

# PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY

70 Mile stone, Grand Trunk Road, Samalkha, Haryana 132102



## PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Kurukshetra University, Kurukshetra)

# GREEN AUDIT REPORT

(2023-2024)

Audit Done By

## SEEC

SRISHTI ENGINEERING & ENERGY CONSULTANTS



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## CERTIFICATE

PRESENTED TO

**PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY**  
70 Mile stone, Grand Trunk Road, Samalkha, Haryana 132102

Has been Assessed by Srishti Engineering & Energy Consultants for the comprehensive study of Environmental impacts on institutional working framework to fulfill the requirements of

## GREEN AUDIT

The green initiatives carried out by the institute has been verified on the details submitted and was found to be satisfactory.

The efforts taken by the management and the faculty towards environment and sustainability are appreciated and noteworthy



Signature Lead Auditor

Dated: 06.04.2024

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## **DISCLAIMER**

**SEEC Audit Team** has prepared this report for **Panipat Institute of Engineering and Technology** based on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team. While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered. It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report. If you wish to distribute copies of this report external to your organization, then all pages must be included. **SEEC**, its staff and agents shall keep confidential all information relating to your organization and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies. **SEEC** staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

A handwritten signature in black ink is written over a circular official stamp. The stamp is blue and contains the text 'Srishti Engineering &amp; Energy Consultants' around the perimeter and 'Auth. Sign.' in the center. A small star is located at the bottom of the stamp.

Signature

Lead Auditor

## **CONCEPT AND CONTEXT**

The **National Assessment and Accreditation Council, New Delhi (NAAC)** has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures. In view of the NAAC circular regarding Green auditing, the College management decided to conduct an external environment assessment study by a competent external professional auditor. The green audit aims to examine environmental practices within and outside the college campus, which impact directly or indirectly on the atmosphere. Green audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of college environment. It was initiated with the intention of reviewing the efforts within the institutions whose exercises can cause risk to the health of inhabitants and the environment. Through the green audit, a direction as how to improve the structure of environment and inclusion of several factors that can protect the environment can be commenced. This audit focuses on the Green Campus, Waste Management, Water Management, Air Pollution, Energy Management & Carbon Footprint etc. being implemented by the institution.

The purpose of the audit is to identify areas where the institute can improve its sustainability practices and reduce its environmental impact. It also helps universities demonstrate their commitment to sustainability and meet NAAC's accreditation criteria.

## **1.0 Introduction**

The green audit aims to analyze environmental practices within and outside the university campuses, which will have an impact on the eco-friendly atmosphere. Green audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of university environment. It was initiated with the motive of inspecting the effort within the institutions whose exercises can cause threat to the health of inhabitants and the environment. Through the green audit, a direction as how to improve the structure of environment and there are include several factors that have determined the growth of carried out the green audit.

### **1.1 NEED FOR GREEN AUDITING**

Green auditing is the process of identifying and determining whether institutions practices are eco-friendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources like energy, water, are become habitual for everyone especially, in common areas. Now, it is necessary to check whether our processes are consuming more than required resources? Whether we are handling resources carefully? Green audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it in to green and clean one. Green audit provides an approach for it. It also increases overall consciousness among the people working in institution towards an environment.

### **1.2 GOALS OF GREEN AUDIT**

PIET has conducted a green audit with specific goals as:

1. Identification and documentation of green practices followed by university.
2. Identify strength and weakness in green practices.
3. Analyze and suggest solution for problems identified.
4. Assess facility of different types of waste management.
5. Increase environmental awareness throughout campus
6. Identify and assess environmental risk.
7. Motivates staff for optimized sustainable use of available resources.

8. The long-term goal of the environmental audit program is to collect baseline

data of environmental parameters and resolve environmental issue before they become problem.

### **1.3 OBJECTIVES OF GREEN AUDIT**

1. To examine the current practices, which can impact on environment such as of resource utilization, waste management etc.
2. To identify and analyze significant environmental issues.
3. Setup goal, vision, and mission for Green practices in campus.
4. Establish and implement Environment Management in various departments.
5. Continuous assessment for betterment in performance in green

### **1.4 BENEFITS OF GREEN AUDIT TO EDUCATIONAL INSTITUTIONS**

There are many advantages of green audit to an Educational Institute:

1. It would help to protect the environment in and around the campus.
  2. Recognize the cost saving methods through waste minimization and energy conservation.
  3. Empower the organization to frame a better environmental performance.
  4. It portrays good image of institution through its clean and green campus.
- Finally, it will help to build positive impression for through green initiatives the upcoming NAAC visit.

