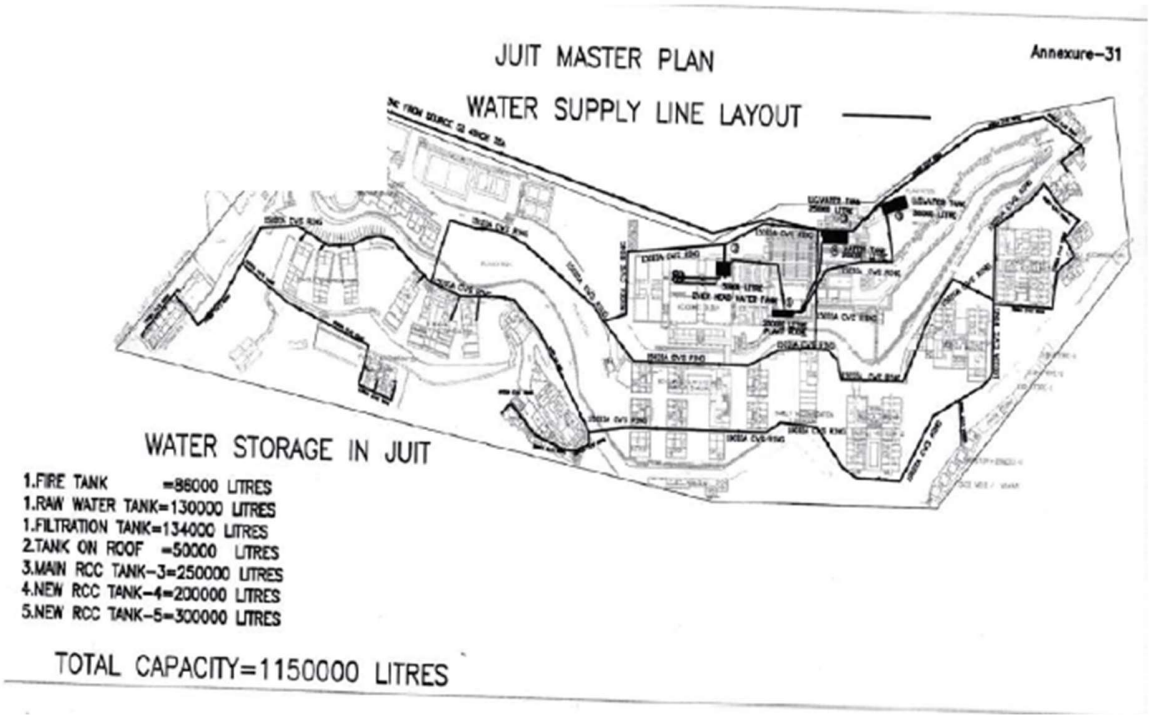
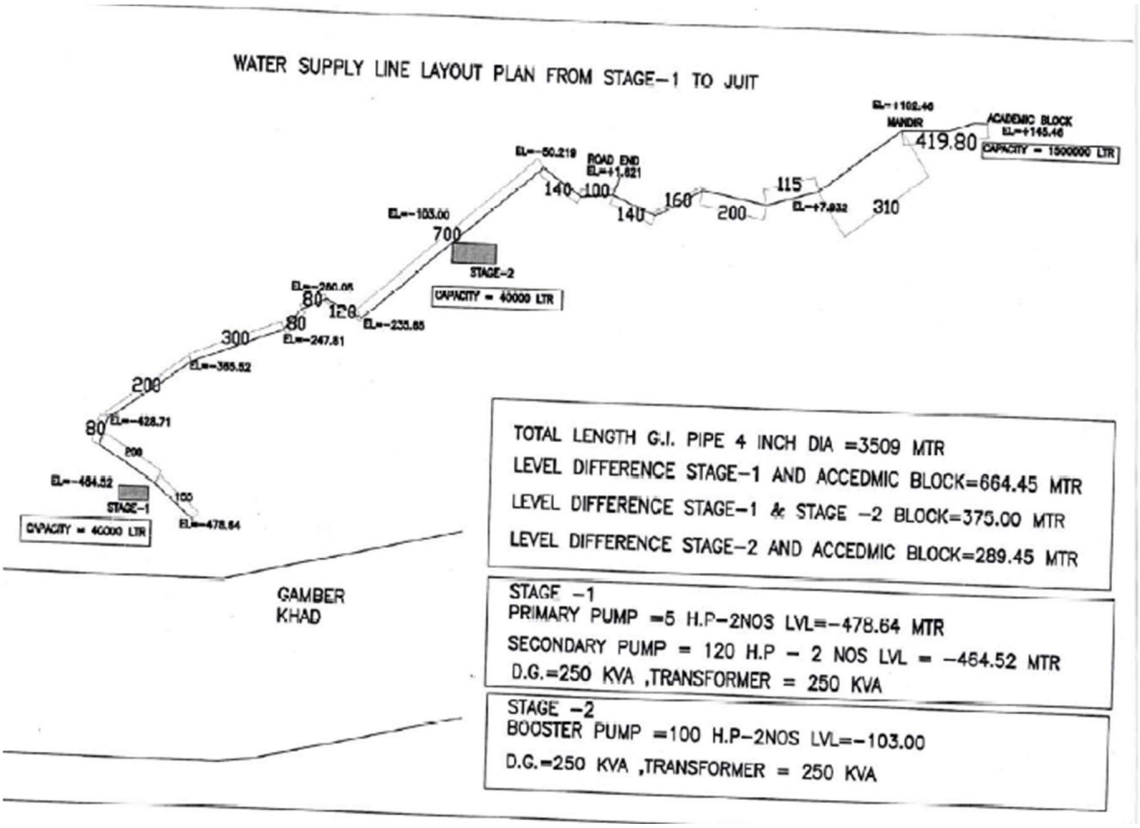
Evidence against indicators 6.5.3 and 6.5.4

