondra*	White silk cotton tree	Tree	Malvaceae	Used to cure diarrhea, scabies, coughing fits, and hoarse throats. Young leaves are heated and combined with palm oil for intake as a treatment for heart issues.
17.	*Chenopodium ambrosioides*	Warm seed	Herb	Amaranthaceae	Used to rid the body of parasitic worms. The entire plant has analgesic, anti-asthmatic, and carminative qualities. It is also used as a poultice to detoxify poisons like snake bites and other toxins and as a wash for hemorrhoids.
18.	*Cissus quadrangularis*	Devils backbone	Tree	Vitaceae	Anti-oxidant, anti-inflammatory, and act as analgesic. The entire plant has bone-healing/anti-osteoporoticating properties
19.	*Citrus limon*	Lemon tree	Shrub	Rutaceae	Used to treat kidney stones, ringing in the ears (tinnitus), Meniere's illness, the common cold and flu, H1N1 (swine) flu, and scurvy.
20.	*Clerodenrumi nerme*	Glory bowel	Shrub	Verbenaceae	used to treat rheumatism, elephantiasis, asthma, venereal infections, skin conditions, and topical burns.
21.	*Coconut nucifera*	Coconut	Tree	Arecaceae	The seed oil has purgative, hypotensive, emetic, cytotoxic, and emollient properties. Moreover, it is applied as an ointment to keep skin

					soft and supple or to cure rheumatism and back discomfort.
22.	*Erythrina variegate*	Indian coral tree	Tree	Fabaceae	Using the bark's decoction to reduce obesity and relieve gastrointestinal issues Leaves are used to alleviate ear aches and dangerous cholesterol levels in the blood.
23.	*Gliricidia maculate*	Mother ofcocoa	Tree	Fabaceae	The plant is used in folk medicine to treat a variety of conditions, including alopecia, boils, bruises, burns, colds, cough, debility, erysipelas eruptions, fever, fractures, gangrene headaches, itch, prickly heat rheumatism, skin tumours, ulcers, urticaria, and wounds. It also exhibits antifungal activity.
24.	*Hibiscus rosa sinensis*	Chinese rose	Shrub	Malvaceae	Used internally to treat excessive and uncomfortable menstruation, cystitis, venereal infections, febrile illnesses, bronchial catarrh, and coughs, and to encourage hair development.
25.	*Jatropha carcus*	Barbados nut	Shrub	Euphorbiaceae	Haemolytic illness can be treated with roots (oil). The leaves are prepared into a decoction to sterilize newborns' umbilicus and are used to treat colic, syphilis, jaundice, rheumatoid arthritis, fever, and malaria.
26.	*Justicia adhatoda*	Malabar nut	Shrub	Acanthaceae	Bronchiole disorders
27.	*Moringa oleifera*	Moringa	Tree	Moringaceae	Moringa can stimulate the heart and blood flow, and it also has anti-tumor, antipyretic, antiepileptic, anti-inflammatory, anti-ulcer, anti-oxidant, anti-diabetic, antifungal, and antibacterial properties.
28.	*Murrayakoenigii*	Curry leaves	Tree	Rutaceae	Used externally to treat rashes on the skin and deadly animal bites. Dysentery is treated by eating fresh leaves, and vomiting is stopped by drinking a leaf infusion.

29.	*Nerium oleander*	Nerium	Shrub	Apocyanaceae	Cardiotonic, diaphoretic, diuretic, emetic, expectorant, and sternutatory properties are present in the leaves and flowers.
30.	*Ocimumamericanum*	Hoary basil	Herb	Lamiaceae	They are used to treat arthritis, have anti-aging and antibacterial qualities, and can help prevent some forms of skin, liver, mouth, and lung cancer.
31.	*Ocimumbasilicum*	Great basil	Herb	Lamiaceae	Used to treat kidney dysfunction, warts, worms, urinary infections, coughs, diarrhea, and constipation. Basil leaves have potent antiviral, antibacterial, anti-inflammatory, and anti-oxidant qualities.
32.	*Ocimum sanctum*	Tulsi	Tree	Lamiaceae	Tulsi oil is used to fight bacteria and insects. It works well as a treatment for severe, urgent respiratory issues. It aids in the treatment of cholera, hysteria, indigestion, headaches, and malaria.
33.	*Phyllanthus acidus*	Star goose berry	Tree	Phyllanthaceae	Used to treat asthma and skin itch. L eaves can lower fevers.
34.	*Phyllanthus emblica*	Indian goose berry	Tree	Phyllanthaceae	It has immune-modulatory, anti-diabetic, anti-hyperglycemic, anti-lipemic, anti-oxidant, anti-adaptogenic, antacid, demulcent, and digestive stimulant properties. It is also hematogenic (increases hemoglobin level), anti-anemic, anti-inflammatory, anti-cancer, and anti-microbial properties.
35.	*Pongamia pinnata*	Pongam oil tree	Tree	Fabaceae	It is applied externally as a liniment to treat skin conditions and rheumatic joints.
36.	*Psidium guajava*	Guava	Tree	Myrtaceae	Guava leaf extract inhibits pancreatic cholesterol esterase, which lowers cholesterol levels and prevents diabetes. It also possesses analgesic, anti-inflammatory, antimicrobial,

