

Green Audit Report

2018-19



Gauhati University
Guwahati-781029, India

July 2019

Preface

In its pursuit for improving environmental quality and to maintain a pristine environment for, Gauhati University has made a self-inquiry on the environmental quality of the campus. The first status report was prepared for the year 2017-2018 in which several recommendations were made, the foremost of which was to have periodic green audit to improve upon the overall environmental health of the campus. Following this, the Gauhati University authority formed an Environmental/Green Audit Committee for the year 2018-2019 with its mandate to prepare the second green audit report. The Committee deliberated on various relevant issues in the campus and suggested a series of measures which are under different stages of implementation. It is heartening to note that with continued effort of the university administration, tangible, incremental progress has been made on various environmental parameters.

In continuation with our attempt to document the status of the environment and the activities of the Gauhati University community, this report is a compilation of records as well as presentation of snapshots on our commitment towards a green and eco-friendly environment. It has drawn data/information freely from the earlier report while adding new data and analysis. The report was drafted by a subgroup, comprising Dr. Ratul Mahanta, Dr. Dhrubajyoti Saharia, Dr. Debasish Borbora and Dr. Ranjit Thakuria with inputs from a group of students/research scholars engaged for data collection and from various other stakeholders. However, the information in some environmental parameters was inadequate and comments in those areas are only indicative and may need further validation. In spite of the inherent limitations, however, this compilation provides an insight of the status of the environment in the campus and the practices that point more towards what needs to be done further for a better and sustainable campus environment.

Prof. H. P. Sarma, Hon'ble Rector, GU and Head, Department of Environmental Science who internally evaluated the first draft of the report, made useful Comments/suggestions. Insightful remarks and suggestions by Dr. K. C. Bhat-acharyya, former Director, North East Space Application Centre (NESAC, DOS, Shillong) who evaluated the draft report as an external reviewer, were useful in improving the draft report.

**Environmental/Green Audit Committee for the year
2018-2019
(w.e.f. 29/09/2018)**

**vide Memo No. GU/M/18/6325-6340 dtd. 29/08/2018, Gauhati
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1 Introduction

Gauhati University is located at the southern bank of the Brahmaputra and towards the northern edge of the Shillong plateau. The main campus spread over an area of ~ 508.8 acres (1539 bigha, as per land record) between Jalukbari traffic point in the east and Satmile point towards the west (Figure 1). A small satellite area of about 1 acre (3 bigha) is available just across the Jalukbari traffic junction towards the east and another small setup is developed in the main city center at Ambari area. The main campus is characterized by low lying residual hills towards the south and a number of wetlands towards the north with intervening high ground thus making it a picturesque landscape suitable for a wide spectrum of terrestrial and aquatic flora and fauna. The university has 45 PG Departments, 5 UG departments and 6 centers of studies with 53 PG courses and 27 distance mode courses. A total of 3594 students enrolled in the PG courses at Gauhati University in the session 2018-19 while as many as 2,69,783 students were enrolled in UG courses in the 332 affiliated colleges during 2017-2018.

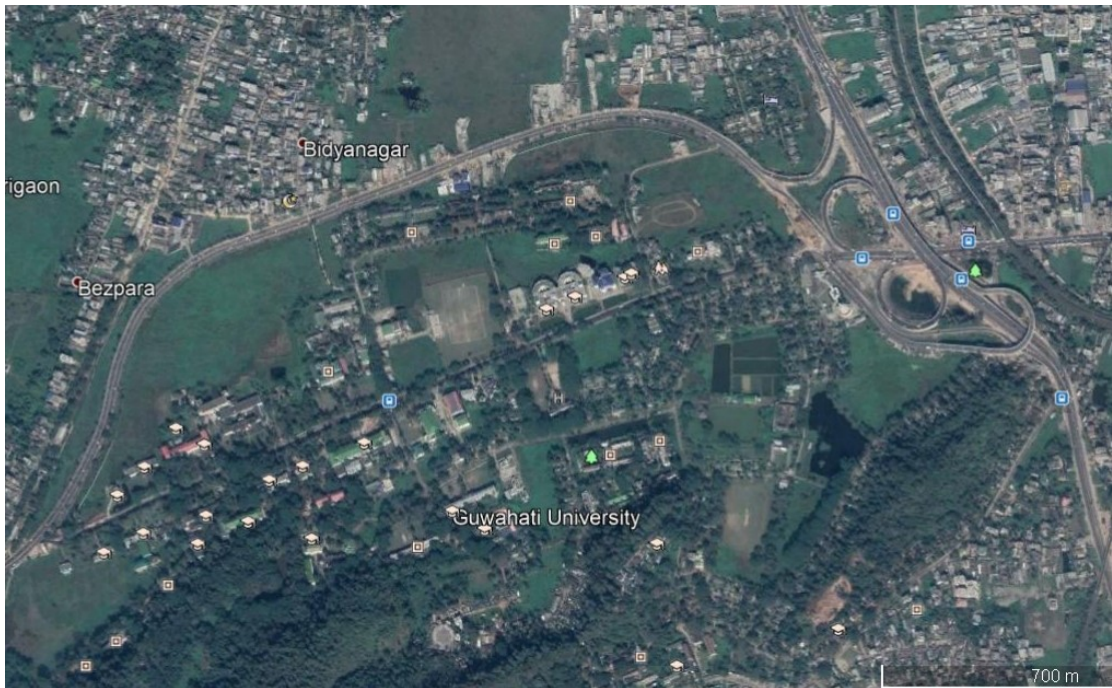


Figure 1: A recent satellite image showing the Gauhati University campus. The National Highway 27 which is visible in the image acts as the northern boundary of the campus (Source: Google earth pro)

1.1 Land Cover and Land Use

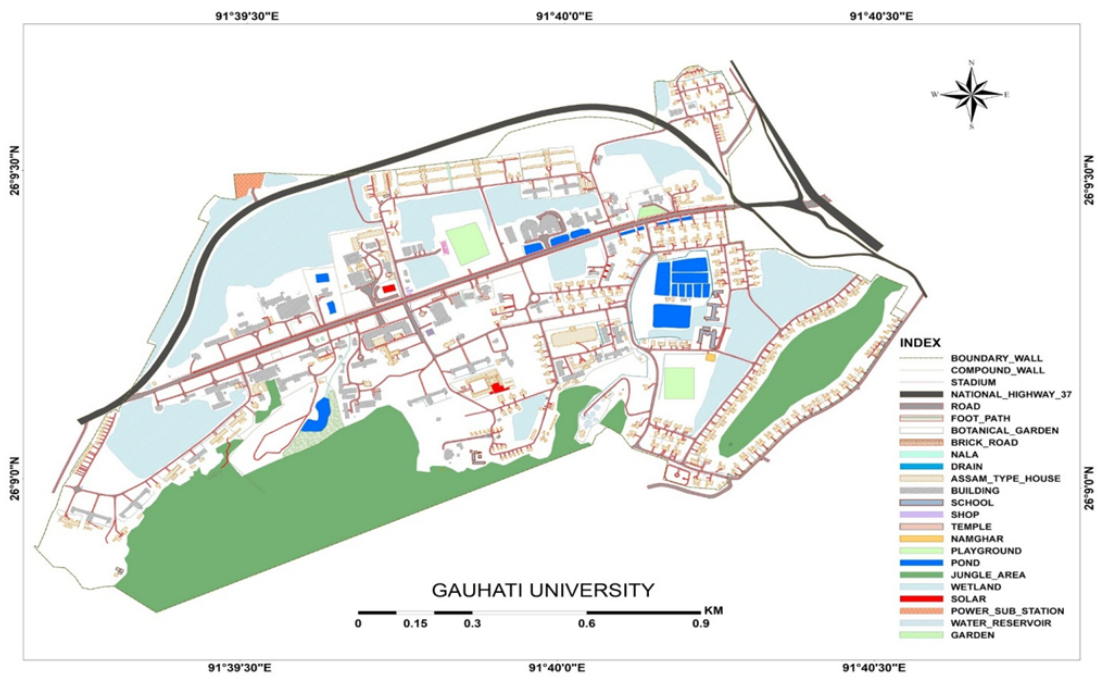
The landscape of Gauhati University is a composite mosaic of low lying hills, narrow uplands and a number of wetlands. Various academic departments and residential units/hostels have come up at the foothills or in filled wetland areas

while the hills are largely left as natural green cover. A survey conducted by Gauhati University in 2015 shows a total of 484 acres of land in the main campus of which 75 acres are under wetlands, 91 acres under natural forests and 2 acres under the botanical garden that together constitutes 168 acres ($\sim 34.7\%$; Figure 2). Four segments of natural forests cover the southern hills. Organized plantations in the campus are mainly along the internal roads and together with the homestead plantations around residential units, they add to the overall green cover. The green cover including natural forests, botanical garden and plantations, form $\sim 20\%$ of the total area. However, many of the wetlands have been silted up and presently they are under a thick cover of grass and aquatic plants which also contribute to the overall green landscape. As per the aforesaid survey of Gauhati University, there are a total of twenty wetlands of various sizes that are home to a wide diversity of aquatic flora and fauna. Efforts have been made in conserving these wetlands and towards these, some of the wetlands have been desilted and cleared off the top biomass cover.

1.2 Built up environment

Table 1 shows different types of built-up area. Since there has been some additional built-up post-2015 survey, the actual figure under the total built-up will be a little more than shown here. It is found that a total of about 78.4 acres (16.2% of total) are under the built-up category, of which Assam type residential units, hostels, and administrative units form a significant part. In absence of available high ground for further new constructions, many of the wetlands are being filled up thus shrinking the natural wetland cover in recent times. Since the wetlands are essential components of the campus landscape and biodiversity, it is of paramount importance to preserve this ecosystem. This can be achieved through optimal utilization of the areas under Assam type houses making way for more vertical expansions. Proper drainage need to be developed in the campus as a priority since over the years, particularly after construction of the bypass highway towards north, waterlogging has been in the rise.

In general, the campus presents a pristine environment with lush green cover dotted with many varieties of wild flowering plants (Figure 3A-C). A tranquil environment is an improvement in recent times due to control on the huge flow of outsiders and also due to diversion of vehicular traffic through the bypass towards north.



(a) Land use map of Gauhati University Campus (Based on survey conducted in 2015)



(b) A view of the new main entrance to Gauhati University (lighted up by the morning sun)

Figure 2



(a) Green cover of hills juxtaposed with wetlands



(b) A tranquil morning



(c) Golden shower in full bloom

Figure 3: Lush environment in the campus

Table 1: Built-up categories in Gauhati University Campus (Based on GU survey 2015)

Sl. No.	Land Use Category	Area (Acres)	Sl. No.	Land Use Category	Area (Acres)
1	GU Campus	483.713	31	Hut	1.31423
2	Botanical Garden	2.04694	32	Namghar	0.12246
3	Road	20.1664478	33	Water Pump	0.036395
4	Divider	0.617044	34	Playground	4.00509
5	Road Unmetalled	0.186615	35	Septic Tank	0.400901
6	Foot Path	5.885191	36	Pond	7.557342
7	Ring Well	0.00575	37	Jungle Area	91.002504
8	Sign Board	0.033346	38	Wet Land	75.299581
9	OFC	0.001035	39	Solar	0.373466
10	Oil Man Hole	0.000786	40	Tin Shed	0.051762
11	Rock	0.074877	41	Bathroom	0.006493
12	Biofuel Unit	0.050387	42	Power Sub Station	0.991229
13	Pump Station	0.00061	43	Water Reservoir	0.267077
14	Car Track	0.870524	44	Toilet	0.202206
15	Brick Road	0.013168	45	Foundation Stone	0.000212
16	Nala	0.360957	46	Building Under Construction	0.006203
17	Protection Wall	0.001013	47	Overhead Tank	0.035068
18	Drain	1.872992	48	Dust Bin	0.000603
19	Retaining Wall	0.053146	49	EP Box	0.003566
20	Bench	0.002516	50	Water Tank	0.270281
21	Culvert	0.212044	51	Car Parking	0.048694
22	ATM	0.00776	52	Garage	0.325104
23	Assam Type House	15.634168	53	Bus Stop	0.019502
24	Building	17.88869	54	Garden	0.539414
25	School	0.812026	55	Panel Board	0.001973
26	Transformer	0.053045	56	Electric Room	0.000595
27	Shop	0.217685	57	Sahid Bedi	0.013919
28	Generator	0.03877	58	Statue	0.008653
29	Security House	0.025495	59	Cycle Stand	0.022548
30	Temple	0.149728	60	Hut Area	0.620613
			61	NH 37	5.34328

2 An Insight into Gauhati University's Green Audit

In India, the Supreme Audit Institution (SAI) has been conducting environmental audits for the last 25 years. However, it was only since 2002, that the process of Green Auditing has been formalized by the SAI with the advent of specialized guidelines (MSO, 2002). The SAI Green Audits, under these new set of guidelines, can be divided into 5 broad categories:

- Air Issues
- Water Issues
- Waste
- Bio-diversity and

- Environment Management System

Along similar lines, the Green Audit for the Gauhati University campus is proposed to be carried out for 5 Parameters, namely (a) Bio-diversity Audit, (b) Waste Management Audit, (c) Water Management Audit, (d) Air Pollution Management Audit and (e) Energy and Electricity Audit. For the purpose of this audit (2018) primary data from the 5 stakeholders listed above was collected using questionnaire survey method. The questionnaires were prepared keeping in mind the objectives of this green audit exercise. Four sets of questionnaires were prepared, one each for Academic Departments, Hostels, Teacher's Quarters and one specially designed for the University Offices, Department of Geography and Department of Botany. Data on bio-diversity, waste generation, and management and energy was accessed from all the five stakeholders, while data on water-consumption and electricity consumption was accessed from the hostels, teacher's quarters and administrative offices of the University. Additional data on flora and bio-diversity were collected from the Department of Botany, Zoology and Geography.

2.1 Bio-diversity Audit

A sound bio-diversity enriches the ecosystem and increases the productivity of the eco-system by protecting and conserving the wide variety of flora and fauna species. Bio-diversity provide functioning ecosystems that supply oxygen, purify the air, clean water, allow pollination of plants, naturally control pests and treat wastewater. The United Nations General Assembly has declared 2021-2030 as "The UN Decade on Ecosystem Restoration" which aims at massive restoration of degraded and destroyed ecosystems as it is a proven measure to fight the climate change and enhance water supply and biodiversity. Degradation of land and marine ecosystems affects numerous services essential to food and agriculture, including supply of fresh water, protection against hazards and provision of habitat for species such as fish and pollinators (United Nations Environment Programme Report 2019).

Currently, about 20 per cent of the planet's vegetated surface shows declining trends in productivity with fertility losses linked to erosion, depletion and pollution in all parts of the world. By 2050, degradation and climate change could reduce crop yields by 10 per cent globally and by up to 50 per cent in certain regions (United Nations Environment Programme Report 2019). Gauhati University is committed towards finding sustainable solutions towards climate change and environmental degradation which calls for "aggressive restoration program that builds resilience, reduces vulnerability and increases the ability of systems to adapt to daily threats and extreme events"- an idea perfectly articulated by Lina Pohl, Minister of Environment and Natural Resources of El Salvador, a regional restoration leader during her speech at the UN General Assembly on 1st March 2019.

As a part of this effort, assessment is being made on the strength and soundness of the biodiversity within the campus with an enumeration of the number of plant species and plantation practices.