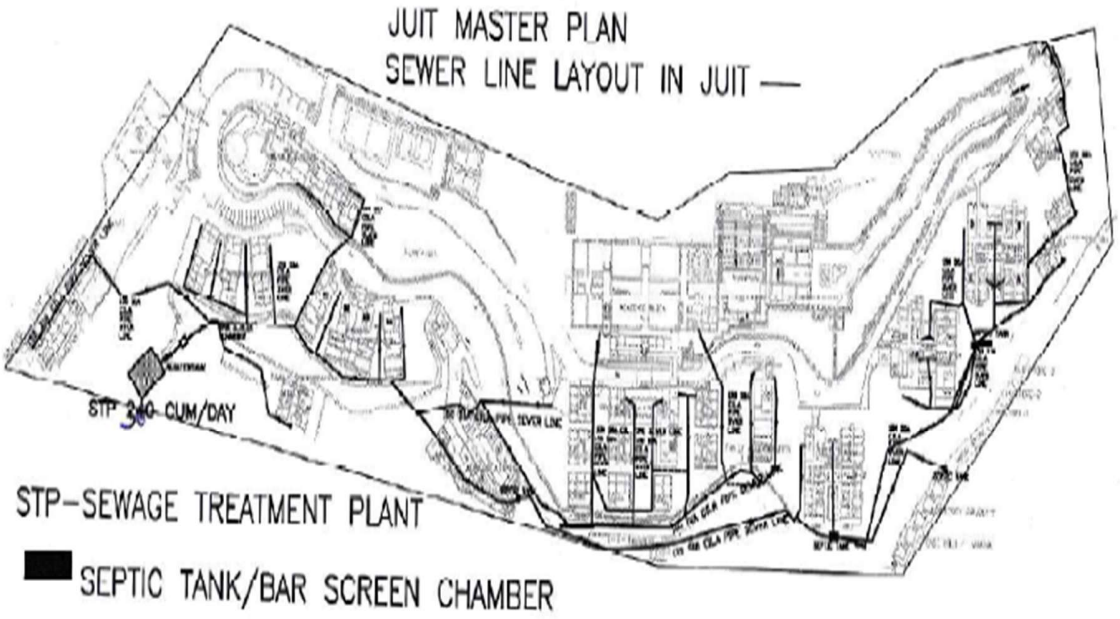
Metric and indicator reference	Metric / Indicator	Comments/Data	Yes/No	Evidence1	Public (Yes/No)
6.5.3	Sustainable water extraction on campus Where water is extracted (for example from aquifers, lakes or rivers) utilise sustainable water extraction technologies on associated university grounds on and off campus.	The University maintains it borewells/pumps for water extraction in order to satisfy its daily needs.	Yes	Declaration on letter head. - Gambarghat extraction	Yes
6.5.4	Cooperation on water security Cooperate with local, regional, national, or global governments on water security.		Yes (local)		
	Local	The University has agreement with locals on water security.	Yes	Declaration on letter head. - Agreement between gram panchayat and JUIT	Yes
	Regional		No		
	National		No		

Layout Plan (1) : Master Plan: Water distribution system in the campus





Annexure–18


JUIT MASTER PLAN
SEWER LINE LAYOUT IN JUIT —
STP 340 CUM/DAY
STP–SEWAGE TREATMENT PLANT
SEPTIC TANK/BAR SCREEN CHAMBER

Water testing report

H.P.STATE POLLUTION CONTROL BOARD
FORM X
REPORT BY STATE BOARD ANALYST
(See Rule 26)

Report No: 95888/W-7785 **25/05/2023**

I hereby certify that I **Rama Kant Awasthi , SO**, State Board Analyst duly appointed under sub-section (3) of section 53 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) received on **03/05/2023** from **Anurag Raina, JEE**, HP State Pollution Control Board **RO Parwanoo** a **Grab** sample of **Final Outlet of STP** of **Jaypee University Of Information Technology, Vaknaghat VPO Waknaghat, Tehsil Kandaghat, District Solan, H.P.Waknaghat, Arki** Distt. **Solan Parwanoo**, H.P. **173234** on dated **02/05/2023** for analysis. The sample was in a condition fit for analysis reported below:

I further certify that I have analyzed the aforementioned sample on **03/05/2023** to **25/05/2023** and declare the result of analysis is to be as follows :-

Method of analysis					
IS- 2488(I-V), IS-3025(Part 44): 1933, 'Standard method for examination of water', 22th edition prepared and published jointly by:-					
1. American Public Health Association 2. American Water Works Association 3. Water Pollution Control Federation					
SAMPLING PARAMETERS					
Sr. No.	**Parameter Name**	**Results**	**Units**	**Permissible Limit**	**Remark/Result Analysis**
1	pH	7.44		6.5-9.0	Within Permissible Limit
2	TSS	10.0	mg/L	99	Within Permissible Limit
3	BOD	6.0	mg/L	30	Within Permissible Limit
4	Oil and Grease	0.4	mg/L	10	Within Permissible Limit
5	COD	56.0	mg/L	250	Within Permissible Limit

The condition of the seals, fastening and container on receipt was as: sealed as **HPPCB262**

Signed this on **25/05/2023**

Remarks of Lab Head:

-

Rama Kant Awasthi , SO
(State Board Analyst)
CL Parwanoo

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY

(Established by H.P. State Legislature vide Act No. 14 of 2002)
P.O. Waknaghat, Teh. Kandaghat, Distt. Solan - 173234 (H.P.) INDIA
Website : www.juit.ac.in
Phone No. +91-01792-257999 (30 Lines)
Fax : +91-01792-245362

To whomsoever it may concern

1. The main source of water is a hilly spring from which the water is lifted to the University using three-stage pumps.
2. The total volume of water used in the university campus is 350 m^3/day with a campus population of ~ 2800 (including students). The water is catered free to all the campus residents.
3. There is water treatment plant for drinking, laundry and other purposes.
4. There is a Sewerage treatment plant to treat the waste water and for further use in gardening as per water reuse policy.
5. There is a rain water harvesting unit.
6. JUIT donates ~ 50,000 litres/day of water to the village population nearby.

Manoj Sharma
(Chief Engineer)

GREEN AUDIT REPORT

MAY 2022

Jaypee University of Information Technology Waknagat, P.O. Waknaghat, Teh Kandaghat, Distt. Solan pin-173234 (H.P), India

Audit Conducted by:

ENGINEERING FACILITY SERVICES
Office No.778-779, Gaur City Mall, Sector-04, Greater Noida (Uttar Pradesh) India, 201318; E-mail.; efs_info@yahoo.com; Mo: 8826682703
Energy Service Companies empaneled with Bureau of Energy Efficiency (BEE)

Table of Contents

1. ACKNOWLEDGEMENT

EFS, Engineering Facility Services acknowledges the cooperation and support of the management and staff of **Jaypee University of Information Technology,** in particular, the support and disposition of the **Mr. A.P. Khare (Senior Project Engineer), Mr. Jasveer Singh (Engineer Electrical Department) & Mr. Manoj Kumar Sharma (Deputy Chief Engineer, Civil)** Teaching/Supporting Staff of institute has been invaluable to the success of this report. EFS Engineering Facility Services wishes to stress that in line with its policy, all information obtained in the course of this Audit exercise, as well as those contained in this report, will be accorded the strictest confidentiality.

2. Executive Summary:

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crisis. On this background it becomes essential to adopt the system of the green campus for the institute which will lead to sustainable development. Jaypee University of Information Technologyis deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends. Being a premier institution of higher studies, the college has initiated **'' The Green Campus''**programme few years back that actively promote the various projects for the environment protection and sustainability.

The purpose of this audit is to ensure that the practices followed in the campuses are in accordance with the green policy adopted by the institution. It works on several facets of Green Campus including water conservation, electricity conservation, tree plantation, waste management, paperless work, mapping of biodiversity. With these issues in mind, the specific objectives ofthe audit are to evaluate the adequacy ofthe management control framework of environment sustainability as well as the degree to which the departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on students' health and learning, college operational costs and the environment. The criteria, methods and recommendation used in the audit were based on the identified risks.

