BUREAU VERITAS INDIA PVT LTD
File No. IND.B.7.23.21H R1

Environment Audit Report 2022-23
for
Presidency University, Bengaluru

Itgalpur, Rajanakunte, Yelahanka, Bengaluru 560064

BUREAU VERITAS
Shaping a World of Trust

Head Office	Regional Office
72 Business Park, 8th floor Marol Industrial Area, Opposite Seepz Gate No. 2, MIDC Cross Road "C", Andheri - (East) Mumbai - 400 093.	3rd floor Artisane Green Space No. 165 / 5, Krishnaraju Layout Dorsanipalya, Bengaluru 560076
www.bureauveritas.com	

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Environment Audit Report

PRESIDENCY UNIVERSITY

Itgalpur, Rajanakunte, Yelahanka, Bengaluru 560064

3rd May 2023

5th May'2023

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

THE ENVIRONMENT AUDIT DOCUMENT VERIFICATION TEAM

External Audit Team		
Sr. No.	**Name**	**Position**
1	Mr. Sanjay Singh	BEE, Certified Energy Auditor
2	Mr. RambabuRaghuvanshi	BEE, Certified Energy Auditor
3	Mr. Harshal Mahajan	Energy Consultant

Sanjay Singh BEE, Certified Energy Auditor EA-29059	Rambabu Raghuvanshi BEE, Certified Energy Auditor, EA-1462	IND.B.7.2023.21H-R1/Environment Audit Report /Final V1R0	26th May 2023
Audited & prepared by:	Validated by:	Revision Status	Date

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

ACKNOWLEDGEMENT

We are thankful to the Management of Presidency University, Bangalore and the officials located at Itgalpur, Rajanakunte, Yelahanka, Bengaluru 560064 for their kind co-operation during the Environment audit and appreciate the courtesy and cordiality extended to the Bureau Veritas auditors.

-Bureau Veritas (India) Pvt. Limited.

Disclaimer:

This report includes the findings of assessment carried out at Presidency University Itgalpur, Rajanakunte, Yelahanka, Bengaluru 560064 from 3rd May to 5th May 2023 for Environment audit. This report is issued within the scope of contract, documents submitted and does not perpetuate into compliance to any statutory regulations and / or codes of any country/region. The discussion of facts, as determined by the investigator, and the views expressed in the report do not assume and are not intended to establish the existence of any duty at law on the part of Presidency University, their employees or agents, contractors or any other party. This report neither determines nor implies liability. All the information provided in this report is based on the condition of site as on the date of audit/inspection and the information and access provided to the auditor. This report neither determines nor implies liability. All the information provided in this report is based on the condition of site as on the date of audit/inspection and the information provided to the auditor. This report is only a third-party observation and is not a certificate of safety nor an assurance to any party regarding the future condition of the site. Under no circumstances shall Bureau Veritas India Pvt Ltd, it's employees or the auditor shall be in any way responsible or liable for any accidents, incidents, damage to life, property or any other legal issue arising out of the site mentioned in this report directly or indirectly

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

ENIRONMENT AUDIT
Certificate

This is to certify that Presidency University, Bangalore has conducted, Environment Audit in the academic year 2022 - 2023 to assess the environmental initiative planning, efforts, activities, implemented in the college campus like Plantation, Rainwater Harvesting, Plastic ban, Conservation of Energy, Energy Management and various Environmental Awareness activities. Bureau Veritas (India) has verified campus data of, Presidency University, Bangalore.

MR. SANJAY SINGH

A P: Indian Green Building Council Green Building Consultant
EA 1462 Bureau of Energy efficiency
Ministry of Power Govt. of India

Save Energy save Nation

REGISTRAR

List of Contents

CHAPTER-01 9

INTRODUCTION 9

1.1 Introduction of University 9
1.2 Introduction of Environment Audit 10
1.3 Clean environmental Steps Taken by University 10
1.3 Objective Of the Environment Audit 11
1.4 Pre-Audit Stage 12
1.5 Management's Commitment 12
1.6 Methodology 12
1.7 Duration of the Environment Audit 13

CHAPTER-02 14

GENERAL OVERVIEW OF THE CONCEPT OF LAND USE 14

2.1 Site Overview of the Land use 14
2.2 Methodology Adopted for Land Use Mapping 15
2.3 Data Processing and Analysis 15
2.4 Geographical Location with Campus Map is Scale 15
2.5 PU Campus Building 17

THE RATIO OF OPEN SPACE AREA TO TOTAL AREA 18

CHAPTER-03 20

Waste Audit and Recycling Program 20

CHAPTER-04 26

WATER AUDIT WATER MANAGEMENT 26

4.1 Details Water Management 26
4.2 Water Audit Observation 27
4.3 Details of fully automated irrigation system at Water Audit Observation 32
4.4 Details of water recharging system at PU 34