					hepatoprotective, and antioxidant properties.
37.	*Pterocarpus santalinus*	Red sandal wood	Tree	Fabaceae	Used as an antiseptic, to treat burns, and to treat various skin conditions and ailments
38.	*Putranjivaroxburghhi*	Lucky been tree	Tree	Euphorbiaceae	The tree's leaves have cooling, analgesic, and anti-inflammatory properties and are used to cure fever, sterility, and allergic red bumps on the body.
39.	*Rutachalepensis*	Fringed rue	Herb	Rutaceae	The leaf dedication is used to cure colds, fevers, stomachaches, and headaches. Those experiencing fits or convulsions are given leaf juice.
40.	*Santalum album*	Indian sandal wood	Tree	Santalaceae	Widely used in folk medicine to treat a variety of illnesses including bronchitis, liver and gallbladder problems, skin problems, heart problems, general weakness, fever, and infections of the urinary tract.
41.	*Sesbania grandiflora*	Humming bird tree	Tree	Fabaceae	A paste made of roots and bark is used to treat gout and arthritis-related pain and inflammation. Nausea is treated with leaf juice extract. Night blindness, headaches, and throat and mouth infections are all treated with flowers.
42.	*Stachytarphetaurticiflora*	Blue snakeweed	Herb	Verbenaceae	Oral medication used to treat digestive system disorders.
43.	*Tamarindus indica*	Tamarind tree	Tree	Fabaceae	All parts of the plant have therapeutic qualities. Leaf extracts are a frequent element in medications that lower blood sugar and exhibit anti-oxidant effects in humans.
44.	*Terminalia bellerica*	Beleric	Tree	Combretaceae	Useful for treating eye-related issues such as developing cataracts (or) any type of infection, lower blood pressure, and maintaining a healthy cholesterol level. It increases

					nutrients, encourages hair growth, and prevents greying.
45.	*Thespesia populnia*	Pacific rose wood	Tree	Malvaceae	The crushed fruit is used to alleviate abdominal swelling and urinary tract issues. Leaf decoction is used to cure headaches, influenza, and cough. Skin conditions can be treated externally with leaf sap.
46.	*Tinosporacardifolia*	Heart leaves moonseed	Herb	Menispermaceae	Used to treat a variety of conditions including diabetes, high cholesterol, peptic ulcer disease, hay fever, upset stomach, gout, lymphoma and other cancers, rheumatoid arthritis, hepatitis, fever, gonorrhoea, syphilis, and diabetes.
47.	*Vetiveriaziza noides*	Lavancha	Herb	Poaceae	Utilized to cool juice or sharbat. Therapy for a variety of conditions, including diabetes, regular menstruation, blood pressure and heart issues, sleeplessness, muscle and joint discomfort, and circulation issues.
48.	*Withaniasomnifera*	Ashwagandha	Herb	Solanaceae	Root medicine plays a significant role in the treatment of rheumatic pain, cold, and cough in women, normalize high blood sugar & enhances insulin sensitivity for diabetes,
49.	*Zingiber officinale*	Zinger	Herb	Zingiberaceae	Improve muscle strength, boost the immune system, increase physical endurance, and eliminate blood impurities
50.	*Zizipus jujuba*	Indian jujube	Tree	Rhamnaceae	Used as a sedative, to avoid stress ulcers, improve muscle mass and strength, and improve liver and bladder function.

4.10. Management plan for Good Laboratory Practices

Good laboratory practices shall be applied to laboratories. The laboratory practices are given below.