3. Introduction

Green Audit is a systematic, documented, periodic and objective review by regulated entities of facility operations and practices related to meeting environmental requirements (EPA, 2003). In other words, it is a management tool comprising of systematic, documented, periodic and objective evaluation of the organization, which management and equipment are performing with the aim of helping to safeguard the environment by facilitating management control of practices and assessing compliance with company policies which would include regulatory requirements and standards applicable (international Chamber of Commerce, 1989).

Green auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of audits. Organizations of all kinds now recognize the importance of environmental matters and accept that their environmental performance will be scrutinized by a wide range of interested parties.

4. Utility of Green Audit

These are used to help improve existing human activities, with the aim of reducing the adverse effects of these activities on the environment. An environmental auditor will study an organization's environmental effects in a systematic and documented manner and will produce a green audit report.

5. Objectives of the Study

The main objectives of the green audit are to promote environmental management and conservation in the institute campus. The purpose of the audit is to identify, quantify, describe and prioritize the framework of environmental stainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out green audit are-

- To introduce and make aware students of real concerns of the environment and its sustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on thecampus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires highcost.
- To bring out a present status report on environmental compliance.

6. Methodology

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

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

7. WATER SAVING POTENTIAL & BEST MANAGEMENT PRACTICES

Best management practices (BMPs) are a set of hands-on recommendations that help to identify opportunities and implement programs to save water in college. BMPs are developed for the various water-use categories in the office buildings and for monitoring and operational procedures. They are grouped according to indoor water use, outdoor water use, and monitoring and operational procedures. We can tailor water-saving program by using part or all the BMPs depending on budget and environmental requirements. Tips and information are provided on water-saving amounts and cost recovery to help in prioritizing measures and make the most knock for buck.

Based on the information collected and observations, the following can be recommended to reduce water use and increase its efficiency.

Faucets

Lavatory, bathing and hand wash facilities faucets average water use in the workshop buildings is approximately 28% of the total water received. In some of the faucets water run around 9 litre per minute. Faucets flows can easily be reduced without affecting the comfort of the water user by using appropriate flow regulator technology for these fixtures. This will result in impressive savings of around 50 percent of faucets water use. Flow regulators, especially the aerators are inexpensive and are easy to install and maintain. This is why they are often considered as the low hanging fruits of water saving programs.

Here are the recommended best management practices for achieving water savings for faucets at office building.

- Use pressure compensating and tamper proof aerators that can only be removed

with a 'special' tool to reduce vandalism and theft.

- Regularly clean faucets as sediments may accumulate and reduce the flow.

Recommend flow rate for different type of uses	
Public hand-washing faucet or self-closing faucet	≤ 4.5 litres /min ≤ 1.0 litres /cycle
Restroom faucet	≤ 4.5 litres /min
Kitchen faucet	≤ 8.3 litres/min

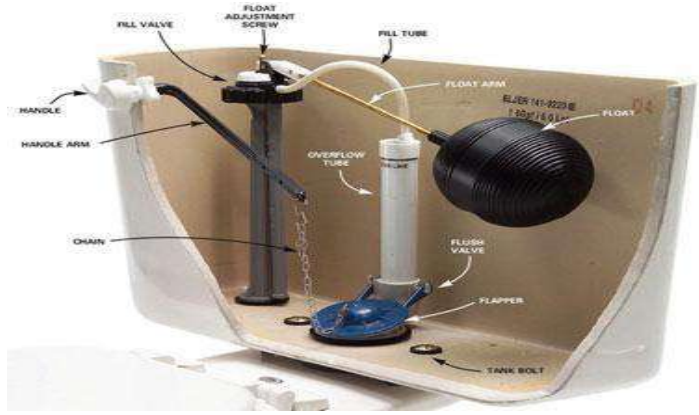
Flow per minutes could be set to 2 or 3 or…6 Litres or more as per the requirement. The Flow Control aerator generates thin streams (like shower aerator) of water to cover wider area for rinse, when compared to conventional aerators. This results in lesser-run time of faucet and easiness for user and ultimately water saving. Flow Control Aerator can easily be installed in existing faucets.

Urinals

Low water use urinals: In some of the standard systems, water is applied automatically through a continuous drip-feeding system or by automated flushing at a set frequency, 24x7, regardless of whether the urinal has been used. Water consumption varies with the system model at an average of 4 litres per flush. Water-efficient urinals use 2.8 litres per flush and in recent times smart flush systems using 0.8 litres per flush have also been launched.

Waterless urinals: There are various technologies available for waterless urinals. In oil barrier technology, the urinals operate using an oil wall between the urine and the atmosphere, preventing odor from escaping. In another technology, the barrier has been replaced by a seal with a collapsible silicone tube that closes after the fluid has passed through it, to prevent gases from flowing into room. A third system uses biological blocks which include microbial spores and surfactants which can be placed into any urinal, thus eliminating water use. By breaking down the urine into components, buildup of sludge and crystals which causes blockages is prevented. Bidets and urinals water use accounts for 3 percent of office buildings water use. These standards shown in the table offer a good water-saving opportunity for water saving in office buildings.

Toilets



A dual-flush toilet is a variation of the flush toilet that uses two buttons or handles to flush different levels of water. A significant way to save water in buildings is to replace single-flush toilets with dual flush toilets. The standard dual- flush toilets use six litres of water on full and three litres on a half-flush.

Replacing old toilets will result to a reduction of 35 percent of toilet water. More cost-effective results can be achieved by replacing only the toilet trim system.

TOILET TANK BANK

With economical, maintenance free 'Green Toilet Bank' it is very easy to save water on toilet flushing, it helps to save 3 liters water on every flushing, with no sacrifice on performance. Toilet Bank filled with water is hanged inside the toilet flushing tank or reservoir. It will displace an amount of water equivalent to 3 Liters in the tank, which means every flush we will save water, thus saving you money. Less the water you use, the less you need to recycle.

8. Saving Water through Monitoring and Operational Procedures

Identifying and Fixing Leaks

The hidden water leaks can cause loss of considerable water and energy without anyone being aware of it. A small leak can amount to large volumes of water loss. Leaks become larger with time, and they can lead to other equipment failure. Fix that leaky pipe, toilet, faucet, or roof top tank to save considerable amount of money and water. The establishment of a leak detection and repair program would be a most cost-effective way to save money and water in the workshop building. Following are some best practices to identify and fixing leaks.

The Management must be committed for providing the staff and resources needed to maintain plumbing fixtures and equipment on a regular basis and assuring prompt identification and repair of leaks.

- Repair staff is given the tools needed and is trained to make leak repair a priority activity.
- Staffs are taught to report leaks and other water-using equipment malfunctions promptly.
- Staffs are rewarded for success.
- Rooftop tank overflow or leakage water should flow to rainwater gutter system not to sewage system to allow detection of rooftop water loss.
- Records of the type, location, number, and repair of leaks are kept in a central location.