## **2. OBJECTIVE AND SCOPE**

The broad aims/benefits of the eco-auditing system would be

- Environmental education through systematic environmental management approach
- Improving environmental standards
- Benchmarking for environmental protection initiatives
- Sustainable use of natural resource in the campus.
- Financial savings through a reduction in resource use
- Curriculum enrichment through practical experience
- Development of ownership, personal and social responsibility for the College campus and its environment
- Enhancement of College profile
- Developing an environmental ethic and value systems in young people



### **3.0 EXECUTIVE SUMMARY**

An environmental audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. This audit report contains observations and recommendations for improvement of environmental consciousness.

### **4.0 METHODOLOGY**

In order to perform green audit, the methodology included different techniques such as physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following area to summarize the present status of environment management in the campus:

- Water consumption and management
- Air quality assessment and management
- Electricity consumption and management
- Sound pollution monitoring
- Waste management
- Biodiversity status of the campus

#### 4.0 Water Consumption & Management

Total Number of Water Taps in the Campus

Sr. No.	Location	Description	UOM	Water Taps
1	Block A	Drinking water tap	Nos	7
2		Taps in toilet	Nos	36
3		Urinal taps	Nos	9
4		Flush	Nos	12
5		Laboratory	Nos	22
6	Block B	Drinking water tap	Nos	5
7		Taps in toilet	Nos	34
8		Urinal taps	Nos	5
9		Flush	Nos	10
10		Laboratory	Nos	5
11	Block C	Drinking water tap	Nos	6
12		Taps in toilet	Nos	38
13		Urinal taps	Nos	10
14		Flush	Nos	14
15		Laboratory	Nos	29
16	Block D	Drinking water tap	Nos	4
17		Taps in toilet	Nos	74
18		Urinal taps	Nos	29
19		Flush	Nos	25
20	Block E	Drinking water tap	Nos	7
21		Taps in toilet	Nos	75
22		Urinal taps	Nos	30
23		Flush	Nos	26
24	Boys Hostel-old	Drinking water tap	Nos	7
25		Taps in toilet	Nos	128
26		Urinal taps	Nos	0
27		Flush	Nos	28
28	Boys Hostel-New	Drinking water tap	Nos	4
29		Taps in toilet	Nos	126
30		Urinal taps	Nos	1
31		Flush	Nos	24
32	Workshop & Labs	Drinking water tap	Nos	2
33		Taps in toilet	Nos	11
34		Urinal taps	Nos	0
35		Flush	Nos	0
36	Admin Block	Drinking water tap	Nos	1
37		Taps in toilet	Nos	14
38		Urinal taps	Nos	3
39		Flush	Nos	4

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40	Net Café	Drinking water tap	Nos	0
41		Taps in toilet	Nos	12
42		Urinal taps	Nos	2
43		Flush	Nos	4
44	Mess	Location (Mess)	Nos	10
45	Football Ground	Drinking water tap	Nos	3
46		Taps in toilet	Nos	7
47		Urinal taps	Nos	2
48		Flush	Nos	1
49	Open Gym Canteen	Water tap	Nos	2
50	Nursery near C Block	Water tap	Nos	2
51	Back side of Hostel	Water tap	Nos	2
52	S.T.P.	Water tap	Nos	3
53	Girls Hostel	Drinking water tap	Nos	4
54		Taps in toilet	Nos	122
55		Flush	Nos	26
<b>Total</b>			Nos	<b>1067</b>

**Comments**

**Approximate per capita average consumption and usage per day is 27.2 L of water.**

**4.0 Water Storage Profile**

Sr. No.	Location	Qty.	Storage Capacity (Litres)	Total Capacity (Litres)
1	Canteen	1	5000	5000
		1	2000	2000
2	Old Boys Hostel	1	5000	5000
		2	2000	4000
		2	1000	2000
3	New Boys Hostel	3	5000	15000
		1	1500	1500
		1	2000	2000
4	Girls Hostel	2	2000	4000
		1	1000	1000
5	Guest House	2	2000	4000
6	E- Block	1	5000	5000
		1	3000	3000
		2	1000	2000
7	D- Block	1	5000	5000
		1	3000	3000
8	A - Block	1	1000	1000
		2	2000	4000
9	Admin Block	2	2000	4000
		1	1000	1000
		1	1000	1000
10	B - Block	1	5000	5000
		1	1000	1000
11	C - Block	2	2000	4000
		1	1000	1000
12	A - Block Main Gate	1	1000	1000
13	Main Gate	1	1000	1000
<b>Total</b>				<b>88000</b>