4.10.1. No food or no drink

1. There are numerous risks associated with eating in the lab.
2. First and foremost, eating or drinking while in the lab can raise your chance of exposure to dangerous substances.
3. Food and drink can make a mess, raising the chance of experiment contamination and even attracting pests.
4. Consuming food or beverages while working in the lab might be a distraction that results

4.10.2. Wear PPE and the appropriate lab attire

1. The proper clothing, including a lab coat, gloves, and eye protection, should always be worn in the lab.
2. When working in the lab, long pants and shoes that completely cover the top of the foot should always be worn.
3. Lab coats will shield your skin and clothing from spills, splatters, and other chemical or biological agent exposures, as well as flames in some circumstances.
4. Your eyes will be shielded from physical or chemical injury by safety glasses or goggles. After mild burns or abrasions, your skin will recover, but your eyes won't. Eye injuries can be permanent, yet safety glasses take about three seconds to put on in a spill or other serious event.
5. Gloves prevent your skin from potentially harmful substances that come into encounter with your hands. However, when gloves are taken off and discarded, exposure may occur.

4.10.3. Proper hygiene

1. Before leaving the lab and after handling any potentially harmful materials wash your hands.
2. Separating personal belongings from lab work. By doing so, a potential exposure route will be closed off and harmful reagents will not be distributed.
3. Applying cosmetics in the lab is not permitted. Applying anything on your face poses a danger of exposure, especially near your mouth or eyes.
4. Skin that is dry and cracked might serve as a pathway for exposure. Keeping your hands' skin healthy with lotion will help you avoid exposure.

4.10.4. Use of proper storage Containers

These rules apply to garbage, storage units, and individual containers.

1. Just with acids in metal containers or HF in glass, storing organic solvents in plastic bottles can damage the bottle. Chemicals must be kept in containers made of non-reactive materials.
2. Large quantities of dangerous chemicals must be kept in fire-rated cabinets. Ideal storage for acids and caustics should be in separate, plastic-lined cabinets to avoid any vapors from reacting with the metal housing. Store chemicals that are known to react strongly when mixed separately.
3. Waste is to be stored in non-reactive containers or containers with non-reactive liners, similar to how chemicals should be stored.

4.10.5. Labelling of Workspace

1. The contents of every container should be marked on the label. This is essential so that anyone entering the lab or working nearby will be aware of any potential dangers. Ideally, any label should be placed stating the potential hazards.
2. Any study procedure that poses a specific risk should be marked accordingly.

4.10.6. Maintain Awareness of the Atmosphere

1. A lab may be a highly hectic place. It's critical to pay attention to your surroundings and the activity going on around you.
2. Work with intention. A distraction-filled environment can also be found in labs. It's crucial to pay attention to what you're doing and try to block out distractions when handling dangerous materials.

3. Don't wear headphones. Although it can be soothing to listen to music while performing repetitive tasks, doing so takes away from one of the five senses that are essential for situational awareness. It is possible to miss the sound of a glass container breaking or a colleague's warning if you are unable to hear what is going on around you.

4.10.7. Chemical Waste Disposal

DO'S

- To determine whether your garbage is hazardous, combustible, corrosive, reactive, toxic, or listed waste.
- Choose a location for the accumulation of chemical waste that is out of the way of regular activities, easily recognized, and secure.
- Label "Hazardous Waste" and the precise names of the waste components on each waste container.
- Store trash in appropriate containers with a screw-top lid that is intact.
- Keep waste bins closed unless you are adding waste to them.
- Separate solvents with and without halogens.
- Keep all chemical waste in secondary containment, which could include a dishpan or lab tray. In case of accident or damage, it only needs to hold the largest container's contents. Secondary containment should be provided for incompatible materials.
- Prevent contamination of container exteriors. If necessary, clean the container.

Don't

- Pour solvents or chemicals down the drain.
- Use a fume hood to vaporize chemical waste.
- Abandon chemicals in the laboratory.
- Mix different waste chemicals carelessly
- Throw chemicals into garbage cans as you assess if the waste is hazardous or not.

- Store chemical wastes for an extended period of time. A chemical waste disposal form should be completed when a container is 95% full. A container not yet full should not be held for more than 9 months.

4.10.8. Different color Bins for waste disposal in a laboratory

It is recommended to use four different color bins in a laboratory for laboratory waste disposal

1. The blue color is for plastic waste.
2. The green color is for paper waste.
3. The yellow color is for glass waste.
4. The red color is for hazardous waste.

Fig 4.4: four different color bins for laboratory

4.10.10.Take part in safety practices

1. Make sure that everyone who uses the lab is familiar with its safety features.
2. Make sure everyone is aware of the location of the closest fire extinguisher, first aid kit, and spill kit.
3. Understand how to exit your building and where to go following a rescue.
4. Plan or participate in a yearly evacuation drill.