Water Metering and Sub-metering

The metering and sub-metering of Main incoming line is essential to understand the water consumption pattern inside the college and hospital building. The accurate measurements enable management to understand maximum and minimum consumption area in the College building and improve water efficiency in the college and hospital building. Monitoring of the water usage allows management to know where and when water is being used and where the best opportunities for water savings exist. Thus, it is recommended to install water meters on each consumption area in the building.

GENERAL RECOMMENDATIONS

Based on the physical inspection and document reviewed on water distribution system of Building, EFS recommends the following recommendations for using water efficiently at College & Hospital Building.

Water tank overflow Alarm system

It is noticed that no alarm as well as level sensor was provided to overhead water tanks. The water alarm system should be installed at all overhead Tank, All PVC rooftop Tanks to avoid over spillage of water. This will help in reduction of wastage of water as well as electricity.

Implementation of water accounting & management system

It was noticed during the audit that water flow meters are nowhere installed at College and Hospital Building. Therefore, it is highly recommended to install digital water flow meters on all the main lines. Digital water meters are also required to install in each section to monitor the section wise water consumption and planning for effective water management. It is also recommended to appoint internal Water Audit team who can inspect water distribution system and for the accounting of water usage in the hospital and college building.

Minimization of leakage water

Leakages were observed in Valves at Hospital and college building resulting in water loss. It is recommended to close out theses leakages by replacing faulty valves to avoid wastage of water. It is also recommended to regularly check for leakages and fix them on urgent basis.

Regular Maintenance of toilet system and use of water efficient fixtures

Regular maintenance of the toilets should be carried out. Test for leaks and make necessary repairs promptly. Keep the toilet in working order by periodically inspecting and replacing flappers and other defective parts. Water efficient fixtures such as aerator and water efficient taps need to be used to reduce water consumption.

Capacity building of Staff Involved in Water Distribution

The Management of Jaypee University of Information Technologymay arrange capacity building and awareness programs for the staff engaged in water distribution.

OVERALL AIM FOR WATER CONSERVATION: ON THE WAY FORWARD WITH THE 3-R CONCEPT

"Water conservation is defined as any action that reduces the amount of water withdrawn from

water supply sources, reduces consumptive use, reduces the loss or waste of water, improves the efficiency of water use, increases recycling and reuse of water, or prevents the pollution of water".

Reduce

Reduction at Source

- Better operating controls such as arresting leakages
- Installation of water saving devices such as water tank alarm at all overhead tanks
- Change of device/ equipment such as replacement of water pumps and motor with energy efficient pumps and motors
- Process modification such as use of sprinklers for watering plants and garden

Recycle & Reuse

- Use of treated water in toilets flushing, gardening, fountains, fire fighting equipment's
- Use of storm water as Cooling Tower make-up water after treatment.
- Using storm water & sanitary water as fire water after treatment.
- Reduction of Fresh Water usage supplemented through waste water treatment.
- Direct use of Rain Water Harvesting through storage tanks

Recharge

- Installation of recharge wells / rain water harvesting pits for recharging ground water tables.
- Total recharging capacity (during rain time) to be estimated in 3mm/hr.
- Rain Water Harvesting and conservation.

9. Water consumption (Asset) Management

List of water assets is detailed below.

S. N	Building Name	Floor Name	Hand Wash	W. C	Shower/Bath	Water cooler	Pantry/Kitchen	For Cleaning
1	Academic Block	LVL-2	7	7		1	1	1
		LVL-1	2	2				
		LVL 0	5	4		2		1
		LVL+1	10	12		1	1	1
		LVL+2	12	13		1		
		LVL+3	8	10		1		1
		LVL+4						
2	Civil Engg. Deptt.	Floor LVL+2	1	1				
		Floor LVL+1	1	1				
		Ground	1	1		1		
		LVL-1	1	1				
		LVL-2	1	1			1	
		LVL-3	1	1		1		
		LVL-4	1	1			1	
3	Laundry	ESS	4	2	2			
4	Hostel H-1	Floor 1,2,3,4,5,6,&7	19	13	13	1		
5	Hostel H-2	Floor 1,2,3,4,5,6,&7	19	13	13	1		
6	Hostel H-3	Floor 1,2,3,&4	8	8	8	1		
7	Hostel H-4	Floor 1,2,3,4,5,6,&7	18	13	13	1		
8	Hostel H-5	Floor 1,2,3,4,5, 6,7,8,9&10	24	16	16	1		
9	Hostel H-6	Floor 1,2,3,4& 5	10	10	10	1		
10	Hostel H-7	Floor 1,2,3,4,5,6,&7	19	12	12	1		
11	Hostel H-8	Floor 1,2,3,4,5,6	12	8	8	1		
12	Hostel H-9	Floor 1 & 2	6	4	4	1		
13	Hostel H-10	Floor 1 & 2	6	4	4	2		
14	Hostel H-11	Floor 1,2,3,4,5,6,7&8	15	11	11	1		
15	Hostel H-12A	Floor 1,2,3,4,5,6,7,8&9	25	17	17	1		
16	Hostel H-12B	Floor 1,2,3,4,5,6,&7	18	12	12	1		
17	Hostel H-12C	Floor 1,2,3,4,5,6,7,8&9	25	17	17	1		
18	Hostel H-12D	Floor 1,2,3,4,5,6,7&8	22	15	15	1		
19	Hostel H-14A	Floor 1,2,3,&4	7	7	7	1		
20	Hostel H-14B	Floor 1,2,3,4,5,6,&7	18	12	12	1		
21	Hostel H-14C	Floor 1,2,3,4,5,6,7,8,9&10	28	19	19	1		
22	Hostel H-14D	Floor 1,2,3,4,5,6,7,8&9	26	17	17	1		
23	Hostel H-15A	Floor 1,2,3,4,5,6,7,8,9&10	28	19	19	1		
24	Hostel H-15B	Floor 1,2,3,4,5,6,&7	19	13	13	1		
25	Hostel H-15C	Floor 1,2,3,4,5,6,7,8,9&10	28	19	19	1		
26	Hostel H-15D	Floor 1,2,3,4,5,6,7,8,9&10	28	19	19	1		