## 5.0 Air Quality Monitoring

Air quality monitoring is the process of assessing the quality of air in different locations by measuring air pollutants and other parameters. The goal is to understand how air quality is changing over time and to identify trends and patterns. This information can be used to improve air quality, protect public health, and comply with regulations. It can also help researchers study the health effects of air pollution, monitor climate change, and support research and development. The most important air quality parameters which are measured are Humidity, PM 2.5 & PM 10. The other criteria pollutants such as ozone, carbon monoxide, Nitrogen dioxide, Sulfur dioxide and lead are not measured as there are no major industries nearby the institute. Noise equally plays a vital role in the environment.

Months	PM 2.5 ( $\mu\text{g}/\text{m}^3$ )	PM10 ( $\mu\text{g}/\text{m}^3$ )	Humidity (%)
September 2023	22.2	46.5	69.0
October 2023	26.7	49.1	56.0
November 2023	29.5	55.7	47.2
December 2023	29.1	60.1	46.6
January 2024	26.9	52.8	53.6
February 2024	27.2	49.3	46.5
March 2024	28.1	51.8	50.1

## 6.0 Electricity Details (in Units)

As per the details received from the UHBVN

<b>Month</b>	<b>Unit Consumption (kWh)</b>	<b>Solar Plant Generation (kWh)</b>
January 2023	24747	39060
February 2023	49170	24850
March 2023	60590	41720
April 2023	38391	19530
May 2023	221334	48580
June 2023	94515	18550
July 2023	310728	46900
August 2023	88850	13230
September 2023	259270	38430
October 2023	166736	21140
November 2023	495928	19740
<b>Total</b>	<b>1810259</b>	<b>331730</b>

## 7.0 Sound Pollution Monitoring

The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound, (1) loudness and (2) frequency. Loudness is the strength of sensation of sound perceived by the individual. It is measured in terms of Decibels. Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-75 dB, boiler factories 120 dB, jet planes during take-off is about 150 dB, rocket engine about 180 dB. The loudest sound a person can stand without much discomfort is about 80 db. Sounds beyond 80 dB can be regarded as pollutant as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city to avoid sleep disturbances. For international standards a noise level up to 65 dB is considered tolerable. Frequency is defined as the number of vibrations per second. It is denoted in Hertz (Hz). Sound pollution is another important parameter that is taken into account for green auditing of the College Campus. Different sites were chosen for the monitoring purpose.

Sr No.	Location	Max. dBA.	Min. dBA.
1	Girls entry gate	49	41
2	Girls hostel badminton area	55	47
3	Girls hostel corridor ground floor	44	33
4	Girls hostel corridor first floor	46	37
5	Girls hostel corridor second floor	38	30
6	Girls hostel corridor third floor	41	29
7	Girls hostel room ground floor	42	29
8	Girls hostel room first floor	49	41
9	Girls hostel room second floor	51	47
10	Girls hostel room third floor	43	41
11	Old guest house	39	35
12	Cow shelter	60	56
13	Laundry	65	58
14	Old boys hostel corridor ground Floor	51	47

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15	Old boys hostel corridor first floor	53	46
16	Old boys hostel corridor second floor	49	42
17	Old boys hostel corridor third floor	45	41
18	Old boys hostel room ground floor	47	43
19	Old boys hostel room first floor	51	41
20	Old boys hostel room second floor	39	31
21	Old Boys Hostel Room third floor	38	32
22	Pole light 100 watt	29	21
23	Store room	25	21
24	Kitchen	28	23
25	Canteen ground	33	30
26	Canteen first floor	39	35
27	Block A corridor ground floor	23	21
28	Block A corridor first floor	22	20
29	Block A corridor second floor	20	20
30	Block A corridor third floor	20	20
31	Admin block reception	40	38
32	Central library	28	27
33	Admin block first floor lobby	25	25
34	Security office	30	24
35	DG Room area	36	32



## 8.0 Waste Disposal

Waste disposal include the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process.

Waste can be solid, liquid, or gas, each type has different methods of disposal and management. Waste management deals with all types of waste, including industrial, biological and household. In some cases, waste can pose a threat to human health. Waste is produced by human activity, for example, the extraction and processing of raw materials. Waste management is intended to reduce adverse effects of waste on human health, the environment or aesthetics.