Figure 4: Joining hands in a plantation drive at GU (Photo courtesy: D. Borbora)

According to Simone Borelli, an Agroforestry and Urban/ Periurban Forestry Officer with the FAO of the United Nations, “Trees could reduce temperatures in cities up to 8 °C, lowering use of air conditioning and related emissions by up to 40 per cent”. Over the past one year, there have been several tree plantation drives (Figure 4) carried out by the University under teacher-student initiative within the campus as well as in colleges affiliated to Gauhati University as an effort to promote greenery which is a key way to mitigate climate change and boost land-based diversity. The Green Audit Committee of Gauhati University aims at promoting the idea of the UN Environment, which stresses upon planting indigenous trees supported by local communities. The Green Audit Committee however, cautions against unscientific planting of trees as species planted should be ones that are most effective at trapping pollution, typically those with large leaves. Authorities concerned with plantation also need to account for things like wind patterns and tree spacing. Being an educational institute with an increasingly diverse community, the Green Audit committee cautions against planting trees that increase pollen and allergies. A more detail account on the campus biodiversity, both floral and faunal, is presented in Sec. 7

2.2 Waste Management Audit

Solid-Waste Management Audit

Solid Waste audit covers the generation of solid waste, its collection and disposal. The audit focuses on the volume of wastes accumulated in the campus and assesses whether the way in which it is treated or disposed-off is environmentally sensitive. Studies by Allen et. al., (2015), find that composting solid waste is more sustainable than landfilling. Solid-waste sent to landfills undergoes anaerobic decomposition and produce landfill methane gas emissions, which is 72% stronger than CO₂. Composting, however, involves aerobic decomposition and produces CO₂, reduces methane gas emissions and also leads to carbon sequestration. Besides landfilling and composting, recycling is another way in which solid wastes are treated. It pertains to the recovery and reuse of plastic wastes, metal waste, etc. Recycling practice serves as a way to keep large amounts of solid waste out of landfills, conserve resources and save energy.

Hazardous Waste Management Audit

Hazardous waste is a label assigned to specific class of refuse which in some way is potentially dangerous to living beings and environment (White and Heckenberg, 2011). These include electronic waste such as cadmium, lead and PVC on cables, bleach, paints, zinc and titanium oxide in cosmetics, asbestos, chemical laboratory waste, etc. Chemical laboratories have the potential to generate a wide range of hazardous waste: aqueous waste (cyanide, chromium VI, sulfide); organic liquids (solvents, oils); and solids (glass, sharps, resins, alloys). Efficient management of hazardous waste involves an organized system of identification, storage upon generation or containerization, collection and transportation and final treatment to disposal which depends on the physical form of wastes. Disposal of hazardous wastes includes land disposals, incineration, dumping in the sea, deep well injection, etc. The Hazardous waste audit for the University identifies the sites where such wastes are generated, the volume of the waste generated and the treatment methods used for such wastes.

2.3 Solid-Waste Management

Status of Solid Waste Generation in the campus

As tabulated below, on an average, the hostels account for the highest amount of solid waste generated in the campus. However, this conclusion could be an overstatement given the fact that this report hasn't yet processed sufficient data from the administrative offices' section. Nonetheless, with most of the activities

in the University being concentrated in the hostels and academic departments, it is natural that these two sections contribute the most to the University's total solid-waste generation. On average, the academic departments, hostels and residential quarters generate 273.5 kg, 300 kg and 67.5 kg of solid waste per month respectively.

Table 2: Solid waste generated on the campus per month

Sl. No.	Stakeholders	Average solid waste Generated (kg/month)	Percentage share (Total)
1	Academic Departments	273.5	42.7 %
2	Administrative Offices	n/a	n/a
3	Hostels	300	46.8 %
4	Teachers Flats/ Residential Quarters	67.5	10.5 %
	Total	641.18	100

Management of Solid-wastes

On a positive note, Management of solid-waste is one area where every all stakeholders are more-or-less aware of the issues involved. Each of these sections/ stakeholders have appropriated their own set of solid-waste management practices as per their convenience, requirements and availability of resources. Investigation reveals that 19 Academic Departments of the University have a total of 185 numbers indoor dustbins installed for solid-waste disposals. In average terms, each of these departments has a provision of ~10 dustbins. The departments of Geology, Botany, HRDC and GENESIS further maintain bio-degradable and vermi-compost facilities. The teacher's quarters maintain on an average 2 personal dustbins for solid-wastes disposals. Depending on requirements, the strength of boarders and green practices, varying number of dustbins are installed in the hostels. Provisions range from as few as 3 dustbins in RCC III Boy's Hall to 20 dustbins in RCC V Boy's Hall.

The above statistics does not, however, address whether such practices are green or sustainable. Assessing this requires further considerations on the nature and subsequent treatment of such disposals and in doing so we find that:

- 42% of the Academic departments and 50% of residential quarters maintain separate disposal systems for dry and wetwaste.
- the culture of separating bio-degradable waste from non-biodegradable ones is prevalent in the teacher's quarters and in 42% of academic departments but is absent in hostels.
- For 52.6% of academic departments, the accumulated solid waste is lifted by GMC, for 26% of departments, it is landfilled while for the rest it is composted.
- For 75% of the teacher's quarters, the entire amount of non-biodegradable wastes accumulated is lifted by the GMC every alternate day in a week. For

the remaining 25% of quarters, only 80% of the waste is lifted by GMC, while the remaining is landfilled and composted.

- Similarly, only 50% of hostels have adopted landfilling and composting processes, while the remaining 50% allow the wastes to be lifted by GMC only.
- Daily cleaning is in practice for all the departments and special cleaning drives are initiated periodically by the students and faculty of these departments to imbibe and foster GO-GREEN culture on the campus.
- Solid-waste recycling is not practised in either of the sections, formally or informally.

A substantial amount of wastes-both plastic and biodegradable, are generated in the university market complex which witness a large number of footfalls everyday. However, the waste management in and around the market complex is dismal as can be seen from overflowing dustbins and open dumping of wastes in the adjacent wetland (Figure 5A,B). Continuing construction activities result in generation of concrete wastes (Figure 5C) which are often found left out even after completion of the work. As mandated, these are to be removed and disposed properly by the vendors/contractors which seems to be not strictly adhered to. This calls for urgent attention of the concerned estate department. However, in a recent initiative by the authority, dustbins for segregation of various wastes as recommended by the Green Audit Committee, have been installed in academic departments with laboratories (Figure 5D).

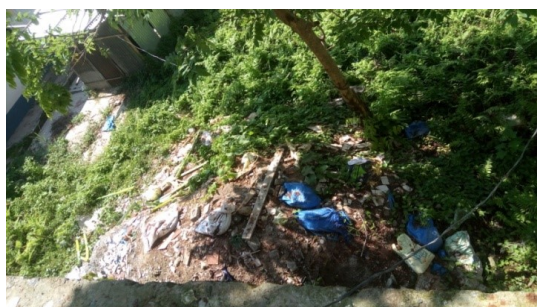
While the centralized system of solid-waste management involves timely and periodic lifting of the disposed of wastes by the Guwahati Municipal Corporation, it is laudable that proper waste management including composting initiatives have been adopted by various some hostels, departments and quarters. However, the need for a formal and centralized system for landfilling and composting ought to be adopted in the University. Moreover, the practice of recycling is another avenue that requires immediate operationalization.



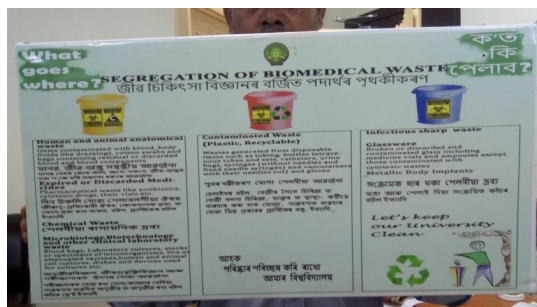
(a) Overflowing dustbins in university market complex



(b) Open dumping of waste in university market complex



(c) Concrete waste generated from construction activities



(d) Dustbins for segregation of different types of waste installed at academic departments

Figure 5: Views of poor waste management

2.4 Hazardous Waste Management

Laboratories have the potential to generate a wide range of hazardous waste: aqueous waste (cyanide, chromium VI, sulfide); organic liquids (solvents, oils); and solids (glass, sharps, resins, alloys). Efficient management of hazardous waste involves an organized system of identification, storage upon generation or containerization, collection and transportation and final treatment to disposal which depends on the physical form of wastes.

The Audits report that only 10.5% of total academic departments use hazardous substances in their laboratories and only 15.7% generate chemical wastes (Figure 6). The Departments of Chemistry and Instrumentation generate around 11 kgs of hazardous wastes every day. Unfortunately, these laboratories do not possess any efficient infrastructure for proper containerization, transportation, and treatment of these wastes.

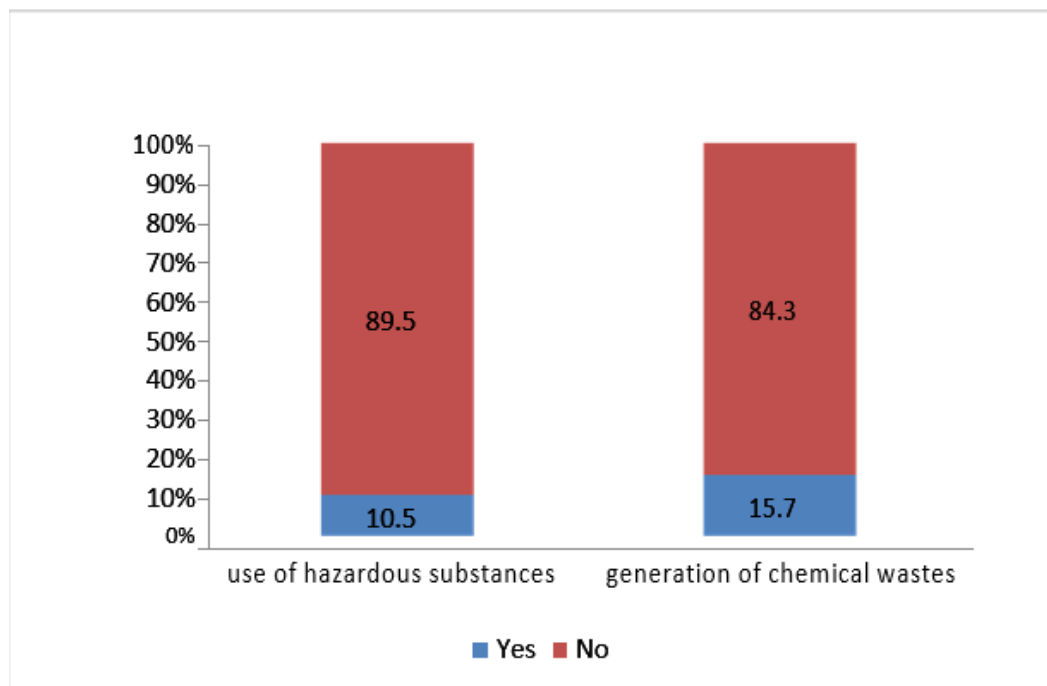


Figure 6: Generation of chemical and hazardous wastes in academic departments of the campus

3 Water Management Audit

This parameter audits consumption of water, various uses of water as well as leakages and overflow of water from tanks. Besides, it tries to explore whether waste-water is efficiently managed on the campus.

Drinking water quality within the campus (sample from seven distinct locations including Hostels, Academic quarters, and Administrative buildings) was found to be within permissible limit according to the Office of the State Public Health Laboratory, Government of Assam. As evident from the report of the drinking water analysis there is only a slight amount of turbidity in water supply to the Girl's Hostel.

3.1 Water-use and consumption

Approximately, 10,500 liters of water is pumped on a daily basis by an average hostel. On average, a residential quarter pumps 737.5 liters of water and uses 600 liters of water daily, implying that approximately 130 liters of water are either wasted or unused. 80% of water is used indoors in hostels, while the remaining 20% is used for outdoor purposes. On average, 70% of water is used indoors in quarters while the rest is used for outdoor purposes like gardening, car washing, etc. Back-up water facilities like hand-pumps or wells aren't available here and

water harvesting culture is also found to be absent in both the hostels and quarters.

3.2 Status of waste-water management

Primary sources of water-wastage in the campus are overflowing water tanks, leakages in pipes, and mud filled tanks. The survey finds that in 50% of the quarter's water overflows for less than 3 mins per day, while for the remaining it flows for more than 3 minutes as shown in Figure 7. Almost all the quarters also lose water due to leakages and plumbing discrepancies in their systems.

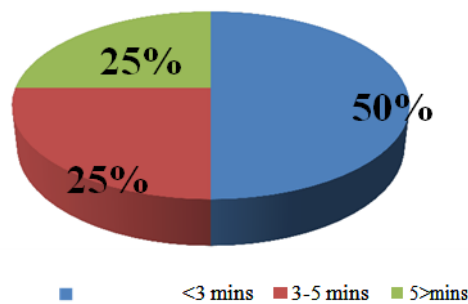


Figure 7: Wastage of water due to overflow (Min/day) from tanks in teacher's quarters

Overflowing water-tanks is not as severe a problem in the hostels though. Around 5% of water is wasted in hostels on an average on a daily basis, with faults in the plumbing system being the main source of such wastage. Neither the hostels nor the quarters, however, have any efficient provision for collecting and reusing wastewater. Presence of water-management committees in hostels and for quarters is the need of the hour.

As far as drainage-systems is concerned, an average residential quarter has at least one well-functioning drainage and sewage system. 75% of these quarters personally clean these drainage systems on a monthly basis, while the remaining 25% cleans it daily. The highest number of water-logging and drainage blockades that have been recorded is 4 times per month. Maintenance of drainage system varies across hostels as well. An average hostel has around 3 drainage and sewage systems. However, while some hostels clean them every alternative day, others clean it once a month. It is observed that the quality of water supplied to the Girl's Hostel needs to be improved following superior purification measures.

4 Air Pollution Management Audit

Air pollution is the theme of the World Environment Day on 5th June 2019. Air Pollution Audit for the university proceeds with an enumeration of all equipment and machines that impose a threat on indoor air quality. Printers and Photocopiers have been found to emit ozone, volatile organic compounds and ultrafine particles, thus degrading indoor air quality. Personal computers have been found to emit chemicals like phenol, toluene, formaldehyde and styrene. Air conditioners and heaters further have been found to cause emissions of sulfur dioxide, nitrogen oxide, carbon dioxide to increase by hundreds to thousands of metric tons, i.e, upto 3 percent per degree Celsius.

Further, the audit assesses whether the use of artificial pest controls is prevalent on the campus. Artificial pest controls and pesticides come with a specific set of environmental concerns, making them less air-friendly.

Monthly air quality data (Table 3) recorded by the Department of Environmental Science shows a higher concentration of green house gases namely, CO₂ and CH₄ with a data range of 404-430ppm and 2065-2315ppb respectively, against a global respective record (tropospheric concentration) of 399.5ppm and 1834ppb (Blasing, 2016). In absence of any past reference data and/or data from other independent sources, reliability of the presented dataset in this report could not be validated. However, it will be of importance to work out the cause and effect relationship on these atmospheric parameters and relate to the temperature profile in the campus. A continuous monitoring programme is, therefore, required to be taken up in the campus.

The university departments and administrative units deploy a large number of computers and peripherals, ACs besides photocopier machines and heaters. The risk to indoor air quality from such equipments, although yet to be assessed, is expected to be minimal due proper ventilation systems in the buildings and surrounding greenery. A popular green practice followed by the departments is the use of bicycles as an alternative to fuel driven vehicles. As of now, around 71 bicycles, the numbers of which are increasing with time, are in use by the university community. Furthermore, it was found that~32% of the departments promote the use of recycled papers and products besides most of the departments promoting paperless transactions.