S. N	Building Name	Floor Name	Hand Wash	W. C	Shower/Bath	Water cooler	Pantry/Kitchen	For Cleaning
27	Dispensary	Staff	2	1	1	1	1	
		Boy Ward	1	1	1			
		Girl Ward	1	1	1			
		Medical Attendent Room	3	3	3	1	1	
28	Faculty Residance	E1 Type Tower 1 BHK(Flat no 7)	7	7	7	6	7	
29	Faculty Residance	E2 Type Tower 1 BHK(Flat no 8)	8	8	8	8	8	
30	Faculty Residance	E2 Type Tower 2 BHK(Flat no dormitory)	2	2	2		2	
31	Faculty Residance	D1 Type Tower 2BHK=8	16	16	16	8	8	8
		D1 Type Tower 1BHK=2	2	2	2		2	
32	Faculty Residance	D2 Type Tower 2BHK=8	16	16	16	8	8	8
		D2 Type Tower 1BHK=2	2	2	2		2	
33	Faculty Residance	C1 Tower 2 BHK=6	12	12	12	6	6	6
		C1 Tower 1 BHK=2 (Dormitory)	2	2	2		2	
34	Faculty Residance	C2 Tower 1 BHK=6	12	12	12	6	6	6
		C2 Tower 1 BHK=1 (Dormitory)	1	1	1		1	
35	Faculty Residance	C3 Tower 2 BHK=6	12	12	12	6	6	6
		C3 Tower 1 BHK=1 (Dormitory)	1	1	1		1	
36	Faculty Residance	B1 Tower 2 BHK=5	10	10	10	6	5	5
		B1 Tower 2 BHK=1	1	1	1		1	
		B1 Tower Dormitory=2	3	3	3	1		
37	Faculty Residance	B2 Tower 2BHK=6	12	12	12	6	6	6
		Club	1	1		1	1	
38	Faculty Residance	B3 Tower 2BHK=6	12	12	12	7	6	5
		B4 Tower 2BHK=5	10	10	10	5	5	
		B4 Tower 2BHK=1	1	1	1		1	
		B4 Dormitory=1	2	3	2	1		
39	Exchnage Block	LVL 0, 1BHK	2	2	2	2	2	
		LVL-1 Dormitory	4	3	3	1	1	
		LVL-2, 1BHK	2	2	2	2	2	
		LVL-3 Dormitory	3	3	3		1	
		LVL-4 Dormitory	2	2	2			
40	Guest House(Vasant Bhawan)	VIP Rooms=14	14	14	14	1	1	
		Extra Toilet	2	2	2			
		SOR Dormitory	2	2	2			
		Driver Room	1	1	1			

S. N	Building Name	Floor Name	Hand Wash	W. C	Shower/Bath	Water cooler	Pantry/Kitchen	For Cleaning
41	Faculty Residance	A Type Faculty 03 BHK=05 nos	15	15	15	1	5	5
		A Type Faculty 02 BHK=01 nos	2	2	2	1	1	1
		A Type Faculty 02 BHK=01 nos	1	1	1	1	1	1
42	FH-2 Guest House	Rooms=10 Nos	10	10	10	1		
	FH-3 Guest House	Rooms=8 Nos	8	5	5	1		
	Dormitory LVL+1	Rooms=8 Nos	8	6	6	1		
	Dormitory LVL 0	Rooms=8 Nos	8	6	6	1		
43	Annapurna	LVL 0	22	4		4	1	1
		LVL-1	6	2			1	1
44	Annapurna	FH-2	5				1	1
45	F Block	Ground LVL	4	4	4	4		
		LVL+1	4	4	4	4		
		LVL+2	4	4	4	4		
		LVL-1	2	2	2	2		
		LVL-2	1	1	1	1		
46	Security Post	Main Gate	1	1			1	
47	Main Store		1	1			1	
	TOTAL		769	606	538	538	110	64

10. Electricity consumption (in Units) and management

MONTH	'KWH CONSUMPTION	KVAH CONSUMPTION	FIXED CHARGE	ENERGY CHARGES (INR)	PF	CONTRACT DEMAND (KVA)	MAX DEMAND (KVA)	BILLING DEMAND (KVA)	NET AMOUNT PAYABLE (INR)
May-21	108375	109970	156870	516624	0.99	1245	316	1121	689543
Jun-21	106930	107210	156870	503887	1.00	1245	227	1121	676424
Jul-21	101440	101665	156870	477826	1.00	1245	234	1121	601331
Aug-21	107970	108305	156870	509034	1.00	1245	226	1121	681725
Sep-21	114530	114760	156870	539372	1.00	1245	272	1121	712973
Oct-21	123680	124140	156870	583458	1.00	1245	394	1121	758382
Nov-21	196840	197435	156870	927945	1.00	1245	496	1121	1113202
Dec-21	239320	240050	156870	1128235	1.00	1245	604	1121	1319502
Jan-22	323920	326945	156870	1536642	0.99	1245	679	1121	1740161
Feb-22	208665	208885	156870	981760	1.00	1245	538	1121	1168632
Mar-22	218620	218635	156870	1027585	1.00	1245	647	1121	1215832
Apr-22	284445	284445	156870	1336892	1.00	1245	644	1121	1534379

11. Sound Pollution Monitoring

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

Sr.No	Location	Sound DB	
		Min	Max
1	THANK YOU GATE	48	54
2	COLLEGE MAIN GATE	52	54
3	PARKING AREA	48	52
GROUND FLOOR			
4	AMPHITHEATER(AUDITORIUM)	47	53
5	RECEPTION	49	51
6	ADMINSTRATION OFFICE	46	52
7	REGISTRAR OFFICE	45	50
8	MEETING ROOM	45	52
9	HR OFFICE	50	54
10	LEARNING RESOURCE CENTRE(LRC)	47	52
11	COMPUTER LABS CL-7, CL-8	52	55
12	CLASS ROOMS CR-3, CR-4	49	52
13	LECTURE THEATERS LT-1, LT-2	46	48
FIRST FLOOR			
14	COMPUTER LABS CL-9, CL-10, CL-11	52	54
15	TUTORIAL ROOMS TR-1, TR-2, TR-3,TR4	48	55
16	FACULTY (HSS, IT, CSE)	49	54
17	CLASS ROOMS CR-5, CR-6, CR-7, CR-8, CR-9, CR-10	48	51
18	LECTURE THEATERS LT-3	50	53
19	PANTRY	49	52

Sr.No	Location	Sound DB	
		Min	Max
20	BOARD ROOM	47	55
21	ECE LAB-6	49	54
22	PHYSICS LAB-1	45	50
SECOND FLOOR			
23	GENOMIC TECHNOLOGIES LAB	49	52
24	CLASS ROOMS CR-11, CR-12	46	52
25	DIRECTOR'S &DEAN (A&R) OFFICE	52	54
26	COMPUTER LAB CL-1	48	55
27	U.G. BIOTECH LAB-4	49	52
28	TUTORIAL ROOMS TR-5, TR-6,TR-7	47	55
29	FACULTY (ECE, BT&BI, PMS,MATH,HSS)	49	54
30	VICE CHANCELLOR'SOFFICE	45	50
31	PRO CHANCELLOR'S OFFICE	48	55
32	BIOINFORMATICS LAB	52	54
33	ECE LABS-3,4,5	48	55
34	CHARACTERIZATION LAB	47	55
THIRD FLOOR			
35	EM. ANALYSIS LAB	45	50
36	PROBIOTICS AND GUT SIMULATION LAB	47	53
37	PHYSICS LAB-2	52	54
38	PG. BIOTECH LAB	48	55
39	RESEARCH LAB ECE, CSE, BI, e-YANTRA, IOT	46	52
40	SERVER ROOMS	45	50
41	LANGUAGE LAB	45	52
42	C.V.D.LAB	50	54
43	U.G.BIOTECH LAB-3	47	52
44	FACULTY (BT&BI)	52	55
45	ECE LABS-1, 2, 7	47	55
46	P.G.LAB	46	48
47	COMPUTER LABS CL-3, CL-4, CL-5, CL-6, CL-12	49	52
48	MATERIAL SCIENCE LAB	47	55
49	GROUP DISCUSSION ROOM	49	54
FOURTH FLOOR			
50	BIOTECH LABS	46	52
51	CLASS ROOMS 16, 17, 18, 19	52	54
LOWER LEVEL-1			
52	ACCOUNT & FINANCE	48	55
53	CLASS ROOMS CR-1, CR-2	47	55
54	CONTROLLER OF EXAMINATION	49	54
LOWER LEVEL -2			
55	WATER FILTER ROOM	52	54