Waste management practices are not uniform among countries (developed and developing nations) regions (urban and rural areas), and residential and industrial sectors can all take different approaches. A large portion of waste management practices deal with municipal solid waste which is the bulk of the waste that is created by household, industrial, and commercial activity.



Panipat Institute of Engineering and Technology has employed waste bins for proper segregation of solid wastes in the campus.

Number of dustbins at college listed below:

Sr. No.	Location	UOM	No. of Dustbin
1	Block A	Nos	5
2	Block B	Nos	5
3	Block C	Nos	6
4	Block D	Nos	9
5	Block E	Nos	11
6	Old Hostel	Nos	6
7	New Hostel	Nos	9
8	Admin Block	Nos	2
9	Open Ground	Nos	71
<b>Total</b>			<b>124</b>

Along with the number of dustbins placed in the campus, the data of the total solid waste generated and managed by the institution is also provided which is mentioned as follows-

Sr. No.	Location	Area	UOM	QTY.
1	Block A	Ground floor	Kg/Month	94.7
2		First floor	Kg/Month	84.5
3		Second floor	Kg/Month	7.7
4	Block B	Ground floor	Kg/Month	111.2
5		First floor	Kg/Month	63.1
6		Second floor	Kg/Month	20.3
7	Block C	Ground floor	Kg/Month	87.4
8		First floor	Kg/Month	45.2
9		Second floor	Kg/Month	71.5
10	Block D	Ground floor	Kg/Month	119.9
11		First floor	Kg/Month	75.8
12		Second floor	Kg/Month	59.9
13		Third floor	Kg/Month	78.4
14		Fourth floor	Kg/Month	22.3

15	Block E	Ground floor	Kg/Month	162.4
16		First floor	Kg/Month	174.4
17		Second floor	Kg/Month	28.4
18		Third floor	Kg/Month	63.8
19		Fourth floor	Kg/Month	67.3
20	Old Hostel	Ground floor	Kg/Month	156.5
21		First floor	Kg/Month	144.5
22		Second floor	Kg/Month	57.6
23		Third floor	Kg/Month	76.8
24	New Hostel	Ground floor	Kg/Month	60.0
25		First floor	Kg/Month	125.9
26		Second floor	Kg/Month	68.3
27		Third floor	Kg/Month	96.8
28		Fourth floor	Kg/Month	87.4
29	Ground	In front of boys' Hostel	Kg/Month	69.0
30		Workshop	Kg/Month	13.2
31		Nescafe	Kg/Month	129.5
32		Front of D Block	Kg/Month	33.7
33		Back of A Block	Kg/Month	68.2
34		Small Canteen	Kg/Month	76.5
35		Parking	Kg/Month	52.4
36		Admin Front	Kg/Month	24.8
37		Basketball Ground	Kg/Month	56.0
38		Library	Kg/Month	9.8
39		O.A.T.	Kg/Month	40.1
40		Front E Block	Kg/Month	24.1
41		Side of A Block	Kg/Month	30.1
42		Between B & C Blocks	Kg/Month	8.6
43	Hostel Mess	Faculty Mess	Kg/Month	12.7
44		Mess	Kg/Month	180.7
45		Canteen	Kg/Month	99.0
46		Tipsy	Kg/Month	188.6
47	Girls Hostel	Ground floor	Kg/Month	54.0
48		First floor	Kg/Month	24.3
49		Second floor	Kg/Month	31.5
50		Third floor	Kg/Month	25.8
<b>Total</b>				<b>3564.5</b>

## **9.0 Biodiversity status of the college campus**

### **Introduction**

Panipat Institute of Engineering and Technology situated in the vicinity of farms and agricultural areas is rich in biodiversity. To conserve this biodiversity, our first need is to learn about the existing diversity of the place. Unless we know whom to conserve, we will not be able to plan proper conservation initiatives. Also, it is important to have an understanding of the bio-diversity of an area so that the local people can be aware of the richness of bio-diversity of the place they are living in and their responsibility to maintain that richness.

In today's world, among the popular conservation measures which are taken to spread wildlife and environmental awareness, butterfly gardens can be placed in a significant position. To create butterfly garden, we need to know which associate plants and other fauna are present in the surrounding. This study allows us to understand the faunal and floral diversity of the surrounding areas of the college premises and their inter-relationship.