As per the audit, a residential quarter on an average possesses 1 heater, 1 refrigerator, 1 air conditioner, 1 car, 1 bike and 1 bicycle. 25% of the quarters report the presence of still and stagnant water bodies in front of their quarters. Each of the quarters has their own personal mosquito-controlling means. However, there is an absence of centralized, authorised and green pest-control measures. An average hostel records possession of 12 bikes, 1 car and 10 cycles. While a centralized pest-control measure is absent in hostels too, RCC 5 Boys hall have undertaken 10 pest-control measures in the year 2018.

Table 3: Monthly air quality data for the year 2018

Station: Gauhati University (Dept. of Env. Sc.)**Source:** MAPAN Programme (DST, Govt. of India; coordinated by IITM, Pune)

Para-meters (Units)	Monthly Average Data for 2018											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CO (ppm)	0.86	0.72	0.70	0.59	0.43	0.44	0.57	0.43	0.44	0.44	0.42	0.43
O3 (ppb)	23.5	26.1	24.8	24.9	22.1	20.0	15.7	15.6	14.6	14.0	10.0	9.31
NO2 (ppb)	12.9	14.1	12.8	11.0	12.5	11.2	11.5	11.3	10.8	15.7	32.7	31.5
Nox (ppb)	26.9	27.2	24.6	21.1	17.6	16.5	17.2	16.9	16.5	25.9	57.7	53.9
Black Carbon (ppb)	6.9	5.2	4.9	3.8	2.7	2.3	2.6	2.2	3.1	5.4	4.9	0.89
PM2.5 (ppb)	103	94	75	47	24	19	13	13	23	41	65	95
PM10 (ppb)	133	151	123	71	43	31	24	21	32	69	76	130
CO2 (ppm)	410	413	430	427	423	415	414	404	412	416	414	417
CH4 (ppb)	2315	2228	2174	2123	2065	2126	2282	2260	2092	2124	2159	2210
TNMHC (ppb)	120	181	186	138	123	185	224	189	109	178	119	127
Air Temperature (oC)	18.8	21.0	24.0	25.5	26.4	28.8	29.3	29.8	28.5	26.0	22.6	19.20
R. H. (%)	84	81	81	82	85	85	86	85	86	85	85	85
Solar Radiation (W/m2)	100	103	135	151	137	155	158	160	144	135	115	95
Wind Speed (m/s)	1.3	1.4	1.9	8	1.6	1.6	1.6	1.7	1.6	1.3	1.0	1.4

5 Noise pollution management audit

The noise levels were recorded at various time of the day at 19 locations distributed within the campus. The instrument (Extech's Datalogging Sound Level Meter) was used for the measurement of noise level which complies with application standard IEC 651, Type 2; ANSI 1.4 Type 2, capable of measuring the sound level of range 30-130 dB and frequency range 31.5Hz-8kHz fitted with Electret condenser microphone. The instrument was calibrated before taking noise samplings and was set to record noise samples at 2-sec intervals during the 10 minutes exposure time.

The sampling locations (Table 4) were determined in such a way that there is uniform distribution and almost all the major locations are included. The sampling locations were recorded with the help of hand-held Global Positioning System (GPS) receiver.

The average noise data for the month of January is given in Table 5. The entire day was divided into 5 time zones starting from 6 am in the morning to 9 pm at night. The parameters used to evaluate and analysis of noise levels are equivalent sound pressure level (Leq), and Sound pressure level (SPL). The equivalent sound pressure level has been used most widely to measure the noise level which represents the continuous noise level that would have produced the same effects as the varying sound. The variations of noise levels in the present study were assessed from the statistical distribution of noise levels in the environment.

This study suggests that the equivalent noise level is maximum during the time interval in the midday 9am-12pm and registered minimum during the time interval morning at 6am-9am at the sampling (Figure 8). The average equivalent noise level was ranged between 36.7 dB – 66.5 dB during 6am-9am of the day,

Table 4: Sampling sites and Coordinates

Site No.	Site Name	GPS Coordinates
5.	G.U Exit Gate Seven Mile	26 9' 2" N; 91 39' 25" E
6.	G.U Main Gate	26 9' 16" N; 91 39' 43" E
7.	G.U. Gate Sundarbari	26 9' 2" N; 91 39' 55" E
8.	G.U. Entry Gate Jalukbari	26 9' 28" N; 91 40' 22" E
9.	SBI/GU Market	26 9' 18" N; 91 39' 47" E
10.	Prof. Qtr. No 3	26 9' 28" N; 91 40' 22" E
11.	VC's Residence	26 9' 1" N; 91 40' 11" E
12.	GU Staff Qtr Near Highway	26 9' 39" N; 91 40' 18" E
13.	AT-8 Boys' Hall	26 9' 21" N; 91 39' 26" E
14.	RCC-4 Girls' Hall	26 9' 29" N; 91 40' 00" E
15.	RCC-1 & 2 Boys' Hall	26 9' 11" N; 91 39' 47" E
16.	Gandhi Bhawan	26 9' 12" N; 91 40' 03" E
17.	AT-7 Boys' Hall	26 8' 57" N; 91 39' 17" E
18.	Zoology Department	26 9' 15" N; 91 39' 32" E
19.	K.K Handiqui Library	26 9' 15" N; 91 39' 33" E
20.	Administrative Block	26 9' 19" N; 91 39' 42" E
21.	G.U. Model School	26 9' 19" N; 91 40' 05" E
22.	RADAR Station	26 8' 2" N; 91 40' 32" E
23.	G.U. Hospital	26 9' 17" N; 91 39' 54" E

between 44.8 dB-63.2 dB during 9am-12pm, between 46.1 dB - 64.5 during 12pm-3pm, between 44.8 dB-63.7 dB during the hours 3pm-6pm and ranging between 43.9 dB-64.5 dB during the time interval 6pm-9pm respectively. The minimum equivalent noise level is reported at Gauhati University AT-8 Boys Hostel followed by GU Hospital. Similarly, the maximum equivalent noise level was registered at G.U. Exit Gate Seven mile, Gauhati University.

This data acquired was also compared to the standards of the Central Pollution Control Board, India (CPCB, 1998) for the prescribed area category as shown in Table 6. A statistical analysis of the noise level is given in Table 7.

Table 5: Average noise data for the month of January 2019

Sampling Location	SL NO.	6 A.M. - 9 A.M. (dB)	9 A.M. - 12 P.M. (dB)	12 P.M - 3 P.M (dB)	3 P.M. - 6 P.M (dB)	6 P.M. - 9 P.M. (dB)
G.U Exit Gate Seven Mile	1	66.3	63.2	63.6	61.23	59.4
G.U Main Gate	2	56.6	62.4	61	63.7	57.6
G.U. Gate Sundarbari	3	53.4	58.4	64.5	57.1	55.4
G.U. Entry Gate Jalukbari	4	62.9	62.6	63.1	63	61.8
SBI/GU Market	5	46.6	53.9	53.6	59.1	52.3
Prof. Qtr. No 3	6	50.7	56.2	52.6	52.6	52.2
VC's Residence	7	43.1	55.2	57.2	53.5	48.7
GU Staff Qtr Near Highway	8	66.5	63	55.7	63.6	64.5
AT-8 Boys' Hall	9	36.7	44.8	46.1	44.8	45.5
RCC-4 Girls' Hall	10	41.9	49.3	48.1	48.4	45.6
RCC-1 & 2 Boys' Hall	11	41.2	48.9	51	53.4	52.5
Gandhi Bhawan	12	45.6	52.6	53	46.3	43.9
AT-7 Boys' Hall	13	48.7	47.1	47.5	49.9	48.7
Zoology Department	14	45.9	52.1	49.8	52.8	49.8
K.K Handiqui Library	15	48.1	48.2	50.9	52.9	47
Administrative Block	16	47.1	48	49.7	49.5	45.7
G.U. Model School	17	43.9	55.6	51.3	49.1	43.9
RADAR Station	18	52.5	52.3	49.43	50	45.9
G.U. Hospital	19	45.9	51.1	49.5	51.9	49.2

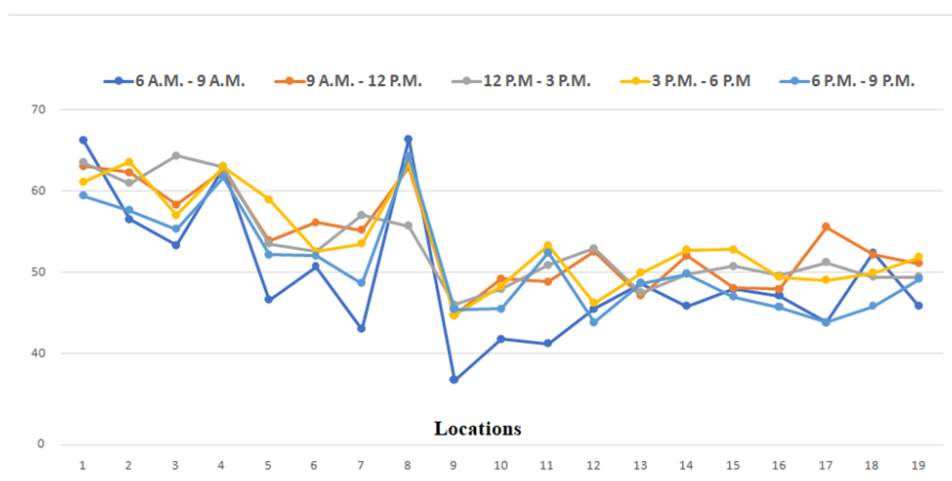


Figure 8: Noise level variation during different time of the day at the recorded stations

Table 6: Noise standards as given by the Central Pollution Control Board, India (CPCB, 1998)

Area Code	Category of Area/zone	Limits in dB (Leq)	
		Day time	Night time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silent Zone	50	40

The study reveals that all the sampling sites are affected by the traffic noise as these noise levels are higher compared to the standards of the Central Pollution Control Board, India (CPCB, 1998) for the prescribed area category as shown in Table 6. Being an educational institution Gauhati University falls under the 'silent zone' and the permissible noise limits for this category zone are maximum

Table 7: Characteristics of the Noise level of Gauhati University

Noise level in dB(A)	Time period dB	Mean dB	STDEV dB	Minimum dB	Maximum dB
Leq	6am-9am	49.6	8.3	36.7	66.5
	9am-12pm	53.9	5.7	44.8	63.2
	12am-3pm	53.5	5.7	46.1	64.5
	3pm-6pm	53.8	5.8	44.8	63.7
	6pm-9pm	51.0	6.1	43.9	64.5
SPL	6am-9am	47.5	7.3	38.1	64.3
	9am-12pm	47.2	8.4	34.5	64.5
	12pm-3pm	47.9	8.5	38.8	67.8
	3pm-6pm	48.6	7.7	34.7	66.1
	6pm-9pm	46.2	8.2	33.7	66.4

50 dB during day time (6am-9pm) and maximum 40 dB during night time(9pm-6am). But in the study, it is seen that the maximum was 66.5 dB during the day time and 67.8 dB during the night time which was much more than the CPCB Permissible limit.

A similar study carried out in the month of April, 2018 also showed a more than permissible limit of noise in the same nineteen recorded locations. These datasets further need to be validated through accredited labs. and in the event of similar results, remedial measures may be initiated subsequently.

6 Energy and Electricity Audit

Energy and electricity audit covers the aggregate consumption of power on the campus. It covers consumption of Natural Gas and fuels (petrol and diesel) in the hostels and quarters. It tries to decipher if renewable energy sources like solar energy facilities are available on the campus. Moreover, since LED lights are more environmentally sustainable than CFLs and Halogen lights, the audit evaluates the percentages of CFL, LED and Halogen lights used on the campus.

In the words of Energy Conservation Act, 2001, Energy Audit is “the verification, monitoring and analysis of the use of energy including submission of technical report containing recommendations for improving energy efficiency with cost-benefit analysis and an action plan to reduce energy consumption.”

In aggregate, the total power consumption in the campus grew by 10.6% in the financial year 2017-18, as shown in Figure 9, implying that on an average 288117 units of power has been consumed in a month by the university, as denoted in Figure 10.

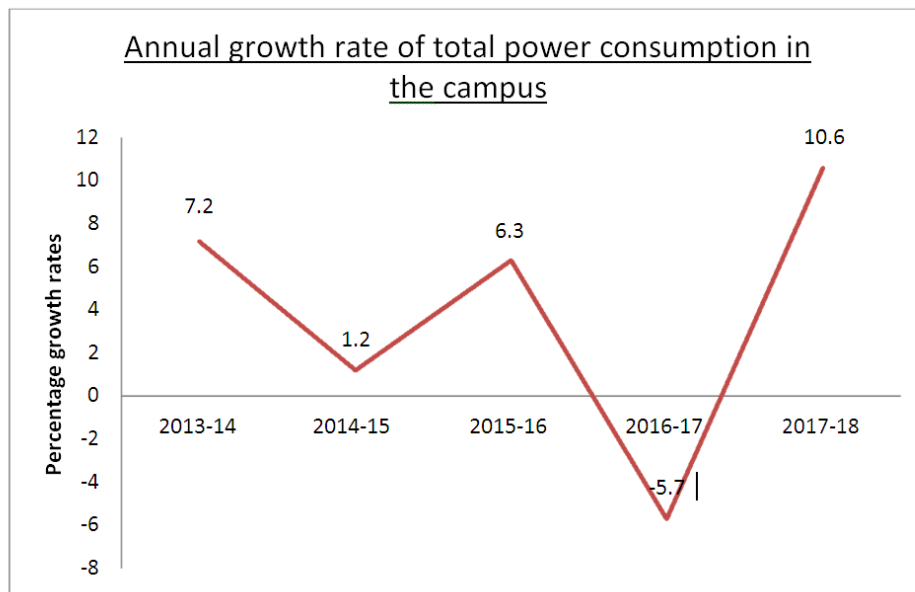


Figure 9: Aggregate power consumption growth since 2013-14 to 2017-18

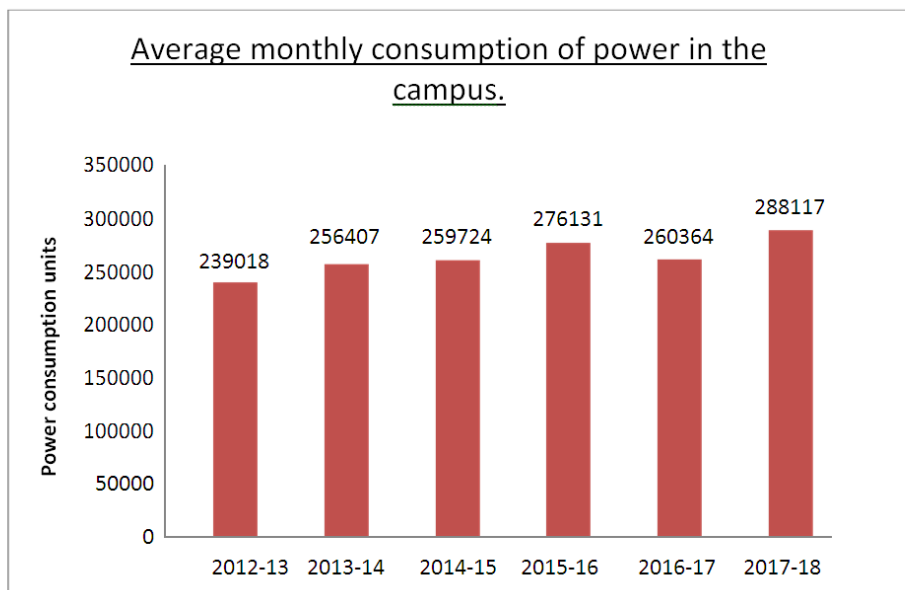


Figure 10: Average monthly consumption of power in the campus since 2012-13 to 2017-18

Considering the section-wise disaggregate audits, around Rs. 3250 worth of fuels (petrol and diesel), Rs. 687.5 worth of Natural Gas and Rs. 1625 worth of electricity is consumed by an average teacher's quarter in a month. An average hostel in the campus consumes Rs. 3500 worth of electricity and Rs. 8500 worth of Natural Gas. As far as alternative sources of energy is concerned, only 10.5% of the Academic departments have solar energy facilities while neither the hostels nor the residential quarters have access to solar energy facilities. Switching off lights and

fans when not in use is another green practice that needs to be followed by all the stakeholders. This will require both structural and non structural interventions.