Sr.No	Location	Sound DB	
		Min	Max
56	RECORD ROOM	48	55
57	TELEPHONE EXCHANGE	47	55
58	TUCK SHOP	49	54
LOWER LEVEL-3			
59	IPR CELL	50	54
60	TIED CELL	47	52
61	PANJAB NATIONAL BANK	52	55

Recommended sound level as set in CPCB-Environmental Standards-Noise (ambient standards) dB (A)

SCHEDULE

(see rule 3(1) and 4(1))

Ambient Air Quality Standards in respect of Noise

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

Note:- 1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

12. Air Quality Monitoring

Since air quality plays a vital role for good health. Air Quality monitoring instrument is used to monitor quarterly the criteria pollutants. The most important air quality parameters, which are measured, are Humidity, PM 2.5 & PM10. The other criteria pollutants such as Ozone, Carbon Monoxide, NO2, SO2 and Lead are not measured because there are no nearby Industries located near the institute, which are emitting these pollutants. Noise equally plays a vital role in the environment; hence noise measurement is also done at the institute quarterly.

Respirable Dust Sampler

13. Waste Disposal

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

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

Waste management practices are not uniform among countries (developed and developing nations) regions (urban and rural areas), and residential and industrial sectors can all take different approaches.

A large portion of waste management practices deal with municipal solid waste which is the bulk of the waste that is created by household, industrial, and commercial activity.

Jaypee University of Information Technology has employed waste bins for proper segregation of solid wastes in the campus.

Number of dustbins listed below:

Details of dustbin & approx. waste disposal

1. No of dustbin: - 400 approx.
2. Waste disposal quantity 24,000 KG approx. per month

14. List of Trees in Campus

Total 3702 trees in campus. As listed below.

Sr. No.	PLANT NAME	LOCATION																
		1 Bed Room	M.P. Theater	Road side	S.O. R	Temple	Dhayankash	H-12	H-12 &H14	H-14 & h-15	S.O.R Slop	Mughal Garden	F.H-2 &S.T. P	C/ Faculty	B/Faculty	D/Faculty	H-2 Slop	Boundary Side
1	Silver ok	49	68	68	12		25	165	70	183	47	68	95	136	86	146	135	70
2	Tone	11	6	7			3	1	2	2	8		7			18	10	10
3	Kachhar	8	17	12			7		18	24	35		27			15	15	17
4	Bottal Brosh	18	30	65	7		15	8	28	38	48	5	35		5	25	28	20
5	Amal Tas	11	18	6					3	4	11		10			37	12	5
6	Arjun	7	13	4			4	1	5	2	8		13	5	3	18	5	25
7	Pilkhan	5	3	15		1	3		9	6	47		17	10	10	45	12	18
8	Jakrinda	18	20	42					16	41	22		32			28	38	20
9	Guler	25	22	26			20		28	27	19		25	15	8	22	20	17
10	Arrowerea	1	12		33		2						5	6				
11	Benjamin	7	3	13	2		39	2		3	5	3	24	10	5	5		
12	Khureiga	6	136	25	4	2	16	30	17		22		25	12	3	18	10	21
13	Thuja	1	8															
14	Pipal	1				2												
15	Chinar	1			1	1												
16	Rubber Plant			1														
17	Magnolia				3													
18	Rine		34		25	2						25						
19	Pam		4				1											
20	Champa		5															

15. Biodiversity status of the college campus

Introduction

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

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

Objectives

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

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

Method of Study

A brief methodology for the floral and faunal survey is given below.

1.Sampling was done mostly in a random manner.

2. The total area was surveyed by walking at the daytime.
3. Surveys were conducted for the maximum possible hours in the daytime.
4. Tree species were documented through physical verification on foot.
5. For faunal species, we emphasized mainly on the direct sighting. Also call of various birds and amphibians and nesting of some faunal species were considered as direct evidences.

6. Observing mammals depend critically on the size of the species and its natural history. Diurnal species are common and highly visible. Nocturnal species, however, are rare and difficult to detect. Small mammals like the field rats were found near their burrows, particularly during their entry or exit times in or out from their burrows respectively. In some cases, dung deposits and footprints were also observed that served as a potential clue for the presence and absence of the concerned species. These secondary evidences were all noted with time and spaceco-ordinates.
7. Birds are often brightly colored, highly vocal at certain times of the year and relatively easy to see. Sampling was done on the basis of direct sighting, call determination and from the nests of some bird species.
8. Reptiles were found mostly by looking in potential shelter sites like the under surface of rocks, logs, tree hollow sand leaf litter and also among and under neath the hedges. Sometimes some species, particularly the garden lizards were also observed in open spaces (on twigs and branches and even on brick constructions) while they were basking under direct and brightsunlight.
9. Amphibians act as potential ecological indicators. However, most of them are highly secretive in their habits and may spend the greater part of their lives underground or otherwise inaccessible to biologists. These animals do venture out but typically only at night. They were searched near pond, road beside wetland and in other possible areas. Diurnal search operations are also *success*ful.
10. Active invertebrates like the insects require more active search. For larger winged insects like butterflies, random samplings were carried and point sampling was alsodone.
11. The easiest way to observe many of the invertebrates is simply looking for them in the suitable habitat or micro-habitat. Searching was carried out under stones, logs, bark, in crevices in the walls and rocks and also in leaf litter, dung etc. Slugs and snails are more conspicuous during wet weather and especially at night when they were found using a torch.