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

4.5 **Sewage Disposal STP** 35
4.6 Key Finding 37
4.7 Recommendation 38

CHAPTER-05 41

ENVIRONMENTAL INITIATIVE & RECOMMENDATION 41

5.1 Environment Audit observation 41
- **Roof Top Solar Photovoltaic** 44

5.2 Use of Electrical vehicle in the campus 45
Program to Limit or Decrease Parking Area on Campus for the Last 3 Years (2018 to 2020) 45
5.3 Use of water fountain in the campus 46
5.4 Use of Landscape in the campus building 48

List of Table

Table 1: Executive Summary Presidency University 9
Table 1: Area Description Campus 18
Table 2: Open space Area Description 18
Table 2: borewell and tank Description 26
Table 2: Bore well details- water pumped 29
Table 2: Various Pump details for water pumped 30
Table 2: Reported water usage and related data 32

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

List of Figure

Figure 2:Presidency University, Bangalore Satellite View 14
Figure 3: Presidency University, Banglore 16
Figure 4: Total Campus Building 17
Figure 5: TOTAL AREA ON CAMPUS COVERED IN PLANTED VEGETATION 19
Figure 14: Recycling Program for University Waste 21
Figure 15: Program to reduce the use of Paper and Plastic on campus 22
Figure 16: Organic Waste Treatment 23
Figure 17: Inorganic Waste Treatment 23
Figure 18: Sewage Treatment Plant 25
Figure 18: Sewage Treatment Plant 37
Figure 34: Details Analysis Of Water Audit Trap 38
Figure 35 Rain Water Harvesting System 40
Figure 17: Program to limit Parking Area at Presidency 46
Figure 17: Installation of water fountain at PU 47
Figure 17: Indoor plants for maintaining the oxygen level at Presidency 48
Figure 23: Environmental Cell of Presidency University (ECPU) in Collaboration with NSS club 51

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

CHAPTER-01

INTRODUCTION

1.1 Introduction of University

Presidency University, Bangalore is a private university located in Itgalpur, Rajanakunte, Yelahanka, Bengaluru 560064 (10 kms from Yelahanka Town) 13.1682°N 77.5354°E. The University established in 2013 and commenced classes in 2015.The University is recognized by the University Grants Commission (UGC).

Table 1: Executive Summary Presidency University

1	Name of Consumer:	Presidency University- Bangalore
2	Name of the contact person	Dr. Badri H S – Deputy Director
3	Address of the consumer	AH Memorial Education TrustNo 21/1, Dibbur Village, Hessaraghatta Hobli Bangalore North Taluk, Karnataka -560084
4	Transformer capacity	1300 kVA
5	Capacity of back generators	1500 kVA
6	Contract Demand	400 kVA
7	Demand Charges	₹265/KVA for 85% Of contract demand
8	Roof top solar power plant	230 KW
9	solar power plant generation	125610 Units
10	Annual Energy consumption	945960 Units
11	Annual Amount paid toBESCOM	₹ 9517355/-
12	Type of connection	1HT2C2
13	Period of Audit	April -22 to March -23
14	Type of institute	Unaided – Private
15	Type of program	Engineering, Law, Management

16	Departments/faculty that comeunder the institute	Civil, Chemistry, Computer Science, English, Electrical&Electronics, Electronics &Communication, Learning &Development, Law, Kannada, Management, Mathematics, Mechanical, Physics, Petroleum, Design, Commerce and Economics
17	Total area of the institute	64 Acres

1.2 Introduction of Environment Audit

Presidency University green audit focused on obtaining data on environmental parameters likegreen cover, land use and land cover (LULC), water availability and usage, waste generation and their management practices, recording of energy consumption and conservation strategies,etc. The members of the audit team recorded the different facilities at the Presidency Universitycampus, determined different types of appliances and utilities (Water cooler, taps, toilets, lights, fan, ACs etc.) as well as measured the usage per item (Watts indicated on the appliance) and identified the relevant consumption patterns (such as how often an appliance is being used)and their impacts. The staffs, students and other stakeholders were interviewed through structured questionnaires to get details of usage, frequency, or general characteristics of different appliances. Data collection was done by onsite visit and also through questionnaires in different sectors such as water, energy, waste, biodiversity status. The data obtained were collated and analyzed to prepare this audit report of Presidency University.