The Audit further tries to assess whether the use of environmentally sustainable LED lights has taken over CFL lights. The survey finds that:

- On average, an Academic Department in the University has 18.4% of CFL lights, 61.3% of LED and 1.01% of Halogen lights
- An average quarter has 52.5% of CFL lights, 46.25% of LED lights and 1.25% of Halogen lights.
- For an average hostel, 80% of the lights are CFL, 16.5% are LED and 3.55 are Halogens.

This implies that while the use of LEDs is increasing, it is yet to fully replace the CFL bulbs. It is estimated by the electrical division of the University that power consumption has been reduced by nearly 50% after change over to CFL/LED lights. However, in recent times there is a spurt in installation of ACs due to which the consumption is actually showing an upswing. This necessitates a policy intervention to ensure that AC installation is done only with due approval of the electrical department after assessing the connected loads. Installation of meters in all the administrative units, academic departments and hostels must be completed on a priority basis. As informed by the University works department, about 49,973m underground cable laying is presently nearing completion covering more than 90% of residential areas and most of the academic departments (linked to transformer No. 2,5,11). This will increase the transmission efficiency and remove power outages due to storm events. Energy efficiency is surely increasing over the years but much more can be done with involvement of all the stakeholders.

Guwahati University has increased solar energy generation to 175KW with addition of new installations at the New Library building. Proposal for generation of additional 1MW of solar power through installations at the New Academic Building is in advance stage of implementation and with this addition a substantial amount of self reliance will be achieved through green energy.

7 Biological diversity

The natural landscape in GU campus including primary forests, hilly terrain, household gardens, Botanical Garden, Aquaculture and Biodiversity Parks, vegetated and open water wetlands and marshy lands etc. have provided a unique setting conducive for a wide variety of wild terrestrial and aquatic floral and faunal diversity including endangered species of mammals, birds, herpetofauna and

Arthropods etc. The vegetation in general can be classified as bamboo forest, woodland forest, hilly forest, marshy lands, cultivated forest and open water space etc.

The area supports varieties of migratory and residential water birds and IUCN threatened and endemic species of mammals and birds like Fulvous whistling teal, Greater Adjutant Storks, Lesser adjutant storks, Open bill Stork, Himalayan Griffon Vulture, Marsh babbler (endemic) Bengal Slow Loris, Common Leopards, Fishing Cat, various species of Civet Cat like small Indian Civet, Large Indian Civet cat, Common palm Civet, Spotted Linsang, Porcupine, Indian Jackel etc. Apart from various types of rodent species like Himalayan Hoary-bellied squirrel, field mouse, Bandicota rat, House shrew, moles etc. are found in the forests and residential complexes of the campus. The IUCN and WPA endangered species of Turtle and Tortoises and Burmese Python etc. also harbors within the University campus. It also supports breeding population of Indian Wildlife Protection Act (1972) endangered species like Large Whistling Teals, Peacock softshell turtle, Pond Turtle, etc. In fact the campus support as a protected sanctuaries of wild flora and fauna within Gauhati City.

Based on long term study of the faunal diversity through direct observation and indirect evidences like Camera Trappings, animal rescue operation of the faunal species encountered within the Gauhati University campus a comprehensive lists of mammals, birds, Amphibian fauna, Reptilian fauna, Butterfly fauna, other insect, Spiders, Arthropodan fauna etc. has been prepared by the Department of Zoology Gauhati University to highlight the importance of the area for the biodiversity point of view. Summary of the compilation on faunal diversity is given in different Tables. Representative photographs of various groups of flora and fauna are also are shown in Figure 11 and Figure 12.

Present conservation efforts for biodiversity include setting up of artificial bird nests and Bat house to and generation of reliable database on animal species covering all groups. Apart from that Department of Zoology, under the centre of Animal ecology and Wildlife Biology and Wildlife Science initiate the rescue of domestic and wild animal species since long time. Any such types of injured and rescued animal are treated scientifically with the aid of veterinary doctors (Part time services and as well as communicated with the Khanapara Veterinary College and Hospitals) and kept in the campus till released into the natural habitat of the University campus. In several occasions department of Zoology is initiated to rescue Snakes like Monoceal Cobra, Brumes Python and Turtles and released into the natural habitat of the campus.

Table 8 and Table 9 give a summary of overall faunal and floral diversity in the Gauhati University campus. Annex I gives exhaustive details of the documented species, both floral and faunal, so far recorded in the campus. The faunal record is largely drawn from the already reported list in the Green Audit Report 2017 with minor updates. The floral diversity is however, a new addition.

Table 8: Summary of faunal diversity in Gauhati University campus

Sl. No.	Type of fauna		Number of species	Remark
1	Mammal		22	Compilation by Prof. P. K. Saikia and Dr. Malabika Kakati Saikia, Department of Zoology, GU
2	Bird		149	
3	Amphibian		10	
4	Snakes		11	
5	Lizard		12	
6	Turtle		5	
7	Butterfly		147	
8	Odonate	Anisoptera (Dragonfly):28	48	
9		Zygoptera (Damsel/fly): 20		
10	Spider		40	
11	Coleoptera		21	
12	Crustacean species		3	All those are cultured and stage wise captive propagations are conducted. Most of them are indigenous ornamental fish Compilation by Prof. Dandadhar Sarma, Department of Zoology, GU
13	Naturally occurring Fish species		15	
14	Cultured Fish in Aquarium and Ponds		70	

Table 9: Summary of Floral diversity in Gauhati University campus, documented based on extensive field investigation

Sl. No.	Type of Flora	Number of species	Remark
1	Herbs	144	Compilation by Prof. P. K. Saikia and Dr. Malabika Kakati Saikia, Department of Zoology, GU
2	Shrubs	52	
3	Trees	117	
4	Grasses	40	
5	Bamboos	6	
6	Orchids	15	

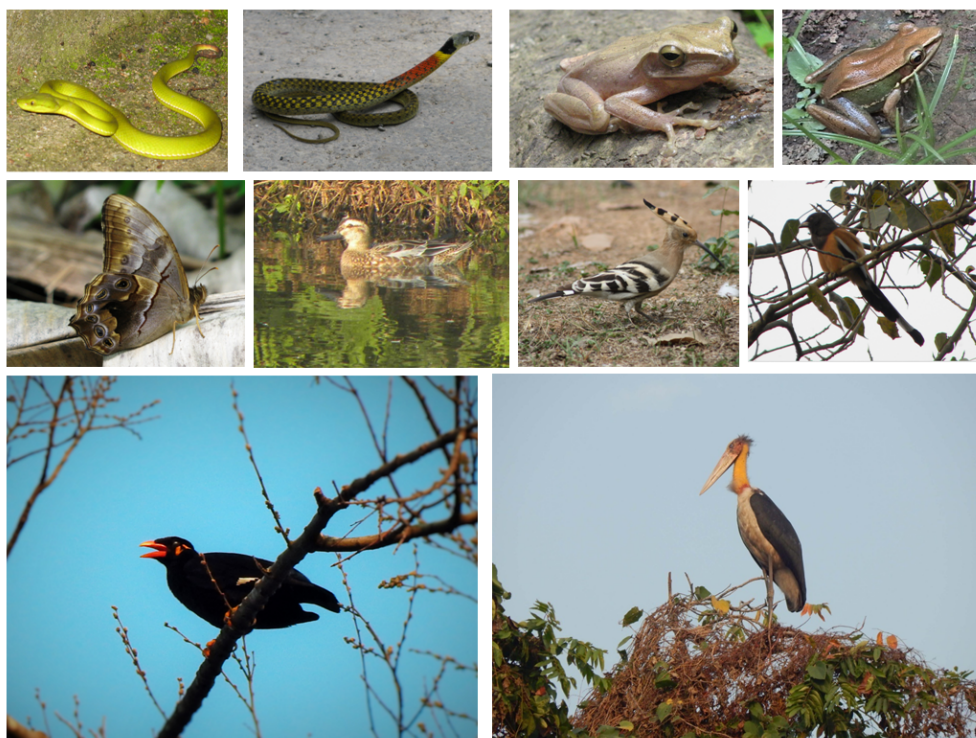


Figure 11: Representative species of snakes, amphibians, butterfly, migratory bird and the endangered Lesser Adjutant Stork (source: Green Audit Report, 2017, Gauhati University)

7.1 Floral Diversity in Gauhati University Campus

Survey carried out till date in the Gauhati University campus led to identification of as many as 196 herbs and shrubs and 117 Species of tree (Annex. I). Most of the shrubs and herbs are either medicinal plants or used as vegetables. It is however, observed that the campus community is not much aware of the importance of these medicinal plants, many of which are considered only as weed species and removed frequently during cleaning of the campus.

Proper conservation initiative is required for these species in the campus. More so because most of the medicinal plants arises from the herbs and shrubs and could be used as a potential research raw material for the evaluation of the remedial medicinal compounds of diseases like cancer. However, the present documentation of the herbs and shrubs are only less than 50% of the total numbers of species available within Gauhati University campus. So, further studies are also required to be done at the earliest.

Most of the tree species are growing naturally and few of them are either exotic or planted in different areas of the campus. However the present lists of tree species represented only less than 30-40 percent of plant species actually available in Gauhati University campus. Efforts are being made for proper documentation

of the species so that peoples in general and students in particular, can use them for taxonomic purpose. Various birds, Insects and other vertebrate species like Primates, Rodents, mammals, and other vertebrates and invertebrate species are dependent on those tree species for their survival. The tree species supports as a nesting, feeding, roosting and hiding covers of most of the animals species residing in the University campus. A sustaining tree cover with all its diversity in the campus will also support carbon storage and carbon sequestations for the mitigation of the local and global climate change.



(a) MASENDORI, Fam- Saururaceae, S.N.-
Houttuynia cordata



(b) DHEKIA, Fam- Onocleaceae, S.N.-
Matteuccia struthiopteris



(c) MALBHOG-kHUTURA, Fam- Portulacaceae, S.N.-
Portulaca oleracea



(d) POKMOU SAK, Fam- Solanaceae, S.N.-
Physalis philadelphica



(e) BORALIBOKUA, Fam- Urticaceae, S.N.-
Pouzolzia zeylanica



(f) BOR-TENGESI, Fam- Oxalidaceae, S.N.-
Oxalis corymbosa

Figure 12: Represented Photographs of Herbs, Shrubs and trees documented in Gauhati University Campus, Jalukbari, Assam(Majority of them have medicinal properties)

7.2 Status of wetlands in the campus

Gauhati University campus is endowed with a number of natural and manmade wetlands which support unique ecosystem besides adding an aesthetic appeal (Figure 8A). As a measure of restoration and to keep the wetlands free from eutrophication, the University authority has been carrying out desiltation and weed clearance in some of the wetlands (Figure 8B). This is a welcome move and should be continued till all the wetlands are restored.



(a) A patch of wetland covered with thick grass



(b) A patch of wetland after clearing the weeds (Photo at B. courtesy: D. Sahariah)

Figure 13: Wetlands in the campus

Table 10: Water quality at selected sites of wetland

Date / Time	Temp [°C]	pH [Units]	ORP [mV]	Dep25 [meters]	LDO% [Sat]	LDO [mg/l]
05-01-2019 09:51	17.99	5.67	252	1.64	17.9	1.41
10-06-2018 17:54	34.79	7.11	147	1.38	69.2	3.98

Date / Time	LDO_BP [mmHg]	Chlorophyll [$\mu\text{g/l}$]	Chlorophyll [Volts]	phycocyanin [cell/mL]	phycocyanin [Volts]
05-01-2019 09:51	635	0	0.0202	605	0.0048
10-06-2018 17:54	635	25.63	0.4965	6053	0.0178

To know the status of ecosystem health, water quality of the wetlands has been monitored for selected parameters with a sensor based OTT hydrolab DS 5 instrument on the selected sites (Table 10). The analysis shows marked improvement in ecological health in term of water quality.

8 Recommendations

The following recommendations are made for short and medium term implementation:

1. To put in place a comprehensive waste disposal system including e-waste, lab. chemical and biological lab wastes disposal. The defunct incinerator installed at the hospital campus should be made functional at the earliest
2. A comprehensive in-house documentation and analysis of air, water and noise in the campus with validation through engagement of an NABL accredited lab. need to be carried out as per standard protocol. Air quality monitoring need to be carried out on a continuous basis and can be taken up as a research programme. Water quality analysis for all the parameters should also include ground water from the wells/boreholes
3. A comprehensive survey and documentation of the floral and faunal diversity including aquatic organisms need to be carried out through in-house deployment of research scholars/students
4. Clearing and desiltation of wetlands together with development of a proper drainage system to make the campus free from a looming waterlogging problem. Since the wetlands are essential components of the campus landscape and biodiversity, it is of paramount importance to preserve them. Considering the need for further growth, optimal utilization of land can be ensured through vertical expansion wherever possible and also replacing old Assam type structures with multistoried ones in a phased manner.
5. Developing a campus Master Plan at the earliest to streamline growth and moving towards a Smart Campus regime.

6. Installation of electric and water meters in all the administrative units, academic departments and hostels on a priority basis.
7. Promoting cycling in a big way inside the campus with construction of cycle stands at designated locations in academic blocks.
8. Systematic plantation in designated areas identifying suitable indigenous species
9. Sensitizing stakeholders to avoid single use plastic and eventually transforming to a plastic free campus
10. Creating a 'Green Fund' with individual and institutional contributions including support under CSR
11. To propagate the concern and awareness about environmental issues and green practices, the University should centrally organize thematic events on World Environment Day, World Meteorological Day, World Water Day, World Wetland Day, World Habitat Day and Van Mahotsav etc,
12. Identifying and promoting diversity: Since diversity is a key component of 'green' norms and environmental sustainability, different aspects of diversity in G.U.'s way of life should be identified, analyzed, discussed and promoted via suggestions of sustainability measures. Thus, existing socio-cultural and linguistic diversity can be audited. Beginning with the student population, their ethnicity, places of origin and languages spoken can be collected through a suitable format such as an online questionnaire at the time of admission. Moreover, diversity in terms of existing socio-cultural groups and societies of students in G.U. can also be audited. Similar initiatives should be taken with regard to other aspects of diversity such as transportation, food habits, gardening practices (among residents).
13. Towards facilitating Impact Assessment: Any subsequent Green Audit Report should also necessarily incorporate the action taken report on recommendations of the Committee and present validated results on assessment of impact of the measures taken by the university authority. There need to be a change detection analysis on various green audit parameters over the years.

References

- [1] D. Adams. *The Hitchhiker's Guide to the Galaxy*. San Val, 1995. URL: <http://books.google.com/books?id=W-xMPgAACAAJ>.