Chapter 5

Conclusion

5. Conclusion

The campus of the RIE has very well-developed buildings and Infrastructure. The greenery of the campus was very well-developed. The institute has a Science Park and many gardens such as rose, palm, mango, coconut, etc. The institute has well maintained agricultural section. The institute distributes vegetables and fruits to students of RIE. The institute has developed two rainwater harvesting systems on campus. There were big sumps for water storage present on campus. Dedicated persons may hire for water leak detection on campus.

The institute has also a vermicompost and organic compost bed made of dry leaves, cow dung, and worms. With the need for a few management practices in waste and energy management practices, the campus can improve more. Some management practices are given in chapter 4 for a better composting system for biodegradable wastes and installing of Biogas plant in your institute for good solid waste management. And for energy management such as installing solar panels (given in chapter 4) on campus

is recommended. It will help in reducing pollution and reduce grid electricity consumption during peak demand.

Sewage waste treatment plant (given in chapter 4) on campus, which will help in improving wastewater management on campus. Apart from that the institute also needs to develop environmental concerns among the staff and the students of RIE. Overall, the best thing noticed in the green audit observation was that the green campus of the institute was well maintained.

References

1. Weather and Climate - The Global Historical Weather and Climate Data https://tcktcktck.org/india/karnataka/mysore
2. https://en.wikipedia.org/wiki/Regional_Institute_of_Education,_Mysore
3. Gowramma B, Kyagavi G, Karibasamma H, Ramanjinaiah KM (2020) Documentation of Major Medicinal Plants in Sandure of Karnataka, India. Med Aromatic Plants (Los Angeles) 9: 348. doi: 10.35248/2167-0412.20.9.348
4. https://en.wikipedia.org/wiki/Sewage_treatment
5. https://www.homebiogas.com/blog/what-is-a-biogas-plant-and-how-does-it-work/
6. https://en.wikipedia.org/wiki/Solar_panel
7. https://spectro.in/green-audit.html
8. Biodiversity of RIE Mysore Campus (2014) - A Manual by Dr. VareishangTangpu, Academic Programme Coordinator, RIE Mysore.
9. https://en.wikipedia.org/wiki/Good_laboratory_practice
10. https://www.britannica.com/technology/solid-waste-management
11. Hosmani SP. Air quality index in Mysore city, Karnataka state, India. Nature, Environment and Pollution Technology. 2012 Jun;11(2):315-7.
12. Naneet G.M and Vijay Kumar (2017) Case study noise level in Mysore.Civil Engineering Portal. https://www.engineeringcivil.com/case-study-on-noise-level-in-mysore-city.html
13. https://www.accuweather.com/en/in/mysore/204111/weather-forecast/204111.
14. KSPCB Manual Stations- Nov-2022 & Dec-2022

Working Team

From Left to Right: Dr. V. Tangpu, Dr V. Prasad, Dr Sharda Kosankar, MsShahnoor Khan, and Ms. Divya Nakade

FORWORD

The Regional Institute of Education, Mysore (Formerly Regional College of Education) founded on 1st August, 1963, is one of five such institutions established by the National Council of Educational Research and Training (NCERT), New Delhi. The other Institutes are located at Ajmer, Bhopal, Bhubaneswar, and Shillong. The Regional Institutes was established with the goal of improving the quality of school instruction through creative pre-service and in-service teacher preparation program, research, development, and extension initiatives.

The Regional Institute of Education in Mysore has established an image for itself as a reputable institution for teacher and school education. The institute has made an effort to handle the obligations and problems brought on by changes in the country's and the southern region's educational scenario. The Institute has been functioning as the Regional Institute of Education since 1995, following a major shift in its focus from pre-service Education to in- service Education. In this regard, RIE Mysore approached CSIR-NEERI to conduct the green audit study.

The purpose of the green audit was to ensure that, the practices followed on the campus are in accordance with the Green Policy adopted by the institution. The study comprises preparing and filling out a questionnaire, physically inspecting the campus, watching, and reviewing the document, interacting with the people who are responsible, analysing the data, taking measurements, and making recommendations. Based on the observations several recommendations and management plans for water, waste, energy and green campus are given.

The help and cooperation extended by officials of RIE Mysore are gratefully acknowledged.

March, 2023

Nagpur

Director

निदेशक / Director
सी.एस.आई.आर.-राष्ट्रीय पर्यावरण अभियांत्रिकी अनुसंधान संस्थान
CSIR-National Environmental Engineering Research Institute
नेहरू मार्ग/, नागपुर-440 020 (भारत)
Nehru Marg, Nagpur-440 020 (India)