Faunal Species

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

Table 01: Checklist of Faunal groups with species number

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

Table 02: Checklist of Birds

No.	Common Name	Scientific Name	Family
1	Common HawkCuckoo	Hierococcyx varlus	Cuculidae
2	Common Hoopoe	Upupa epops	Upupidae
3	Common Iora	Aegithrna tipsia	Aegithinidae
4	Common Kingfisher	Alcedo atthis	Alcedinidae
5	Common Myna	Acridotheres tristis	Sturnidea
6	Common Pigeon	CoInmba livia	Columbidae
7	Common Sandpiper	Actitis hypoleucos	Scolopacidae
8	Common Tailorbird	Orthotomus sutortus	Cisticolidae
9	Coppersmith Barbet	Megalaima haemacephala	Ramphastidae
10	House Crow	Corvus splendens	Corvidae
11	House Sparrow	Passer domesticus	Passeridae
12	Indian Cormorant	Pholocrocorax fuscicollis	Phalacrocoracidae
13	Pale-billed Elowerpecker	Dicoeum erythrorynchos	Dicaeidae
14	Taiga flycatcher	Ficedula albicilla	Muscicapidae
15	Yellow-footed Green Pigeon	Treron phoen icoptera	Columbibae

Table 03: Checklist of Reptiles

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

Table 04: Checklist of Amphibians

No.	Common Name	Scientific Name	Family
1	Indian Toad	Duttaphrynus melanostictus	Bufonidae
2	Frog	Enphldctis cyanophlyctis	Dicroglossidae

Table 05: Checklist of Butterflies

No.	Common Name	Scientific Name	Family
1	Blue Mormon	Papilio polymnestor	Papilionidae
2	Common Jay	Graphium doson	Papilionidae
3	Common Mime	Papilo clytia	Papilionidae
4	Common Mormon	Papilo polytes	Papilionidae
5	Common Rose	Pachliopta aristolochiae	Papilionidae
6	Lime Butterfly	Papitto demolis	Papilionidae
7	Tailed Jay	Graphium agamemnon	Papilionidae
8	Small Grass Yellow	Furema brigitta	Pieridae
9	Common Grass Yellow	Eurema hecabe	Pieridae
10	Common Gull	Cepora nerissa	Pieridae
11	Indian Jezebel	Delias eucharis	Pieridae
12	Indian Wanderer	Pareronia hippia	Pieridae
13	Lemon Emmigrant	Catopsila Pomona	Pieridae
14	Mottled Eemigrant	Catopsilia pyranthe	Pieridae
15	Psyche	Leptosia nina	Pieridae
16	Common Cerulean	Jamides celeno	Lycaenidae
17	Common Lineblue	Prosotosnora	Lycaenidae
18	Tailless Lineblue	Prosotas dubiosa	Lycaenidae
19	Common Pierrot	Castalius rosimon	Lycaenidae
20	Common Quaker	Neopithecops zalmora	Lycaenidae
21	Dark Grass Blue	Zizeeria karsandra	Lycaenidae
22	Forget-me-not	Catochrysops strabo	Lycaenidae

Floral species:

Number of Floral species observed: 125

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

Table 06: Checklist of Floral groups with species number

1	Trees	14	Table 7
2	Grasses	2	Table 8
3	Herbs	36	Table 9
4	Shrubs	28	Table 10
5	Creepers	24	Table-11
6	Ornamental Plants	1	Table 12
7	Palms	7	Table 13
8	Fern & Season flower	13	Table-14

Table 7: Checklist of Trees

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

Table 8: Checklist of Grasses

No.	Common Name	Scientific Name	Family
1	Common Carpetgrass	Axo nopus sp.	Poaceae
2	Durba	Cynodon dcatyl on	Graminae

Table 9: Checklist of Herbs

No.	Common Name	Scientific Name	Family
1	Curry tree	Murraya koenigii	Rutaceae
2	White cedar	Thuja occidentali	Cupressaceae
3	Banyan tree	Ficus benghalensis	Moraceae
4	Yellow oleander	Cascabela thevetia	Apocynaceae
5	Aloe vera	Aloe vera	Asphodelaceae
6	Barberry	Berberis vulgaris L	Berberidaceae
7	Lemon	Citrus Limonum	Rutaceae
8	China rose	Hibiscus rosa-sinensis	Malvaceae
9	Neem	Azardirchata - indica	Mahaceae
10	Tulsi	Ocimum sanctum	Lamiaccac
11	Toon	Toona sinensis	Meliaceae
12	Ashok	Saraca Asoca	Caesalpinanceac
13	Amla	Emblica officinalis	Euphorbiaceac
14	Henna/mehndi	Lawsennia iermis	lytharaceae
15	Marigold	Tagetes erecta	Asteraceae
16	Tej Patta	Cinnamomum tamala	Lauraceae
17	Arjun	Terminalia arjuna	Combretaceae
18	Aswagandha	Withania Somnifera	Solanaceae
19	Jamun	Syzygium cumini	Myrtaceae
20	Candyleaf	Stevia rebaudiana	Asteraceae
21	Tamarind (Imli)	Tamarindus indica	Fabaceae
22	Drumstick-Tree	Moringa oleifera	Moringaceae
23	Kachnar	Bauhinia variegata	Fabaceae
24	Lemon grass	Cymbopogon citratus	Poaceae
25	Safed aak	Calotropis Gigantea	Apocynaceae
26	Datura (Yellow)	Datura stramonium	Solanaceae

27	Datura (Black)	Datura stramonium	Solanaceae
28	Red oleander	Cascabela thevetia	Apocynaceae
29	Sudarshana	Crinum latifolium	Amaryllidaceae
30	Kapur	Cinnamomum camphora	Lauraceae
31	Babri	Eclipta prostrata	Asteraceae
32	Common guava	Psidium guajava	Myrtaceae
33	Rose	Rosa rubiginosa	Rosaceae
34	Bakaian	Melia azedarach	Mahogany
35	Rangoon creeper	Quisqualis indica	Combrataceae
36	Bael (Wood apple)	Aegle marmelos	Rutaceae

Table 10: Checklist of Shrubs

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

27	Oleander	Nerium oleander	Apocynaceae
28	Karipata	Murraya Koenigii	Rutaceae

Table 11: Checklist of Creepers

No.	Common Name	Scientific Name	Family
1	Aparajita	Clitoria ternatea	Fabaceae
2	Birdfoot Grape-Vine	Cayratia pedata	Vitaceae
3	Passion Flower	Passiftora suberosa	Passifloraceae
4	Cayratia	Coratia trifolia	Vitaceae
5	Corkystem Passionflower	Passiflora suberosa	Passiflozaceae
6	Birdfoot Grape-Vine	Cayratia sp.	Vitaceae
7	Gulanchalata	Tinospora cordifolia	Menispermaceae
8	Titakunja	Wattakaka votubillis	Asclepiaceae
9	Bengal Trumpet Vine	Thunbergia grandiflora	Acanthaceae
10	Lpomoea	lpomoea aquatic	Convolvulaceae
11	I ndian Stinging Nettle	Tragia in volucrato	Euphorbiaceae
12	Money Plant, Ivy Arum	Epipremn um aureum	Areceae
13	Snake Vine	Stephania japonica	Menispermaceae
14	Philodendron	Philodendron sp.	Areceae
15	Chinese creeper	Micania micrantha	Asteraceae
16	White Morning Glory	lpomoea obscura	Convolvulaceae
17	Telakuchu	Coccinia grand is	Cucurbitaceae
18	Tiliacora	Tiliacora racemosa	Menispermaceae
19	Roundleaf Bindweed	Evolvulus Nummularius	Convolvulaceae
20	Justicia	Justicia simplex	Acanthaceae
21	Hemigraphis	Hemigraphis hirta	Acanthaceae
22	Climbing Mallotus	Nlallotus repandus	Euphorbiaceae
23	Bougainvillea	Bougainviflea sp.	Nyc‹aginaceae
24	Allamanda	Allamanda sp.	Apocynaceae