I Floral diversity details, Gauhati University Campus

A: Diversity of Herb species in

Table 11: Diversity of Herb species in

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
1	Apiaceae	<i>Daucus carota</i>	Carrot	Gajor	Herb
2		<i>Coriandrum sativum</i>	Coriander	Dhonia	Herb
3		<i>Ferula as-safoetida</i>	Asafoetida	Hing	Herb
4	Asteraceae	<i>Xanthium strumarium</i>	Common Cocklebur	Agara	Herb
5		<i>Gnaphalium pensylvanicum</i>	Cudweed		Herb
6		<i>Gnaphalium polycaulon</i>	Many-Stemmed Cudweed	Kopahi gutiya	Herb
7		<i>Ageratum conyzoides</i>	Whiteweed, goatweed.	Gendhelibon	Herb
8		<i>Ageratum houstonianum</i>	Blueweed		Herb
9		<i>Spilanthes paniculata</i>	Phakphet	Huhoni	Herb
10		<i>Enhydra fluctuans</i>	Buffalo Spinash	Helosi	Herb
11		<i>Chrysanthemum coronarium</i>	Crown daisy	Indramalati	Herb
12		<i>Eclipta alba</i>	Falsedaisy	Keheraj	Herb
13		<i>Wedellia calendulacea</i>	Wedelia	Bhimraj	Herb
14		<i>Mikania micrantha</i>	Bitter vine	Amar lota	Herb
15	Aristolochiaceae	<i>Aristolochia indica</i>	The Indian Birthwort	Eswara mool	Herb
16	Araceae	<i>Amorphophallus bulbifera</i>	Devil's tongue	Ulkosu	Herb
17		<i>Alocasia ascuminata</i>	Elephant ears	Kosu	Herb
18		<i>Lasia spinosa</i>	Spiny arum	Kayetiya kochu	Herb

Table 11: Diversity of Herb species in

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
19		Homalomena aromatic	Schott	Gandh-kochu	Herb
20		Alocasia odora	Giant upright elephant ear		Herb
21		Alocasia cucullata	Chinese ape		Herb
22		Alocasia fornicata		Bish kochu	Herb
23		Alocasia indica	Giant taro		Herb
24		Thphonium trilobatum	Bengal arum		Herb
25		Araceae	Acorus calamus	Sweet flag	Bos
26	Amorphophallus paeoniifolius		Elephant foot yam	Wool kosu	Herb
27	Colocasia esculenta		Taro plant	Kola kosu	Herb
28	Pistia stratiotes		Shell flower	Borpuni	Herb
29	Amorphophallus paeoniifolius		Elephant foot yam	Ol-kochu	Herb
30	Apocinaceae	Rauvolfia serpentine	Indian snake-root	Aarason tita	Herb
31	Acanthaceae	Andrographis paniculata	King of bitter	Kolpotita	Herb
32	Amaranthaceae	Amaranthus spinosus	Spiny pig-weed	Katakhtutura	Herb
33		Alternanthera sessilis	Ponnanganni , dwarf copperleaf.	Mati kanduri	Herb
34		Deeringia amaranthoides	Shrubby deeringia	Rangoli lata / methokthuka	Herb
35		Amaranthus hybridus	Smooth pig-weed	Morisahak	Herb
36	Athyriaceae	Diplazium esculentum	Fern	Dhekia Hak	Herb
37	Araliaceae	Hydrocotyle sibthorpioides	Lawn marsh-pennywort	Horu manimuni	Herb
38	Alliaceae	Allium cepa	Onion	Piyas	Herb
39		Alliumsativum	Garlic	Nohoru	Herb
40	Amaryllidaceae	Crinum asiaticum	Spider lily	Bon nohoru	Herb

Table 11: Diversity of Herb species in

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
41		Polianthes tuberosa	Tuberose	Rajanigandha	Herb
42	Alismaceae	Sagittaria sagittifolia	Arrowhead	Jati potiya	Herb
43	Bromeliaceae	Ananas comosus	Pine apple	Anarosh	Herb
44	Byttneriaceae	Byttneria grandifolia	Nasturtium tree	Tekonibora	Herb
45	Boraginaceae	Heliotropium indicum	Indian heliotrope	Hatighur	Herb
46	Basellaceae	Basella alba	Malabar spinach	Puroihak	Herb
47	Convolvulaceae	Ipomoea carnea	Bush morning glory	Ajati kolmou	Herb
48		Evolvulus nummularius	Roundleaf bindweed	Oloha bon	Herb
49		Merremia umbellata	Yellow wood rose	Kolia lata	Herb
50		Ipomoea aquatica	Swamp cabbage, water bind weed.	Kolmou hak	Herb
51		Cuscuta reflexa	Amar Bel		Herb
52	Combretaceae	Quisqualis indica	Chinese honeysuckle	Madhbilata	Herb
53	Commelinaceae	Commelina diffusa	Climbing dayflower or spreading dayflower	Kona himolu	Herb
54		Commelina benghalensis	Benghal dayflower	Konahimolu	Herb
55	Cyperaceae	Kyllinga albescens	Goose tongue sedge		Herb
56		Cyperus brevifolius	Greater kyllinga		Herb
57		Scirpus articulatus	Apurau	Sesubon	Herb
58		Cyperus rotundus		Kensabon	Herb
59		Citrullus colocynthis	Bitter cucumber		Herb
60		Mukia scabrella			Herb

Cucurbitaceae

Table 11: Diversity of Herb species in

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
61		Trichosanthes palmata	Chinese cucumber		Herb
62		Lagenaria siceraria	Bottle gourd.		Herb
63		Luffa acutangula	Ridged gourd.		Herb
64		Momordica charantia	Bitter melon, bitter gourd	Tetakerela	Herb
65		Sechium edule	Mirliton squash	Squash	Herb
66		Cucurbita moschata	Pumpkin	Rongalaow	Herb
67		Cucurbita maxima	Red pumpkin	Mithalaow	Herb
68		Cucurbita pepo	Summer squash	Kumura	Herb
69	Cannabaceae	Cucurbita pepo	Summer squash	Kumura	Herb
70		Dioscorea batatas	Chinese potato	Gosalu	Herb
71	Disoscoreaceae	Dioscorea esculenta	Asiatic yam	Muwa alu	Herb
72		Dioscorea alata	White yam	Kathalu	Herb
73		Dioscorea pentaphylla	Fiveleaf yam	Paspotiyaalu	Herb
74	Euphorbiaceae	Euphorbia hirta	Asthma weed, cats ear, common spurge		Herb
75		Mucuna pruriens	Velvet bean	Bandor-kekuwa	Herb
76	Fabaceae	Flemingia strobilifera	Luck plant or wild hope	Makhiyoti	Herb
77		Clitoria ternatea	Butterfly creeper	Aparajita	Herb
78	Gentianaceae	Swertia chirayita	Warm wood, Bitter wood.		Herb
79	Heliotropaceae	Heliotropium indicum	Indian heliotrope, Indian turnsole	Hatihuriyan	Herb

Table 11: Diversity of Herb species in

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
80	Hydrocharitaceae	Hydrilla verticillata	Waterhyme	Haidrilla	Herb
81	Lamiaceae	Leucas plukenetii	Common leucas	Durun khak	Herb
82	Asphodelaceae	Aloe barbadensis	Indian aloe	Salkuwor	Herb
83	Asparagaceae	Asparagus racemosus	Shatavari	Hotmul	Herb
84	Colchicaceae	Gloriosa superba	Flame lily	Aagnihikha	Herb
85	Meliaceae	Cerdrela febrifuga			Herb
86	Mimosaceae	Mimosa pudica	Touch me not plant	Adoribon	Herb
87	Musaceae	Musa sp.	Banana	Kol	Herb
88		Musa bulbisiana	Banana	Kothiya kol	Herb
89		Musa paradisiaca	Zingiberales	Kas kol	Herb
90		Musa champa	Sugar Banana	Chenichompa kol	Herb
91		Musa chinensis	Edible Banana	Jahaji kol	Herb
92		Musa gigantea	Giant banana	Bhim kol	Herb
93		Musa sapientum	Banana	Monuhor kol	Herb
94		Musa assamica		Malbhog kol	Herb
95	Menispermaceae	Stephania japonica	Snake vine	Tubukilata	Herb
96		Stephania japonica	Snake vine	Tubukilata	Herb
97	Marantaceae	Phrynium pubinerve	Blume	Koupat	Herb
98	Nepenthaceae	Nepenthes khasiana	Pitcher plant, Demmon flower.	Kolochi udbhid	Herb
99	Nyctaginaceae	Mirabilis jalapa	4 o' clock plant.		Herb
100		Boerhavia diffusa	Punarnava	Purnonoba(Rongha)	Herb
101		Boerhavia repens	Alena	Purnonoba(Boga)	Herb
102	Papilionaceae	Clitoria ternatea	Butterfly creeper	Aparajita	Herb

Table 11: Diversity of Herb species in

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
103		Aeschynomene indica			Herb
104		Glycine max			Herb
105		Mucuna pruriens	Velvet bean	Bandorkekuwa	Herb
106		Paperomia pelucida	Spiny bush	Ponownowba	Herb
107	Pontederiaceae	Monochoria hastata	Arrow leaf pondweed		Herb
108		Eichhornia crassipes	Water hyacinth	Meteka	Herb
109	Passifloraceae	Passiflora adenophylla	Purple passion flower	Junuka lata	Herb
110	Pedaliaceae	Sesamum orientale	Sesam, Zinger oil plant.	Teel	Herb
111	Polygonaceae	Rumax maritimus	Golden dock	Bon-suka hak	Herb
112		Fagopyrum esculentum	Buckwheat	Dhensi hak	Herb
113		Polygonum hydropiper	Water-pepper	Bihalagani	Herb
114		Polygonum microcephalum	Knotweed	Madhuhuleng	Herb
115	Rosaceae	Potentilla supina	Bushy cinquefoil		Herb
116		Duchesnea indica	Mock strawberry		Herb
117	Rubiaceae	Mussaenda roxburghii	East Himalayan Mussaenda	Hukloti	Herb
118		Paederia foetida	Chinese fever vine or skunkvine.	Bhedailata	Herb
119		Hedyotis corymbosa	Parpat	Bonjaluk	Herb
120	Solanaceae	Withania somnifera	Winter cherry	Ashwagandha	Herb
121		Lycopersicon esculentum		Kon belahi	Herb
122		Physalis minima	Native gooseberry	Pokmou	Herb

Table 11: Diversity of Herb species in

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
123		<i>Solanum hirsutum</i>	Big Brinjal	Bor Bengena	Herb
124	Sapindaceae	<i>Datura stramonium</i>	Thorn apple	Dhotura	Herb
125	Smilacaceae	<i>Smilax macrophylla</i>	Kumarika		Herb
126	Scrophulariaceae	<i>Bacopa monnieri</i>	Waterhyssop	Brahmihak	Herb
127	Urticaceae	<i>Pouzolzia zeylanica</i>	Graceful pouzolz's bush	Borali bokua	Herb
128		<i>Laportea interrupta</i>	Hen's nettle	Dam-surat	Herb
129		<i>Sarcochlamys pulcherrima</i>	Dogal tree	Mesaki	Herb
130	Zingiberaceae	<i>Zingiber officinale</i>	Ginger	Ada	Herb
131		<i>Curcuma amada</i>	Mango ginger	Aam-ada	Herb
132		<i>Kaempferia galanga</i>	Aromatic ginger	Chandramula	Herb
133		<i>Amomum subulatum</i>	Black cardamon	Dangor Elachi	Herb
134		<i>Curcuma domestica</i>	Tarmeric	Halodhi	Herb
135		<i>Alpinia nigra</i>	Black galangal	Tora	Herb
136	Vitaceae	<i>Cissus quadrangularis</i>	Veldt grape	Harjora lata	Herb
137	Arecaceae	<i>Calamus flagellum</i>	Palmyra palm	Raidang bet	Herb
138		<i>Calamus floribundus</i>		Lesai bet	Herb
139		<i>Calamus leptospadix</i>		Lesai bet	Herb
140		<i>Calamus masteterianus</i>		Jali bet	Herb
141		<i>Calamus nambetriensis</i>		Huka bet	Herb
142	Lemnaceae	<i>Lemna perpusila</i>	Duck weed	Horu puni	Herb
143	Costaceae	<i>Costus speciosus</i>	Crepe ginger	Jom lakhuti	Herb

Table 11: Diversity of Herb species in

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
144	Portulacaceae	Portulaca oleracea	Common Purslane	Malbhug Khutora	Herbs/ Medicinal and vegetable

B: Diversity of Shrub species

Table 12: Diversity of Shrub species

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type	
1	Asteraceae	Chromolaena odorata	Siam weed	Jamanibon	Shrub	
2		Mikania micrantha	Climbing hempweed, Chinese creeper		Shrub	
3	Asclepiadaceae	Calotropis gigantea	Crown flower	Akon	Shrub	
4	Apocynaceae	Carissa congesta	Indian currant, Carunda, Christsthorn	Korojatenga	Shrub	
5		Cascabala thevetia	Yellow oleander	Korobi Phul	Shrub	
6		Holarrhena antidysenterica	Connessi bark, Tellicherry bark	Dhulkari, dudkhori	Shrub	
7		Calotropis gigantea	Giant milkweed	Aakon	Shrub	
8		Nerium indicum	Oleander	Rokto korobi	Shrub	
9		Thevetia neriifolia	Yellow oleander	Boga Korobi	Shrub	
10		Wrightia arborea	Woolly dyeing rosebay	Horu dudkhori	Shrub	
11		Tabernaemontana divaricata	Crape jasmine, Pinwheelflower	Jasmin Phul	Shrubs	
12		Acanthaceae	Phlogacanthus thyriformis	Nongmangkha	Titaaphul	Shrub

Table 12: Diversity of Shrub species

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
13		Phlogacanthus curviflorus	Wild nong-mangkha	Titaaphul	Shrub
14		Eclobium lineanum	Bluefox tail	Nilkontho tita	Shrub
15	Convolvulaceae	Ipomoea quamoclit	Star glory	Kunjolota	Shrub
16	Caricaceae	Carica papaya	Papaya	Omita	Shrub
17	Caesalpiniaceae	Caesalpinia pulcherrima	Peacock flower		Shrub
18		Cassia alata	Ringworm shrub, Candle bush, Christmas candles.		Shrub
19	Euphorbiaceae	Ricinus communis	Castor	Era	Shrub
20	Fabaceae	Caesalpinia bonduc	Grey nicker, Nicker bean.	Letaguti-goch.	Shrub
21	Lamiaceae	Ocimum tenuiflorum	The sacred basil	Tulshi	Shrub
22		Callicarpa arborea	Beautyberry tree	Gunmola	Shrub
23	Loranthaceae	Dendrophthoe falcata	Honey suckle	Roghumola	Shrub
24	Malvaceae	Hibiscus rosasinensis	China-rose		Shrub
25		Hibiscus mutabilis	Confederate rose	Stalpodmo	Shrub
26	Marantaceae	Schumannianthus dichotomus	Cool mat	Patidoi gos	Shrub
27	Oleaceae	Jasminum multiflorum	Jasmine		Shrub
28		Nyctanthus arbortristis	Night flowing Jasmine	Hewali	Shrub
29		Jasminum auriculatum	Juhi	Khorikajai	Shrub
					Shrub
30		Jasminum malabaricum	Wild jasmine	Khorikajai	Shrub
31	Papilionaceae	Cajanus cajan	Pigeon pea	Orohor	Shrub