### **Objectives**

The main objective of this study is to get a baseline data of bio-diversity of the area which will include:

- Documentation of the floral diversity of the area, its trees, herbs, shrubs and climbers.
- Documentation of the major faunal groups like mammals, reptiles, amphibians, birds and butterflies.
- Documentation of the specific interdependence of floral and faunal life.

### **Method of Study**

Brief methodology for the floral and faunal survey is given below.

9.1 Sampling was done mostly in random manner.

9.2 The total area was surveyed by walking at day time.

9.3 Surveys were conducted for the maximum possible hours in day time.

- 9.4 Tree species were documented through physical verification on foot.
- 9.5 For faunal species we emphasized mainly on the direct sighting. Also call of various birds and amphibians and nesting of some faunal species were considered as direct evidences.
- 9.6 Observing mammals depend critically on the size of the species and its natural history. Diurnal species are common and highly visible. Nocturnal species, however, are rare and difficult to detect. Small mammals like the field rats were found near their burrows, particularly during their entry or exit times in or out from their burrows respectively. In some cases, dung deposits and footprints were also observed that served as a potential clue for the presence and absence of the concerned species. These secondary evidences were all noted with time and space co-ordinates.
- 9.7 Birds are often brightly colored, highly vocal at certain times *of the year* and relatively easy to see. Sampling was done on the basis of direct sighting, call determination and from the nests of some bird species.
- 9.8 Reptiles were found mostly by looking in potential shelter sites like the under surface of rocks, logs, tree hollows and leaf litter and also among and underneath the hedges. Sometimes some species, particularly the garden lizards were also observed in open spaces (on twigs and branches and even on brick constructions) while they were basking under direct and bright sunlight.
- 9.9 Amphibians act as potential ecological indicators. However, most of them are highly secretive in their habits and may spend the greater part of their lives underground or otherwise inaccessible to biologists. These animals do venture out but typically only at night. They were seen near pond, road beside wetland and in other possible areas. Diurnal search

operations are also *successful*.

9.10 Active invertebrates like the insects require more active search. For larger winged insects like butterflies, random samplings were carried and point sampling was also done.

9.11 The easiest way to observe many of the invertebrates is simply looking for them in the suitable habitat or microhabitat. Searching was carried out under stones, logs, bark, in crevices in the walls and rocks and also in leaf litter, dung etc. Slugs and snails are more conspicuous during wet weather and especially at night when they were found using a torch.

### **Faunal Species**

*Number of Faunal species observed: 40*

The list of Fauna indicates that the college campus is significantly rich in faunal diversity. We have seen a significant number of bird nests at many places. We have not been able to document other insect groups during this survey. The yearlong survey will add some more fauna in the checklist for sure after the seasonal survey.

#### **Table 01: Checklist of Faunal groups with species number**

1.	Birds	15	Table-2
2.	Reptiles	1	Table-3
3.	Amphibians	2	Table-4
4.	Butterflies	22	Table-5

#### **Table 02: Checklist of Birds**

No.	Common Name	Scientific Name	Family
1	Common Hawk Cuckoo	Hierococcyx varlus	Cuculidae
2	Common Hoopoe	Upupa epops	Upupidae
3	Common Iora	Aegithirna tipsia	Aegithinidae
4	Common Kingfisher	Alcedo atthis	Alcedinidae

5	Common Myna	Acridotheres tristis	Sturnidea
6	Common Pigeon	CoInmba livia	Columbidae
7	Common Sandpiper	Actitis hypoleucos	Scolopacidae
8	Common Tailorbird	Orthotomus sutortus	Cisticolidae
9	Coppersmith Barbet	Megalaima haemacephala	Ramphas tidae
10	House Crow	Corvus splendens	Corvidae
11	House Sparrow	Passer domesticus	Passeridae
12	Indian Cormorant	Phalacrocorax fuscicollis	Phalacrocoracidae
13	Pale-billed Elowerpecker	Dicoeum erythrorhynchus	Dicaeidae
14	Taiga flycatcher	Ficedula albicilla	Muscicapidae
15	Yellow-footed Green Pigeon	Treron phoenicoptera	Columbidae

**Table 03: Checklist of Reptiles**

No.	Common Name	Scientific Name	Family
1.	Rat Snake	Zamenis longissimus	Colubridae

**Table 04: Checklist of Amphibians**

No.	Common Name	Scientific Name	Family
1	Indian Toad	Duttaphrynus melanostictus	Bufoinae
2	Frog	Enphidictis cyanophlyctis	Dicoglossidae