Table 12: Checklist of Ornamental Plant

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

Table 13: Checklist of Palms

No.	Common Name	Scientific Name	Family
1	Areca Palm	Dypsis Intescens	Arecaceae
2	Bottle Palm	Hyoyhorbe lagenicaulis	Arecaceae
3	Indian Datepalm	Phoenix sylvestris	Palmae
4	Coconut	Cocos nucifera	Arecaaceae
5	Palmyra Palm	Borassusflabe Hifer	Palmae
6	Areca	Areca catechu	Arecaceae
7	Palmyra Palm	Borassusflabellifer	Arecaceae

Table 14: Checklist of Ferns and Seasonal Flowers

No.	Common Name	Scientific Name	Family	Type
1	Bircl- nest Fern	Asplenium Sp.	Aspleniaceae	Fern
2	Fishtail Fern	Microsorum punctatum	Polypodiaceae	Fern
3	Oakleaf Ferm	Drynoriaquercifolia	Polyqodiaceae	Fern
4	Snapdragon	Antirrhinum majus	Scrophulariaceae	Season
5	Garden stock	Matthiola incana	Brassicaceae	Season
6	Gazania	Gazania sp.	Asteraceae	Season
7	Gladiolus	Gladiolus sp.	Iridaceae	Season
8	Flaming Kaaty	Kalanchoeblossfeldiana	Crassulaceae	Season
9	Miaden Pink	Dianthus deltoids	Carryophyllaceae	Season
10	Amaryllis	Hippeastrum Sp	Amaryllideceae	Season
11	Pansy	Viola tricolor var.	Violaceae	Season
12	Petunin	Petunia hybrida	Solanaceae	Season
13	Verbena	Vei-hena sp.	Verbenaceae	Season

Conclusion:

Biodiversity status of college campus found satisfactory.

16. Suggestions and Recommendations

- Sustainable use of resource and ecology balance of the college campus must be maintained through the year.
- The prolific use of insecticides/pesticides should be checked as these harmful chemicals are detrimental and instrumental for killing of insects/butterflies which are natural prey for the birds.
- There is urgent need to form a Green Monitoring Team.The priority ofthis body is to maintain the greenry of the College campuses.
- The Green Monitoring Team should consist of members from teaching staffs, non teaching staffs, students and if possible try to include some local interested people.
- Vermicompost facility may be practiced, the product of which can be used as manure or fertilizer for plantation purpose.

Drinking Water Quality Standard as per Bureau of Indian Standards IS 10500

SN	Substance Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permisible Limit in the Absence of Alternate Source	Method of Test (Ref. to IS)	Remarks
1	2	3	4	5	6	7
Essential Characteristics						
i	Colour, Hazen units, Max.	5	Above 5. consumer acceptance desreases	25	3025(Part-4): 1983	Extended to 25 only if toxic substances are not suspected in absenceof alternate sources.
ii	Odour	Unobjectionable	-	-	3025 (Part-5): 1983	a) Test cold and when heated b) Test at several dilutions
iii	Taste	Aggreable	-	-	3025 (Part 7&8):1984	Test to be conducted only after safety has been established.
iv	Turbidity NTU, Max.	5	Above5, consumer acceptance decreases.	10	3025 (Part 10): 1984	
v	pH Value	6.5 to 8.5	Beyond this range the water will affect the mucous membrane and/or water supply system	No relaxation	3025 (Part 11): 1984	

SN	Substance Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permisible Limit in the Absence of Alternate Source	Method of Test (Ref. to IS)	Remarks
1	2	3	4	5	6	7
vi	Total Hardness (as CaCO3) mg/l, Max.	300	Encrustation in water supply structure and adverse effects on domestic use.	600	3025 (Part 21): 1983	
vii	Iron (as Fe) mg/l, Max.	0.3	Beyond this limit taste/ appearance are affected , has adverse effect on domestic uses and water supply structures, and promotes iron bacteria.	1.0	32 of 3025 : 1964	
viii	Chloride (as Cl) mg/l, Max.0.3	250	Beyond this limit, test, corrosion and palatability are affected.	1000	3025 (Part 32): 1988	
ix	Residual free chlorine mg/l, Min	0.2	-	-	3025 (Part 26)1986	To be applicable only when water is chlorinated. Tested at consumer end. When protection is required, it should be Min 0.5mg/l

S N	Substance Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permisible Limit in the Absence of Alternate Source	Method of Test (Ref. to IS)	Remarks
1	2	3	4	5	6	7
x	Fluoride (as F) mg/l, Max.	1.0	Fluoride may be kept as low as possible. High fluoride may cause fluorosis	1.5	23 of 3025 1964	
	Desirable Characteristics					
xi	Dissolved solid mg/l, Max.	500	Beyond this palatability decreases and may cause gastro intestinal irritation	2000	3025 (Part 16) 1984	
xii	Calcium (as Ca) mg/l, Max.	75	Encrustation in water supply structure and adverse effect on domestic use	200	3025 (Part 40) 1991	
xiii	Magnesium (as Mg) mg/l, Max.	30	Encrustation to water supply structure and adverse effect on	100	16.33.34 of IS 3025 1964	
xiv	Copper (as Cu) mg/l, Max.	0.05	domestic use Astringent taste, will be caused beyond this discoloration and corrosion of pipes, fitting and utensils	1.5	36 of 3025 1964	

S N	Substance Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permisible Limit in the Absence of Alternate Source	Method of Test (Ref. to IS)	Remarks
1	2	3	4	5	6	7
xv	Sulphate (as SO4)	200	Beyond this causes gastro intenstinal irritation when magnesium or sodium are present.	400 (sec. col. 7)	3025 (Part 24) 1986	May be extended up 400 provided Magnesium (as Mg) does not exceed 30
xvi	Nitrate (as NO_2) Mg/l, Max.	45	Beyond this methaemoglobinemia takes place	No relaxation	3025 (Part 34) 1988	
xvii	Cadmium (as Cd) Mg/l, Max.	0.01	Beyond this, the water becomes toxic	No relaxation	See Note 1	To be tested when pollution is suspected
xviii	Arsenic (as As) Mg/l, Max.	0.01	Beyond this, the water becomes toxic	No relaxation	3025 (Part 37) 1988	To be tested when pollution is suspected
xix	Lead (as Pb) Mg/l, Max.	0.05	Beyond this limit, the water becomes toxic	No relaxation	See Note 1	To be tested when pollution is suspected
xx	Zinc (as Zn) Mg/l, Max.	5	Beyond this limit it can cause astringent taste & an opalescence in water	15	39 of 3925 1964	To be tested when pollution is suspected
xxi	Mineral Oil Mg/l, Max.	0.01	Beyond this limit undesirable taste and odour after chlorination take place	0.03	Gas chromatographic method	To be tested when pollution is suspected

Source: Indian Railways Institute of Civil Engineering, Pune

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THANKS