Table 12: Diversity of Shrub species

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
32	Papilionaceae	Abrus precatorius		Kauri moni	Shrub
33	Papilionaceae	Crotalaria juncea			Shrub
34		Crotalaria pallida			Shrub
35	Piperaceae	Piper thomsonii	Awsipan	Auoni-pan	Shrub
35		Piper nigrum	Black pepper	Jaluk	Shrub
36		Piper longum	Long pepper	Pipoli	Shrub
37	Rosaceae	Rosa indica	Rose	Konth-gulap	Shrub
38	Rosaceae	Rubus alceifolius	Blackberries		Shrub
39	Rubiaceae	Coffea fragrans	Coffea	Kothona	Shrub
40		Coffea arabica	Coffee plant	Coffee gosh	Shrub
41		Coffea benghalensis	Bengal coffea		Shrub
42		Gardenia angusta		Togor	Shrub
43		Chasalia ophioxyloides	Curved flower snake	Teta Hukuta	Shrub
44	Rutaceae	Citrus aurantifolia	Lemon, lime	Kajinemu	Shrub
45	Solanaceae	Solanum ferox		Kotahi bengana	Shrub
46		Capsicum annum	Chilli	Jolokia	Shrub
47		Datura metal	Devil's trumpet	Dhotura	Shrub
48		Solanum torvum	Turkey berry	Hati bhekuri	Shrub
49		Solanum viarum	Soda apple	Bhekuri tita	Shrub
50	Verbenaceae	Lantana camara	Lantana weed	Gu-phul, Gubon	Shrub
51		Clerodendrum viscosum	Glory tree	Dhopat fool	Shrub
52		Lippia javanica	Fever tea, lemon bush.	Pishas bon.	Shrub

C: Diversity of Tree species

Table 13: Diversity of Tree species

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
1	Apocynaceae	Alsotonia scholaris	Devil's tree	Sotiyana	Tree
2		Plumeria rubra	Red jasmine	Gulonsh	Tree
3	Oxalidaceae	Averrhoa carambola	The star fruit	Kordoi	Tree
4	Amaranthaceae	Achyranthus spathulate-versicolor	Chaff flower	Brindabon	Tree
5	Anacardiaceae	Anacardium occidentale	Cashew nut		Tree
6		Magnifera indica	Mango	Aam	Tree
7		Spondias pinnata	Hog plum	Amora	Tree
8		Lanea coromondelica	Indian ash tree	Jia	Tree
9	Arecaceae	Phoenix dactylifera	Date palm		Tree
10		Livistona jenkinsiana	Asaam fan palm	Tokou	Tree
11		Areca cathecu	Betelnut plant	Tamul	Tree
12		Chrysalidocarpus lutescens	Areca palm	Mumai Tamul	Tree
13		Cocos nucifera	Coconut tree	Narikol	Tree
14		Phoenix sylvestris	Wild date palm	Bonoriya Khejur	Tree
15	Annonaceae	Polyalthia longifolia	Debdaru Tree	Debdaru	Tree
16		Annona muricata	Custard apple	Atlos	Tree
17	Berringtoniaceae	Barringtonia acutangula	Freshwater mangrove, Indian oak	Hendol, Hinyol, Pani amra	Tree
18	Calophyllaceae	Mesua ferrea	Nahar		Tree
19	Combretaceae	Terminalia cuneata	Arjun	Arjun goch	Tree
20		Terminalia catappa	Indian almond tree		Tree
21		Terminalia belirica	Bedda nuts	Bhumura	Tree

Table 13: Diversity of Tree species

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
22	Caesalpiniaceae	Saraca asoca	Sorrow-less tree	Ashoka tree	Tree
23		Delonix regia	Gold Mohur tree		Tree
24		Cassia fistula	Golden rain tree	Hunaru	Tree
25		Tamarindus indica	Tamarind tree	Teteli	Tree
26	Clusiaceae	Garcinia morella	Indian gamboge, Mysore gamboge, Sri Lanka gamboge	Kuji thekera	Tree
27		Mesua assamica		Sia-nahor	Tree
28		Garcinia xanthochymus	False mangosteen, egg tree	Tepor tenga	Tree
29	Cycadaceae	Cycas pectinata	Assam cycas	Nagphal	Tree
30	Celastraceae	Celastrus hindsii	Staff vine	Bhul loti	Tree
31	Dilleniaceae	Dilenia indica	Elephant apple	Ou-tenga	Tree
32	Euphorbiaceae	Phyllanthus emblica	Emblic myrabalan	Aamlokhi	Tree
33		Bischofia javanica	West Indian ceder		Tree
34		Sapium eugeniæfolium		Kohra	Tree
35		Excoecaria oppositifolia		Dudgos	Tree
36		Antidesma ghae-sembilla	Black currant tree	Heloch	Tree
37	Elaeocarpaceae	Sloanea sterculi-acea			Tree
38		Elaeocarpus floribundus	Indian olive		Tree
39	Fabaceae	Samanea saman	Flowering plant		Tree
40		Delonix regia	Gulmohar		Tree
41		Bauhinia purpurea	Butterfly tree, purple bauhinia.		Tree
42		Erythrina indica	Indian coral tree	Modar	Tree

Table 13: Diversity of Tree species

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
43		Acacia catechu	Black Catechu.	Khoeer	Tree
44		Albizia odoratissima	Black siris, Ceylon rose-wood	Koroi	Tree
45	Hernandiaceae	Illigera khasiana		Kerkeri lota	Tree
46	Lamiaceae	Tectona grandis	Teak	Shegun	Tree
47	Lythraceae	Lagerstroemia reginae	Ajar Tree		Tree
48		Lagerstroemia parviflora	Small flowered crape myrtle	Sida, Dhauli	Tree
49		Lawsonia inermis	Indian Privet, Henna Plant.	Jetuka	Tree
50	Lauraceae	Persea bombycina			Tree
51		Cinnamomum tamala	Bay leaf	Tejpat	Tree
52		Litsea glutinosa	Soft bollygum	Heluk	Tree
53		Litsea laeta		Bon huwalu	Tree
54		Litsea salicifolia		Digloti	Tree
55		Persea goalparensis		Bonsum	Tree
56		Cinamomum cecidaphne	Cinnamon	Gonsoroi	Tree
57		Cinamomum zeylanicum	Cinnamon	Dalseni	Tree
58	Lecythidaceae	Barringtonia acutangula	Mango-pine, freshwater mangrove	Pani-hejol	Tree
59	Moraceae	Ficus religiosa	Pipul Tree	Ahot	Tree
60		Ficus benghalensis	Banyan		Tree
61		Ficus auriculata	Monkey fruit/Dewa	Atha demoru	Tree
62		Ficus elastica	The Assam rubber tree	Athabor	Tree
63		Ficus hispida	Hairy fig, devil fig, opposite-leaved fig-tree	Domboru	Tree

Table 13: Diversity of Tree species

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
64		Ficus benjamina	Golden fig, Chinese banyan		Tree
65		Ficus rumphii	Mock peepul tree, mock bodh tree	Pakhri-bor	Tree
66		Ficus tinctoria	Dye fig, humped fig		Tree
67		Ficus lepidosa		Dimoru	Tree
68		Ficus heterophylla		Loti-dimoru	Tree
69		Artocarpus heterophyllus	Jack fruit	Kothal	Tree
70		Artocarpus lacucha	Monkey jack	Bohot	Tree
71		Artocarpus chama	Chapalish	Cham kathal	Tree
72		Streblus asper	Khoi, tooth-brush tree	Houra	Tree
73		Ficus fruticosa	Red Dra-caena	Lota Dimoru	Tree
74		Artocarpus gomeziana		Khorikadeba	Tree
75		Morus australis	Mulberry	Nooni gos	Tree
76	Myrtaceae	Syzygium cumini	Jamun	Kolajamun	Tree
77		Syzygium fruticosum	Black plum or jamun	Jamun	Tree
78	Meliaceae	Azadirachta indica	Neem	Moha neem	Tree
79		Melia azedarach	Persian lilac	Ghura neem	Tree
80		Magnolia champaca	Champak		Tree
81	Magnoliaceae	Magnolia griffithii			Tree
82		Magnolia pterocarpa	Wild magnolia	Borhomthurisopa	Tree
83		Michelia champaca	Joy perfume tree	Teta sopa	Tree
84		Michelia nilagiriica	Nilgiri champaka, white champak		Tree

Table 13: Diversity of Tree species

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
85	Myrsinaceae	Maesa indica	Sesu		Tree
86	Moringaceae	Moringa oleifera	Horse radish tree	Sojina	Tree
87	Nyssaceae	Nyssa javanica			Tree
88	Phyllanthaceae	Phyllanthus emblica	Amla		Tree
89		Bridelia montana	Willd	Kaisu	Tree
90	Papilionaceae	Derris indica		Koros	Tree
91		Sesbania cannabina		Dhonosa	Tree
92		Butea parviflora		Hatibondha lata	Tree
93		Pterocarpus santalinus	Red sandalwood	Roktosondon	Tree
94	Poaceae	Bambusa arundinacea	Giant thorny Bamboo	Ketuwa	Tree
95	Pandanaaceae	Pandanus odoratus	Screw-pine		Tree
96		Pandanus fascicularis	Screw-pine	Keteki phul	Tree
97	Puniaceae	Punica granatum	Pomegranate	Dalim	Tree
98	Rhamnaceae	Ziziphus mauritiana	Bogori		Tree
99	Rosaceae	Prunus jenkinsii	Thereju	Thereju tenga	Tree
100	Rubiaceae	Anthocephalus chinensis	Neolamarckia cadamba	Kodom	Tree
101	Rutaceae	Citrusgrandis	Pommelo shaddock	Robab tenga	Tree
102		Citrus medica	Citron	Jora tenga	Tree
103		Citrus paradise	Grape fruit	Gul nemu	Tree
104		Citrus reticulata	Orange	Komola tenga	Tree
105		Citrus sinensis	Sweet oranges	Mousumi	Tree
106		Aegle marmelos	Wood apple	Bel Gos	Tree
107		Murrya koenzii	Curry leaf plant	Noroh hingho	Tree
108		Murrya paniculata	Orange jessamine	Kaminikanchon	Tree
109		Zanthoxylum rhetsa	Cape yellowwood	Bojarmoni gos	Tree

Table 13: Diversity of Tree species

Sl. No.	Family	Species	English Name	Vernacular Name	Plant Type
110		Citrus aurantium			Tree
111	Sapotaceae	Mimusops elengi	Bakul		Tree
112	Sapindaceae	Aesculus assamica	East Himalayan Horse Chestnut	Raman bih.	Tree
113	Sonneratiaceae	Duabanga grandiflora	Beremban bukit	Khokon	Tree
114	Thymelaeaceae	Aquilaria malaccensis	The Eagle wood tree	Hasigos	Tree
115		Gmelina arborea	Gamhar		Tree
116		Premna benghalensis		Gohora	Tree
117	Verbenaceae	Tectona grandis	Teak		Tree

II Faunal diversity in the Gauhati University Campus

A: Vertebrate Diversity

Table 14: Mammalian diversity

Sl. No.	Common Name	Scientific Name
1	Common Leopard	<i>Panthera pardus</i>
2	Fishing Cat	<i>Prionailurus viverrinus</i>
3	Indian Jackal	<i>Canis aureus indicus</i>
4	Slow Loris	<i>Nycticebus coucang</i>
5	Rhesus Monkey	<i>Macaca mullata</i>
6	Common Palm Civet	<i>Paradoxurus hermaphrodites</i>
7	Small Indian Civet	<i>Viverricula indica</i>
8	Large Indian Civet	<i>Viverra zibettha</i>
9	Spotted Linsang	
10	Mongoose	<i>Helogale parvula</i>
11	Himalayan Hoary-bellied Squirrel	<i>Callosciurus pygerythrus</i>
12	Lesser Bandicoot-Rat	<i>Bandicota bengalensis</i>
13	Large Bandicoot-Rat	<i>Bandicota indica</i>
14	House Rat	<i>Rattus rattus</i>
15	House Mouse	<i>Mus musculus</i>

Table 14: Mammalian diversity

Sl. No.	Common Name	Scientific Name
16	House Shrew	<i>Suncus murinus</i>
17	Savi's Pygmy Shrew	<i>Suncus etruscus</i>
18	Himalayan Crestless Porcupine	<i>Hystrix brachyuran</i>
19	Indian Flying Fox	<i>Pteropus giganteus</i>
20	Asiatic Greater Yellow House Bat	<i>Scotophilus heathii</i>
21	Mount Popa Pipistrelle	<i>Pipistrellus paterculus</i>
22	Javan Pipistrelle	<i>Pipistrellus javanicus</i>
23	Least Pipistrelle	<i>Pipistrellus tenuis</i>

Table 15: Avian diversity

Sl. No.	Family	Common Name	Scientific Name
1	Phalacrocoracidae	Little Cormorant	<i>Phalacrocorax niger</i>
		Great Cormorant	<i>P. carbo</i>
1	Ardeidae	Grey Heron	<i>Ardea cinerea</i>
		Purple Heron	<i>A. purpurea</i>
		Indian Pond Heron	<i>Ardeola grayii</i>
		Cattle Egret	<i>Bubulcus ibis</i>
		Intermediate Egret	<i>Mesophoyx intermedia</i>
		Little Egret	<i>Egretta garzetta</i>
		Great Egret	<i>Ardea alba</i>
		Black Crowned Night Heron	<i>Nycticorax nycticorax</i>
		Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>
	Black Bittern	<i>Ixobrychus flavicollis</i>	
3	Ciconiidae	Lesser Adjutant Stork	<i>Leptoptilos javanicus</i>
		Greater Adjutant stork	<i>Leptoptilos dubius</i>
		Asian Openbill Stork	<i>Anastomus oscitans</i>
4	Dendrocygnidae	Fulvous Whistling Teal	<i>Dendrocygna bicolor</i>
		Lesser Whistling Teal	<i>D. javanica</i>
5	Anatidae	Ruddy Shelduck	<i>Tadorna ferruginea</i>
		Garganey	<i>Anas querquedula</i>
		Red Crested Pochard	<i>Netta rufina</i>
		Common Pochard	<i>Aythya farina</i>
		Gadwall	<i>Anas strepera</i>
		Eurasian Wigeon	<i>Anas Penelope</i>
		Northern Pintail	<i>Anas acuta</i>
		Common Teal	<i>Anas crecca</i>
	Northern Shoveler	<i>Anas clypeata</i>	
6	Rallidae	Water Rail	<i>Rallus aquaticus</i>

Table 15: Avian diversity

Sl. No.	Family	Common Name	Scientific Name
		Whitebreasted Waterhen	<i>Amaurornis phoenicurus</i>
		Common Moorhen	<i>Gallinula chloropus</i>
		Water Cock	<i>Gallicrex cinerea</i>
7	Jacaniidae	Bronze Winged Jacana	<i>Metopidius indicus</i>
8	Charadriidae	Red-wattled Lapwing	<i>V. indicus</i>
9	Scolopacidae	Common Snipe	<i>Gallinago gallinago</i>
		Solitary Snipe	<i>Gallinago solitaria</i>
		Common Sandpiper	<i>Actitishypoleucos</i>
10	Rostratulidae	Painted Snipe	<i>Rostratula benghalensis</i>
11	Accipitridae	Black Kite	<i>Milvus migrans</i>
		Longbilled Vulture	<i>G. indicus</i>
		Griffon Vulture	<i>Gyps fulvus</i>
		Red-headed Vulture	<i>Sarcogyps calvus</i>
		White-rumped vulture	<i>Gyps bengalensis</i>
		Eurasian Sparrow Hawk	<i>Accipiter nisus</i>
		Besra	<i>Accipiter virgatus</i>
		Shikra	<i>Accipiter badius</i>
		Pied Harrier	<i>Circus melanoleucos</i>
		Crested Serpent Eagle	<i>Spilornis cheela</i>
12	Columbidae	Oriental Turtle Dove	<i>Streptopelia orientalis</i>
		Spotted Dove	<i>S. chinensis</i>
		Eurasian Collard Dove	<i>S. decaocto</i>
		Emerald Dove	<i>Chalcophaps indica</i>
		Yellow-footed Green Pigeon	<i>T. phoeniccoptera</i>
		Green Imperial Pigeon	<i>Ducula aenea</i>
13	Psittacidae	Alexandrine Parakeet	<i>Psittacula eupatria</i>
		Rose-ringed Parakeet	<i>P. krameri</i>
		Red-brested Parakeet	<i>P. alexandri</i>
14	Eopsaltridae	Grey-headed Canary-Flycatcher	<i>Culicicapa ceylonensis</i>
15	Apodidae	Asian palm swift	<i>Cyepsiurus balasiensis</i>
		Himalayan Swiftlet	<i>Collachia brevirostris</i>
		House Swift	<i>Apus nipalensis</i>
16	Camprimulgidae	Large-tailed Nightjar	<i>Camprimulgus macrurus</i>
17	Strigidae	Spotted Owlet	<i>Athene brama</i>