**Table 05: Checklist of Butterflies**

No.	Common Name	Scientific Name	Family
1	Blue Mormon	Papilio polymnestor	Papilionidae
2	Common Jay	Graphium doson	Papilionidae
3	Common Mime	Papilio clytia	Papilionidae
4	Common Mormon	Papilio polytes	Papilionidae
5	Common Rose	Pachliopta aristolochiae	Papilionidae

6	Lime Butterfly	Papitto demolis	Papilionid ae
7	Tailed Jay	Graphium agamemnon	Papilionid ae
8	Small Grass Yellow	Furema brigitta	Pieridae
9	Common Grass Yellow	Eurema hecabe	Pieridae
10	Common Gull	Cepora nerissa	Pieridae
11	Indian Jezebel	Delias eucharis	Pieridae
12	Indian Wanderer	Pareronia hippia	Pieridae
13	Lemon Emmigrant	Catopsila Pomona	Pieridae
14	Mottled Eemigrant	Catopsilia pyranthe	Pieridae
15	Psyche	Leptosia nina	Pieridae
16	Common Cerulean	Jamides celeno	Lycaenida e
17	Common Lineblue	Prosotosnora	Lycaenida e
18	Tailless Lineblue	Prosotas dubiosa	Lycaenida e
19	Common Pierrot	Castalius rosimon	Lycaenida e
20	Common Quaker	Neopithecops zalmora	Lycaenida e
21	Dark Grass Blue	Zizeeria karsandra	Lycaenida e
22	Forget-me-not	Catochrysops strabo	Lycaenida e

**Floral species:*****Number of Floral species observed: 125***

The list of Flora indicates a significant diversity of plants which indicates the overall richness of the place. We have classified the overall flora in 8 groups. The most diverse group is the tree whereas there are 1 species of ornamental plant which shows the least diversity.

**Table 06: Checklist of Floral groups with species number**

1	Trees	14	Table 7
2	Grasses	2	Table 8
3	Herbs	36	Table 9
4	Shrubs	28	Table 10



5	Creepers	24	Table-11
6	Ornamental Plants	1	Table 12
7	Palms	7	Table 13
8	Fern & Season flower	13	Table-14

**Table 7: Checklist of Trees**

No.	Common Name	Scientific Name	Family
1	Ficus	Ficus Sp.	Moraceae
2	Amla	Emblica officinalis	Euphorbiaceae
3	Guava	Psidium guajava	Myrtaceae
4	Rosemallows	Hibiscaceae	Hibiscus
5	Champaca	Magnolia champaca	Magnoliaceae
6	Cycas	Cycas	Cycadaceae
7	Crepe Jasmine	Tabernaemontana Divaricata	Apocynaceae
8	pomegranate	Punica granatum	Punicaceae
9	Ashoka Tree	Saraca asoka	Fabeceae
10	Kadam	Anthocephalus chinensis	Rubiaceae
11	Indian Almond	Terminalia catappa	Combretaceae
12	Lichi	Litchi chinensis	Sapindaceae
13	Vilayati Babul	Pithecolobium dulce	Mimosaceae
14	Neem Tree	Azadirachta indica	Meliaceae

**Table 8: Checklist of Grasses**

No.	Common Name	Scientific Name	Family
1	Common Carpetgrass	Axonopus sp.	Poaceae
2	Durba	Cynodon dactylon	Graminae

**Table 9: Checklist of Herbs**

No.	Common Name	Scientific Name	Family
1	Curry tree	Murraya koenigii	Rutaceae

2	White cedar	Thuja occidentali	Cupressaceae
3	Banyan tree	Ficus benghalensis	Moraceae
4	Yellow oleander	Cascabela thevetia	Apocynaceae
5	Aloe vera	Aloe vera	Asphodelaceae
6	Barberry	Berberis vulgaris L	Berberidaceae
7	Lemon	Citrus Limonum	Rutaceae
8	China rose	Hibiscus rosa-sinensis	Malvaceae
9	Neem	Azardirchata - indica	Mahaceae
10	Tulsi	Ocimum sanctum	Lamiaceae
11	Toon	Toona sinensis	Meliaceae
12	Ashok	Saraca Asoca	Caesalpinaceae
13	Amla	Emblica officinalis	Euphorbiaceae
14	Henna/mehndi	Lawsennia iermis	Lytharaceae
15	Marigold	Tagetes erecta	Asteraceae
16	Tej Patta	Cinnamomum tamala	Lauraceae
17	Arjun	Terminalia arjuna	Combretaceae
18	Aswagandha	Withania Somnifera	Solanaceae
19	Jamun	Syzygium cumini	Myrtaceae
20	Candyleaf	Stevia rebaudiana	Asteraceae
21	Tamarind (Imli)	Tamarindus indica	Fabaceae
22	Drumstick-Tree	Moringa oleifera	Moringaceae
23	Kachnar	Bauhinia variegata	Fabaceae
24	Lemon grass	Cymbopogon citratus	Poaceae
25	Safed aak	Calotropis Gigantea	Apocynaceae
26	Datura (Yellow)	Datura stramonium	Solanaceae
27	Datura (Black)	Datura stramonium	Solanaceae
28	Red oleander	Cascabela thevetia	Apocynaceae
29	Sudarshana	Crinum latifolium	Amaryllidaceae
30	Kapur	Cinnamomum camphora	Lauraceae
31	Babri	Eclipta prostrata	Asteraceae
32	Common guava	Psidium guajava	Myrtaceae
33	Rose	Rosa rubiginosa	Rosaceae
34	Bakaian	Melia azedarach	Mahogany
35	Rangoon creeper	Quisqualis indica	Combrataceae
36	Bael (Wood apple)	Aegle marmelos	Rutaceae

**Table 10: Checklist of Shrubs**

No	Common Name	Scientific Name	Family
1	Giant Milkweed	Calotropis gigantea	Asclepiadaceae
2	Ban jamir	Glycosmis pentophylla	Ruraceae
3	Fever tea	Lippia javanica	Verbenaceae
4	Fever tea	Lippia javanica	Verbenaceae
5	Jasmine	Jusm inum pubescens	Oleaceae
6	Clerodendrum	Clerodendrum viscosum	Verbenaceae
7	Ground Fig	Ficus heterophylla	Moraceae
8	Bleeding Heart	Clerodendrum tiomsoniae	Lamiaceae
9	Stinking Cassia	Cassio tora	Fabaceae
10	Chitrak	Plumbago zeyla nica	Plumbaginacea e
11	Duranta	Duranta repens	Verbenaceae
12	Garden Cosmos	Cosmos bipinna tus	Asteraceae
13	Devil's Trumpets	Datura sp.	Solanaceae
14	Dracaena	Pleomele reflea	Asparagaceae
15	Lagerstroemia	Lagerstroemia indica	Lythraceae
16	Citrus/Citron	Citrus me dica	Rutaceae
17	Rose	Rosa sp. Var.	Rosaceae
18	Wild Pmumeria	Plumeria pudica	Apocynaceae
19	Wild Eggplant	Solanum Totvum	Solanaceae
20	Indian heliotrope	Heliotropium indiciim	Boraginaceae
21	Heliconia	Strelitzia sp.	Musaceae
22	Common Wireweed	Sida acuta	Malvaceae
23	Thuja	Thuja orientalis	Cupressaceae
24	Chinese Rose	Hibiscus rosa - sinensi's	Malvaceae
25	Lime	Citrus acida	Rutaceae
26	Orange Jasmine	Mnrraya paniculata	Rutaceae
27	Oleander	Nerium oleander	Apocynaceae
28	Karipata	Murraya Koenigii	Rutaceae

**Table 11: Checklist of Creepers**

No.	Common Name	Scientific Name	Family
1	Aparajita	Clitoria ternatea	Fabaceae
2	Birdfoot Grape-Vine	Cayratia pedata	Vitaceae
3	Passion Flower	Passiftora suberosa	Passifloraceae
4	Cayratia	Coratia trifolia	Vitaceae
5	Corkystem	Passiflora sube rosa	Passiflozaceae

	Passionflower		
6	Birdfoot Grape-Vine	Cayratia sp.	Vitaceae
7	Gulanchalata	Tinospora cordifolia	Menispermaceae
8	Titakunja	Wattakaka votubillis	Asclepiaceae
9	Bengal Trumpet Vine	Thunbergia grandiflora	Acanthaceae
10	Ipomoea	Ipomoea aquatic	Convolvulaceae
11	Indian Stinging Nettle	Tragia involucrata	Euphorbiaceae
12	Money Plant, Ivy Arum	Epipremnum aureum	Areceae
13	Snake Vine	Stephania japonica	Menispermaceae
14	Philodendron	Philodendron sp.	Areceae
15	Chinese creeper	Micania microntha	Asteraceae
16	White Morning Glory	Ipomoea obscura	Convolvulaceae
17	Telakuchu	Coccinia grandis	Cucurbitaceae
18	Tiliacora	Tiliacora racemosa	Menispermaceae
19	Roundleaf Bindweed	Evolvulus Nummularius	Convolvulaceae
20	Justicia	Justicia simplex	Acanthaceae
21	Hemigraphis	Hemigraphis hirta	Acanthaceae
22	Climbing Mallotus	Mallostus repandus	Euphorbiaceae
23	Bougainvillea	Bougainvillea sp.	Nyctaginaceae
24	Allamanda	Allamanda sp.	Apocynaceae