Table 15: Avian diversity

Sl. No.	Family	Common Name	Scientific Name
		Collared Scops Owl	<i>Otus (bakkamoena)lettia</i>
		Asian Barred Owlet	<i>Glaucidium cuculoides</i>
		Burmese Scop Owl	
		Brown Fish Owl	<i>Ketupa zeylonensis</i>
		Brown Hawk Owl	<i>Ninox scutulata</i>
18	Tytonidae	Barn Owl	<i>Tyto alba</i>
19	Picidae	Greater Flameback	<i>Chrysocolaptes lucidus</i>
		Lesser Goldenback	<i>Dinopium benghalensis</i>
		Fulvous-breasted Woodpecker	<i>D. macei</i>
		Grey-faced Woodpecker	<i>Picus canus</i>
		Yellow-crowned Woodpecker	<i>Dendrocopos mahrattensis</i>
		Rufous Woodpecker	<i>Micropternus brachyurus</i>
20	Megalaimidae	Lineated Barbet	<i>Megalaima lineata</i>
		Blue-throated Barbet	<i>M. asiatica</i>
		Coppersmith Barbet	<i>M. haemacephala</i>
21	Upupidae	Eurasian Hoopoe	<i>Upupa epops</i>
22	Coraciidae	Indian Roller	<i>Coracias benghalensis</i>
23	Alcedinidae	Common Kingfisher	<i>Alcedo atthis</i>
24	Dacelonidae	Stork-billed Kingfisher	<i>Pelargopsis capensis</i>
		White-throated Kingfisher	<i>Halcyon smyrnensis</i>
25	Cerylidae	Pied Kingfisher	<i>Ceryle rudis</i>
26	Meropidae	Little Green Bee-eater	<i>Merops orientalis</i>
		Blue-tailed Bee-eater	<i>M. philippinus</i>
27	Cuculidae	Pied Cuckoo	<i>Oxylophus jacobinus</i>
		Greater Coucal	<i>Centropus chinensis</i>
		Lesser Coucal	<i>Centropusbengalensis</i>
		Common Hawk-Cuckoo	<i>Heirococcyx varius</i>
		Indian Cuckoo	<i>C. micropterus</i>
		Common Cuckoo	<i>C. canorus</i>
		Asian Koel	<i>Eudynamys scolopacea</i>
		Green-billed Malkoha	<i>Rhopodytes tristis</i>
		Plantative Cuckoo	<i>Cacomantis merulinus</i>
		Eurasian Cuckoo	<i>Cuculus canorus</i>
		Common Hawk Cuckoo	<i>Hierococcyx varius</i>

Table 15: Avian diversity

Sl. No.	Family	Common Name	Scientific Name
		Chestnut-winged Cuckoo	<i>Clamator coromandus</i>
28	Irenidae	Goldenfronted Leaf-bird	<i>C. aurifrons</i>
29	Lanidae	Longtailed Shrike	<i>Lanius schach</i>
		Brown Shrike	<i>L. cristatus</i>
		Greybacked Shrike	<i>L. tephronotus</i>
30	Corvidae	Rufous Treepie	<i>Dendrocitta vagabunda</i>
		House Crow	<i>Corvus splendens</i>
		Jungle Crow	<i>C. levaillantii</i>
		Blackhooded Oriole	<i>O. xanthornus</i>
		Large Hawk-cuckoo	<i>Coracina macei</i>
		Common Iora	<i>Aegithina tiphia</i>
		Scarlet Minivet	<i>P. flammeus</i>
		Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>
		Haircrested Drongo	<i>D. hottentottus</i>
		Lesser Racket-tailed Drongo	<i>D. remifer</i>
		Black Drongo	<i>D. macrocercus</i>
		Bronzed Drongo	<i>D. aeneus</i>
		Whit-ethroated Fantail	<i>R. albicollis</i>
31	Muscicapidae	Grey headed canary flycatcher	<i>Culicicapa ceylomensis</i>
		Oriental Magpie robin	<i>Copsychus saularis</i>
		Shama	<i>Copsychus malabaricus</i>
		Common Stonechat	<i>Saxicola torquata</i>
		Tailor Bird	<i>Orthotomus sutorius</i>
		Aberrant Bush Warbler	<i>Cettia flavolivacea</i>
		Blue Whistling Thrush	<i>Myophonus caeruleus</i>
		Orange-headed Thrush	<i>Zoothera citrina</i>
32	Sturnidae	Chestnut-tailed Starling	<i>Sturnus malabaricus</i>
		Asian Pied Starling	<i>S. contra</i>
		Common Myna	<i>Acridotheres tritis</i>
		Jungle Myna	<i>A. fuscus</i>
		Hill Myna	<i>Gracula religiosa</i>
		Great Myna	<i>Acridotheres grandis</i>

Table 15: Avian diversity

Sl. No.	Family	Common Name	Scientific Name
33	Paridae	Great Tit	<i>Parus major</i>
34	Hirundinidae	Barn Swallow	<i>Hirundo rustica</i>
35	Pycnonotidae	Redvented Bulbul	<i>P. cafer</i>
		Black Bulbul	<i>Hypsipetes leucocephalus</i>
		Red Whiskered Bulbul	<i>Pycnonotus jocosus</i>
36	Sylviidae	Common Tailorbird	<i>Orthotomus sutorius</i>
		Dusky Warbler	<i>Phylloscopus collybita</i>
		Tickell's Leaf Warbler	<i>P. affinis</i>
		Striated Marsh Warbler	<i>Megalurus palustris</i>
37	Timalidae	Marsh Babbler	<i>Pellorneum palustre</i>
		Jungle Babbler	<i>Turdoides striatus</i>
38	Nectarinidae	Purple rumped sunbird	<i>Leptocoma zeylonica</i>
		Crimson sunbird	<i>Aethopyga siparaja</i>
39	Dicaeidae	Scarletbacked Flowerpecker	<i>Dicaeum cruentatum</i>
40	Passeridae	House Sparrow	<i>Passer domesticus</i>
		Tree Sparrow	<i>p. montanus</i>
		White Wagtail	<i>Motacilla alba</i>
		Citrine Wagtail	<i>M. citreola</i>
		Paddyfield Pipit	<i>Anthus rufulus</i>
		Scalybreasted Munia	<i>L. punctulata</i>
		White Rumped Munia	<i>L. striata</i>
		Olive Backed Pipit	<i>Anthus hodgsoni</i>

Table 16: Amphibian diversity

Sl. No.	Common name	Scientific Name
1.	Assam Forest Frog-Family(Ranidae)	<i>Sylvirana leptoglossa</i>
2.	Bhamo Frog-Family (Ranidae)	<i>Humerana humeralis</i>
3.	Common Asian Toad-Family(Bufonidae)-	<i>Duttaphrynus melanostictus</i>
4.	Common Tree Frog-Family(Rhaphoridae)	<i>Polypedates teraiensis</i>
5.	Indian Bull Frog-Family(Ranidae)-	<i>Haplobatrachus tigerina</i>
6.	Crasus Frog	<i>Haplobatrachus crassus</i>
7.		<i>Phajerveria terainsis</i>
8.		<i>Microhyla ornate</i>
9.		<i>Phajerveria</i>
10.	Indian balun From	

Table 17: Snake diversity in Gauhati University Campus

Sl. No.	Common name	Scientific Name
1	White Lipped Pit Viper(Family- Viperidae)	<i>Cryptelytrops albolabris</i>
2	Red-necked Keelback (Family-Colubridae)	<i>Rhabophis subminiatus</i>
3	Monocled Cobra(Family-Elapidae)	<i>Naja kaouthia Lesson</i>
4	Copper-headed Trinket Snake(Family-Colubridae)	<i>Coelognathus radiates</i>
5	Common Wolf Snake(Family-Colubridae)	<i>Lycodon aulicus</i>
6	Indian Rat Snake(Family-Colubridae)	<i>Ptyas mucosa</i>
7	Brahmioni Blind- Snake(Family-Typhlopidae)	<i>Ramphotyphlops braminus</i>
8	Ornate Flying Snake(Family-Colubridae)	<i>Chrysopela ornate</i>
9	Indian python (Family – Pythonidae)	<i>Python molurus</i>
10	Chekered keelback	<i>Xenochrophis piscator</i>
11	Water Snake	<i>Nerodia sipedon</i>

Table 18: Diversity of Lizards in Gauhati University campus

Sl. No.	Common Name	Scientific Name
1.	Tokay gecko	<i>Gecko gecko</i>
2.	Common house gecko	<i>Hemidactylus frenatus</i>
3.	Oriental garden lizard	<i>Calotes versicolor</i>
4.	Monitor Lizard	<i>Varanus bengalensis</i>
5.	Common garden Skink	<i>Lampropholis guichenoti</i>
6	House Lizard	<i>Hemidactylus frenatus</i>
7	Flat Tailed Gecko	<i>Hemidactylus platyurus</i>
8	Garnot's House Gecko	<i>Hemidactylus garnotii</i>
9	White-spotted Supple Skink	<i>Lygosoma albopunctata</i>
10	Spotted forest skink	<i>Sphenomorphus maculatus</i>
11	Indian Forest Skink	<i>Sphenomorphus indicus</i>
12	East Indian brown Mabuya/ Many striped Skink	<i>Eutropis multifasciata</i>

Table 19: Diversity of Turtle fauna

Sl. No.	Common name	Scientific Name
1.	Sotted pond turtle	<i>Geoclemys hecumiltonii</i>
2.	Indian tent turtle	<i>Pangura tentoria</i>
3.	Indian eyed turtle	<i>Morenia petersi</i>
4.	Indian soft shell turtle	<i>Nilssonina gangeticus</i>
5.	Peacock soft shell turtle	<i>Nilkssonina hurum</i>

B: Diversity of Fish fauna

Table 20

Sl. No.	Scientific Name
1	<i>Oreochromis mossambicus (exotic)</i>
2	<i>Anabas testudineus</i>
3	<i>Tricogaster fasciata</i>
4	<i>Channa punctata</i>
5	<i>Channa gachua</i>
6	<i>Puntius sophore</i>
7	<i>Puntius chola</i>
8	<i>Danio rerio</i>
9	<i>Notopterus notopterus</i>
10	<i>Macrornathus aral</i>
11	<i>Clarias magur</i>
12	<i>Heteropneustes fossilis</i>
13	<i>Mystus tengra</i>
14	<i>Monopterus cuchia</i>
15	<i>Esomus dandrica</i>

C: Invertebrate Diversity

Table 21: Diversity of Butterfly fauna in Gauhati University Campus

Sl. No.	Family/ Subfamily	Common Name	Scientific Name
1	Nymphalidae/ Amathusiinae	Common Duffer	<i>Discophora sondiaca zal Westwood</i>
2	Satyrinae	Common Evening Brown	<i>Melanitis leda ismene (Cramer)</i>
		Dark Evening Brown	<i>Melanitis phedima bela, Moore</i>
		Common Palmfly	<i>Elymnias hypermnestra undularis (Drury)</i>
		Spotted Palmfly	<i>Elymnias malelas malelas (Hewitson)</i>
		Bluestriped Palmfly	<i>Elymnias patna patna (Westwood)</i>
		Bamboo Treebrown-	<i>Lethe europa niladana, Fruhstorfer</i>
		Banded Trebrown-	<i>Neope confusa confusa, Aurivillius</i>

Table 21: Diversity of Butterfly fauna in Gauhati University Campus

Sl. No.	Family/ Subfamily	Common Name	Scientific Name
		Common Bushbrown-	<i>Mycalesis perseus blasius</i> (Fabricius)
		Darkbrand Bushbrown-	<i>Mycalesis mineus mineus</i> (Linnaeus)
		Nigger-	<i>Orsotrioena medus medus</i> (Fabricius)
		Common Fivering-	<i>Yapthima baldus baldus</i> (Fabricius)
		Chinese Bush Brown	<i>Mycalesis gotoma</i>
3	Charaxinae	Tawny Rajah-	<i>Charaxes polyxena hierax</i> , Felder
		Yellow Rajah-	<i>Charaxes marmax</i> , Westwood
		Scarce tawny Rajah-	<i>Charaxes aristigiton aristigiton</i> Fabricius
		Common Nawab-	<i>Polyura athamas athamas</i> (Drury)
		Variegated Rajah	<i>C. kaharuba</i> Moore
4	Nymphalinae	Angled Castor-	<i>Ariadne ariadne pallidior</i> (Frusthorfer)
		Common Castor-	<i>Ariadne merione assama</i> (Evans)
		Common Leopard	<i>Phalanta phalantha</i> (Drury)
		Large Yeoman-	<i>Cirrochroa aoris aoris</i> Doubleday
		Common Yeoman-	<i>Cirrochroa tyche mithila</i> , Moore
		Vagrant-	<i>Issoria sinha sinha</i> (Kollar)
		Indian Fritillary-	<i>Argyreus hyperbius hyperbius</i> (Johans)
		Lemon Pansy-	<i>Precis lemonias lemonias</i> (Linnaeus)
		Peacock Pansy-	<i>Precis almana almana</i> (Linnaeus)
		Grey Pansy-	<i>Precis atlites atlites</i> (Johanssen)
		Chocolate Soldier-	<i>Precis iphita iphita</i> (Cramer)
		Common Jester-	<i>Symbrenthia lilaea khasiana</i> , Moore
		Great Eggfly-	<i>Hypolimnias bolina</i> (Linnaeus)
		Orange Oakleaf-	<i>Kallima inachus inachus</i> (Boisduval)

Table 21: Diversity of Butterfly fauna in Gauhati University Campus

Sl. No.	Family/ Subfamily	Common Name	Scientific Name
		Common Sailer-	<i>Neptis hyla varmona, Moore</i>
		Great Eggfly	<i>Hypolimnias bolina (Linnaeus)</i>
		Common Sailer-	<i>Neptis sappho adara, Moore</i>
		Yerburi's Sailer-	<i>Neptis yerburi sikkima, Evans</i>
		Sullied sailer	<i>N. soma soma (Moore)</i>
		Short banded Sailer-	<i>P. columella ophian, Moore</i>
		Yellow Jack sailer	<i>Lassipa v. viraja (Moore)</i>
		Common Lascar-	<i>Pantoporia hordonia hordonia (Stoll)</i>
		Orange Staff Sergeant-	<i>Parathyma cama (Moore)</i>
		Colour Sergeant-	<i>P. nefte inara, Db</i>
		Common Sergeant-	<i>P. perius (Linnaeus)</i>
		Commander-	<i>Moduza p. procris (Cramer)</i>
		Knight-	<i>Lebadea martha ismene, Db & Hew</i>
		Grey Count-	<i>Tinacea lepidea lepidea, But</i>
		Grey Count-	<i>T. l. miyana, Fruh</i>
		Common Baron	<i>Euthalia aconthea suddhodana (Frusth.)</i>
		Streaked Baron-	<i>E. jama jamida, Fd.</i>
		Pasha	<i>Herona marathus Doubleday</i>
		Courtesan	<i>Euripus nyctelius (Doubleday)</i>
		Red Spot Duke	<i>Dophla evalina (Stol)</i>
		Plain Earl	<i>Tanaecia jahnu (Moore)</i>
5	Heliconiinae	Leopard Lacewing-	<i>Cethosia cyane, Drury</i>
		Red Lacewing-	<i>C. biblis tisamena, Fabricius</i>
		Cruiser(Female)	<i>Vindula erota</i>
6	Acrainae	Yellow Coster-	<i>Pareba vesta, F</i>
7	Danainae	Glassy Tiger-	<i>Parantica aglea melanoides, (M)</i>
		Blue Tiger-	<i>Tirumala limniace leopardus, (Butler)</i>
		Dark Blue Tiger-	<i>T. septentrionis, (But)</i>
		Common Tiger-	<i>Danaus genutia, (Cramer)</i>
		Plain Tiger-	<i>D. chrysippus, L</i>
		Striped Blue Crow-	<i>Euploea mulciber mulciber, Cr</i>
		Longbanded Blue Crow-	<i>Euploea algae deione, Wd</i>
		Blue Kingcrow-	<i>E. klugii klugii, M</i>
		Common Crow-	<i>E. core core, Cr</i>

Table 21: Diversity of Butterfly fauna in Gauhati University Campus

Sl. No.	Family/ Subfamily	Common Name	Scientific Name
8	Papilionidae/ Papilioninae	Common Jay-	<i>Graphium doson axion</i> (Feld., C. & R.)
		Tailed Jay-	<i>G.a. agammemnon</i> (Lin.)
		Common Bluebottle-	<i>Graphium s. sarpedon</i> (Lin.)
		Glassy Bluebottle-	<i>Graphium cloanthus</i> (West- wood)
		Common Rose-	<i>Pachliopta a. aristolochiae</i> (Fab.)
		Crimson Rose-	<i>Pachliopta hector</i> (Linn)
		Common Birdwing-	<i>Troides helena cereberus</i> (C. & R., Feld.)
		Common Mime-	<i>Chilasa clytia clytia</i> (Lin.)
		Common Mime-	<i>Chilasa clytia dissimilis</i> (Lin.)
		Common Mormon-	<i>Princeps polytes romulus</i> (Cramer)
		Great Mormon-	<i>P. memnon agenor</i> (Lin.)
		Common Raven-	<i>P. castor polas</i> (Jordan)
		Red Helen-	<i>P. h. helenus</i> (Lin.)
		Lime Butterfly-	<i>Princeps demoleus</i> (Lin.)
9	Lycanidae/ Mileti- nae	Apefly	<i>Spalgis e. epius</i> (Westwood)
10	Lycaeninae	Golden Sapphire	<i>Heliophorus brahma</i> (Moore)
11	Curetinae	Angled Sunbeam-	<i>Curetis dentata</i> Moore
12	Theclinae	Common Acacia Blue	<i>Surendra q. quercetorum</i> (Moore)
		Centaur Oakblue-	<i>Nilasera centaurus pirit- hous</i> (Moore)
		Yamfly	<i>Loxura atymnus continen- talis</i> (Fruhsto)
		- Common Red Flash	<i>Rapala jarbas jarbas</i> (Fabri- cius)
		Longbanded Silverline	<i>Spindasis lohita himalayanus</i> (Moore)
13	Polyommatainae	Common Cerulean	<i>Jamides c. celeno</i> (Cramer)
		Metallic Cerulean	<i>J. alecto eurysaces</i> (Frushtor- fer)
		Peablu	<i>Lampides boeticus</i> (Linnaeus)
		Grass Jewel	<i>Zizeeria t. trochilus</i> (Freyer)
		Margined Hedge Blue	<i>Lycaenopsis marginata</i> (De Niceville)
		Quaker	<i>Neopithecops zalmora</i> (Butler)

Table 21: Diversity of Butterfly fauna in Gauhati University Campus

Sl. No.	Family/ Subfamily	Common Name	Scientific Name
		Gram Blue	<i>Euchrysops cnejus (Fabricius)</i>
		Angled Pierrot	<i>Caleta caleta Hewitson</i>
		Common Pierrot	<i>Castalius r. rosimon (Frush- torfer)</i>
		Dark Pierrot	<i>Tarucus ananda (De Niceville)</i>
		Striped Pierrot	<i>T. nara (Kollar)</i>
		Lime Blue	<i>Chilades laius (Cramer)</i>
		Pale Grass Blue	<i>Pseudozizeeria maha (Kollar)</i>
		Forget-Me-not	<i>Catochrysops strabo (Fabri- cius)</i>
		Common Hedge Blue	<i>Acetolepsis puspa gisca (Frush- torfer)</i>
		Plains Cupid	<i>Edales pandava (Horsfield)</i>
14	Riodininae	Punchinello	<i>Zemerus flegyas indicus (Fabricius)</i>
		Plum Judy	<i>Abisara echerius suffuse (Moore)</i>
15	Pyrginae	Common Spotted Flat	<i>Celaenorrhinus leucocera (Kol- lar)</i>
		Fulvous Pied Flat	<i>Coladenia dan festa (Evans)</i>
		Chestnut Angle	<i>Odontoptilum a. angulata (Felder)</i>
		Common Bush Hop- per	<i>Ampittia dioscorides (Felder)</i>
16	Hesperiidae/ Hes- periinae	Chestnut Bob-	<i>Iambrix s. salsala (Moore)</i>
		Chocolate Demon-	<i>Ancistroides nigrita dio- cles(Moore)</i>
		Spotted Demon-	<i>Notocrypta fiesthamelii alysos Moore</i>
		Assam Darter-	<i>Ochlodes s. siva(Moore)</i>
		Restricted Demon	<i>Notocrypta curvifascia</i>
		Spotted Demon	<i>N. fiesthamelii alysos (Moore)</i>
		Indian Palm Bob	<i>Suastus g. gremius (Fabricius)</i>
		Paintbrush Swift	<i>Baoris farri (Moore)</i>
		Purple And Gold Flit- ter	<i>Zographetus satwa (De Niceville)</i>
		Grass Demon-	<i>Udaspes folus (Cramer)</i>
		Wax Dart-	<i>Cupitha purreea Moore</i>
		Blank Swift-	<i>Caltoris kumara (Moore)</i>
		Giant Redeye-	<i>Gangara t. thyrsis(Fab.)</i>

Table 21: Diversity of Butterfly fauna in Gauhati University Campus

Sl. No.	Family/ Subfamily	Common Name	Scientific Name
		Common Redeye-	<i>Matapa aria (Moore)</i>
		Common Dartlet-	<i>Oriens gola pseudolus (Mabille)</i>
		Coon-	<i>Sancus fuligo (Mabille)</i>
17	Pieridae/ Pierinae	Psyche-	<i>Leptosia n. nina (Fab.)</i>
		Indian Cabbage White-	<i>Pieris canidia indica Evans</i>
		Large Cabbage White	<i>P. brassicae nepalensis (Gray)</i>
		Chocolate Albatross-	<i>Appias lyncida elenora (Boisduval)</i>
		Common Albatross	<i>A. albino darada (C&R, Felder)</i>
		Striped Albatross	<i>A. libythea (Fabricius)</i>
		Yellow Orange Tip-	<i>Ixias pyrene familiaris Butler</i>
		Common Gull-	<i>Cepora n. nerissa (Fab.)</i>
		Lesser Gull-	<i>C. n. nadina (Lucas)</i>
		Great Orange Tip-	<i>Hebomoia glaucippe (Lin.)</i>
		Common Jezebel-	<i>Delias eucharis (Drury)</i>
		Redbase Jezebel-	<i>D. a. aglaia (Lin.)</i>
		Redspot Jezebel-	<i>D.d. descombesi (Boisduval)</i>
		Painted jezebel-	<i>D. hyparete indica Wallace</i>
18	Coliadinae	Common Emigrant-	<i>Catopsila pomona (Fab.)</i>
		Mottled Emigrant-	<i>C. pyranthe (Lin.)</i>
		Tree Yellow-	<i>Gandaca harina assamica Moore</i>
		Small Grass Yellow-	<i>Eurema brigitta rubella Wallace</i>
		Common Grass Yellow-	<i>E. hecabe contubernalis (Moore)</i>
		Three Spot Grass Yellow-	<i>E. blanda silhatana (Wallace)</i>
		One-Spot Grass Yellow	<i>E. a. andersoni (Moore)</i>

Table 22: Diversity of Draginfly (Odonate)

Sl. No.	Common Name	Scientific Name
1	Common Clubtail	<i>Ictinogomphus rapax</i>
2	Blue Darner	<i>Anax immaculiforns</i>
3	Parakeet Darner	<i>Gynancantha bayedera</i>

Table 22: Diversity of Dragonfly (Odonate)

Sl. No.	Common Name	Scientific Name
4	Common picture wing	<i>Rhyothemis variegata</i>
5	Fulvous forest skimmer	<i>Neurothemis fulvia</i>
6	Blue tailed forest hawk	<i>Orthetrum triangulare</i>
7	Trumpet tail	<i>Acisoma panorpoides</i>
8	Ruddy marsh skimmer	<i>Crocothemis servilia</i>
9	Coral tailed cloud wing	<i>Tholymis tillarga</i>
10	Rufous marsh glider	<i>Rhodothemis rufa</i>
11	Pied paddy skimmer	<i>Neurothemis tullia</i>
12	Scarlet marsh hawk	<i>Aethriamanta brevipennis</i>
13	Ground skimmer	<i>Diplocodes trivialis</i>
14	Black tipped ground skimmer	<i>Diplocodes nebulosa</i>
15	Blue marsh hawk	<i>Orthetrum glaucum</i>
16	Green marsh hawk	<i>Orthetrum sabina</i>
17	Ditch jewel	<i>Brachythemis contaminata</i>
18	Crimson-tailed marsh hawk	<i>Orthetrum pruinosum</i>
19	Rufous backed marsh hawk	<i>Brachydiplax chalybea</i>
20	Little blue marsh hawk	<i>Brachydiplax sobrina</i>
21	Emerald flanked marsh hawk	<i>Brachydiplax farinosa</i>
22	Asiatic bloodtail	<i>Lathrecista asiatica</i>
23	Tricoloured marsh hawk	<i>Orthetrum luzonicum</i>
24	Wandering glider	<i>Pantala flavescens</i>
25	Yellow tailed ashy skimmer	<i>Potamarcha congener</i>
26	Black stream glider	<i>Thithemis festiva</i>
27	Long legged marsh glider	<i>Trithemis pallidinervis</i>
28	Blue tailed yellow skimmer	<i>Palpopleura sexmaculata</i>

Table 23: Diversity of Damselfly (Zygoptera)

Sl. No.	Common Name	Scientific Name
1	White dartlet	<i>Agriocnemis pieris</i>
2	Pigmy dartlet	<i>Agriocnemis pygmaea</i>
3	Indian hooded dartlet	<i>Agriocnemis kalinga</i>
4	Golden dartlet	<i>Ischnura aurora</i>
5	Milky dartlet	<i>Agriocnemis lacteola</i>
6	Orange tailed marsh dart	<i>Ceriagrion cerinorubellum</i>
7	Coromandel marsh dart	<i>Ceriagrion coromandelianum</i>
8	Rusty marsh dart	<i>Ceriagrion olivaceum</i>
9	Black tailed marsh dart	<i>Ceriagrion fallax</i>
10	Saffron faced blue dart	<i>Pseudagrion rubriceps</i>
11	Elegant sprite	<i>Pseudagrion decorum</i>

Table 23: Diversity of Damselfly (Zygoptera)

Sl. No.	Common Name	Scientific Name
12	Black marsh dart	<i>Onychargia atrocyana</i>
13	Pruinosed dartlet	<i>Agriocnemis femina</i>
14	Blue dart	<i>Pseudagrion microcephalum</i>
15		<i>Mortonagrion aborense</i>
16	Pied bush dart	<i>Pseudocopera ciliata</i>
17	Blue bush dart	<i>Copera vittata</i>
18	Orange marsh dart	<i>Ceriagrion rubiae</i>
19	Yellow bush dart	<i>Copera marginipes</i>
20		<i>Agriocnemis pallidum</i>

Table 24: Diversity of Spider

Sl. No.	Family	Scientific Name/ (Common name)
1	Araneidae	Argiope pulchella(Garden Cross spider)
2		Argiope catenulata(Grass Cross spider)
3		Araneus mitificus(Kidney Garden spider)
4		Cyclosa bifida(Trashline orbweaver)
5		Cyrtophora citricola(Tropical Tent web spider)
6		Eriovixia excelsa(Dark Bird dropping spider)
7		Gasteracantha kuhli(Spiny orb weaver)
8		Neoscona mukerjei(Common Garden spider)
9		Neoscona bengalensis
10		Arachnura sp. (Scorpion tailed spider)
11		Nephila pilipes(Giant Golden Orb-weaver)
12		Nephila maculata(Giant Wood spider)
13	Eutichuridae	Cheiracanthium sp. (Yellow sac spider)
14	Oxyopidae	Oxyopes shweta(White Lynx spider)
15		Oxyopes javanus(Lynx spider)
16		Hamadruas sikkimensis
17	Pholcidae	Artema atlanta
18		Pholcus sp. (Cellar spider)
19		Crossopriza lyoni
20	Pisauridae	Perenethis sp.
21	Salticidae	Hasarius adansoni(Adanson's Wall jumper)
22		Menemerus bivittatus(Common wall jumper)
23		Myrmarachne sp.
24		Plexippus paykulli(Pantropical Jumping spider)
25		Plexippus petersi
26		Hyllus semicupreus (Heavy bodied jumper)
27		Telamonia dimidiata

Table 24: Diversity of Spider

Sl. No.	Family	Scientific Name/ (Common name)
28	Scytodidae	Scytodes sp. (Spitting spider)
29	Sparassidae	Heteropoda venatoria(Huntsman spider)
30	Theridiidae	Argyroides argentatus
31		Argyroides flavescens
32		Meotipa sp. (Spiny theridiid spider)
33		Chikunia sp
34	Thomisidae	Camaricus formosus
35		Oxytate virens
36		Synema revolutum
37		Xysticus minutus
38		Thomisus sp. (Crab spider)
39	Theraphosidae	Chilobrachys sp.
40	Uloboridae	Uloborus sp.

Table 25: Diversity of Coleopteran

Sl. No.	Family	Scientific Name
1	Atlelabidae	<i>Trachdophorus giraffa</i>
2	Chrysomelidae	<i>Aulacophora sp.</i>
3		<i>Charidotella sexpunctata</i>
4		<i>Chrysolina coerulans</i>
5		<i>Deloyala guttata</i>
6		<i>Hoplasoma unicolor</i>
7		<i>Podagrica fuscicornis</i>
8		<i>Lilioceris lili</i>
9		<i>Monolepta signata</i>
10		<i>Metriona bicolor</i>
11		<i>Unknown sp.</i>
12	Cantharidae	<i>Chauliognathus lugubris</i>
13	Coccinellidae	<i>Coccinella septempunctata</i>
14		<i>Ezochomus quadripustulatus</i>
15		<i>Epilachna vigintioctopunctata</i>
16		<i>Propylea gualtuordecimpunctata</i>
17		<i>Rodolia rufopilosa</i>
18	Curculionidae	<i>Hypomeces sp</i>
19		<i>Hypera sp</i>
20	Scarabaeidae	<i>Aphodius fasciatus</i>
21		<i>Serica mystaca</i>