**Table 12: Checklist of Ornamental Plant**

No.	Common Name	Scientific Name	Family
1	Dracena (Red)	Dracena nathatma	Liliaceae

**Table 13: Checklist of Palms**

No.	Common Name	Scientific Name	Family
1	Areca Palm	Dyopsis Intescens	Areceae
2	Bottle Palm	Hyophorbe lagenicaulis	Areceae

3	Indian Datepalm	Phoenix sylvestris	Palmae
4	Coconut	Cocos nucifera	Arecaaceae
5	Palmyra Palm	Borassus flabellifer	Palmae
6	Areca	Areca catechu	Arecaaceae
7	Palmyra Palm	Borassus flabellifer	Arecaaceae

**Table 14: Checklist of Ferns and Seasonal Flowers**

No.	Common Name	Scientific Name	Family	Type
1	Bird-nest Fern	Asplenium Sp.	Aspleniaceae	Fern
2	Fishtail Fern	Microsorium punctatum	Polypodiaceae	Fern
3	Oakleaf Fern	Drynoria quercifolia	Polypodiaceae	Fern
4	Snapdragon	Antirrhinum majus	Scrophulariaceae	Seasonal
5	Garden stock	Matthiola incana	Brassicaceae	Seasonal
6	Gazania	Gazania sp.	Asteraceae	Seasonal
7	Gladiolus	Gladiolus sp.	Iridaceae	Seasonal
8	Flaming Katy	Kalanchoe blossfeldiana	Crassulaceae	Seasonal
9	Madam Pink	Dianthus deltoides	Caryophyllaceae	Seasonal
10	Amaryllis	Hippeastrum Sp	Amaryllidaceae	Seasonal
11	Pansy	Viola tricolor var.	Violaceae	Seasonal
12	Petunia	Petunia hybrida	Solanaceae	Seasonal
13	Verbena	Veronica sp.	Verbenaceae	Seasonal

**Conclusion:**

**Biodiversity status of college campus found satisfactory.**

## 10.0 Suggestions and Recommendations

- The college campus is no doubt bio diversified but more plantations especially medicinal plantations are required in the campus. Plantation of more fruit plants will attract more birds.
- There is need to upgrade green monitoring committee activities. The priority of this body is to maintain the greenery of the college campus.
- The green monitoring team should consist of more members from students and if possible also try to include some local interested people.
- Sustainable use of resource and ecology balance of the college campus must be maintained through the year.
- Sound and air quality monitoring should be done on regular basis.
- The prolific use of insecticides/pesticides should be checked as these harmful chemicals are detrimental and instrumental for killing of insects/butterflies which are natural prey for the birds.
- Enact stricter laws to control the capture or exploitation of females of any endangered species and enforce them.
- Environmental parameters shall be included in purchase policy to achieve a cradle to grave approach for sustainability.
- Increase the capacity of solar PV so that it can fulfil at least 70% of the electricity requirement
- Water Meter should be installed at every building of institute for monitoring of water consumption per capita.
- Borewell permission should be taken from authorized government department
- College should start drip irrigation to save water in campus
- College should increase the use of Sprinklers gardening purpose
- Flow rate of taps should be checked; it should not be more than 2.5 litres / minute.
- Increase plantation drives in nearby villages, local bodies, NGO and Municipal Corporation in order to balance the carbon emission and absorption.
- Arrange training programmes on environmental management system and

nature conservation for schools and local people.

- College should initiate a practice where all guests should be given a planter as a gift rather than a bouquet of flowers. Also, plantation should be carried out in nearby villages as a major sustainable drive.
- Involve lower hierarchy staff in environmental awareness programmes and campaigns.
- Messages should be displayed at various locations to Aware the People about Energy Savings
- Green building guidelines for future expansion projects of the campus.



# THANKS