1.3 Clean environmental Steps Taken by University

Today, it's a noticeable fact that environmental science lessons are implemented beyond the classrooms and are practiced in our day-to-day lives. And leading from the front is our university campus. The climate of university is Tropical Wet and Dry. Nestled on a lush, green 64-acre campus in Bangalore, sustainability is a

priority at Presidency. Everyone on campus has a part to play in green initiatives for improving our built environment and natural ecology.

Along with educational and technological evolution, Presidency University acknowledges the significance of an inspiring environment and puts in continuous efforts to build a Sustainable Campus. The University has successfully adopted and implemented best practices in the areas of sanitation, hygiene, waste management, water management, energy management, and greenery management.

To instill the values of social, economic, and environmental responsibility and make a meaningful impact, the university takes the following action steps:

- Develop 36 acres of green space within the campus and implement sustainable maintenance
- Promoting the use of a sustainable mode of transportation
- Use of bicycles for commuting within the campus
- Water conservation and rainwater harvesting for use on the campus
- Combat food waste and improve the overall waste management system focused on recycling
- Use of vermin compost to enhance soil fertility physically, chemically, and biologically
- Raise awareness of plastic pollution
-

1.3 Objective Of the Environment Audit

In recent times, the Environment Audit of an institution has been becoming a paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. The University has been putting efforts to keep our environment clean since its inception. Therefore, the purpose of the present green audit is to identify, quantify, describe, and prioritize the framework of Environment Sustainability in compliance with the applicable regulations, policies, and standards. The main objectives of carrying out Green Audit are:

More efficient resource management

1. To provide a basis for improved sustainability
2. To enable waste management through reduction of waste
3. Generation, solid- waste and water recycling

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

4. To create plastic free campus and evolve health consciousness among the stakeholders
5. Recognize the cost saving methods through waste minimizing and Managing
6. Point out the prevailing and forthcoming complications
7. Authenticate conformity with the implemented laws Empower the organizations to frame a better environmental performance
8. Enhance the alertness for environmental guidelines and duties
9. Impart environmental education through systematic environmental Management approach and improving environmental standard
10. Development of ownership, personal and social responsibility for the University and its environment
11. Developing an environmental ethic and value systems in youngsters

1.4 Pre-Audit Stage

A pre-audit meeting provided an opportunity to reinforce the scope and objectives of the audit and discussions were held on the practicalities associated with the audit. This meeting is an important prerequisite for the green audit because it is the first opportunity to meet the audited and deal with any concerns. It was held at Presidency University, Bangalore on 4th& 5th May 2023. The meeting was an opportunity to gather information that the audit team can study before arriving on the site. The audit protocol and audit plan were handed over at this meeting and discussed in advance of the audit itself. In Presidency University, Bangalore pre-audit meeting was conducted.

1.5 Management's Commitment

The Management of the University has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly such as awareness programs on the environment, campus farming, planting

More trees on the campus etc. after the green auditing. The management of the University was willing to formulate policies based on green auditing report.

1.6 Methodology

The purpose of the Environment audit is to ensure that the practices followed in the campus are in accordance with the Green Policy of the country. The methodology includes collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

1.7 Duration of the Environment Audit

The Green audit field carried out the data collection was carried from 04th& 05th may, 2023

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

CHAPTER-02

GENERAL OVERVIEW OF THE CONCEPT OF LAND USE

2.1Site Overview of the Land use

Land use refers to man's activities and the various uses which are carried on and derived from land. Viewing the earth from space, it is now very crucial in man's activities on natural resource. In situations of rapid changes in land use, observations of the Earth from space give the information of human activities and utilization of the landscape.

Remote sensing and GIS techniques are now providing new tools for advanced land use mapping and planning. The collection of remotely sensed data facilitates the synoptic analyses of earth system, functions, patterning, and change in the local, regional as well as at global scales over time. Satellite imagery particularly is a valuable tool for generating land use map.

Figure 1:Presidency University, Bangalore Satellite View

2.2 Methodology Adopted for Land Use Mapping

Three types of data that are GPS points, field survey data and Google earth data for Geo referencing have been used in this study. Land use map of the study area have been prepared using the above three types of data with the help of ArcGIS Pro software.

2.3Data Processing and Analysis

Land use map preparation is executed through the following steps:
Geo-coding and Geo referencing of satellite imageries by extracting the ground control points. Supervised classification was carried out with the aid of ground truth data collected during field survey. Scanning and digitization of maps and editing of all the Geo referenced maps were done using GIS. Data manipulation and analysis and linking the spatial data with the attribute data for creation of topology was carried out using GIS software. Creation of GIS output in the form of land use map showing various land use have been prepared.
Therefore, attempt has been made in this study to map land use for Geography Department of with a view to detect the land consumption in the built-up land area using both remote sensing and GIS techniques.

2.4Geographical Location with Campus Map is Scale

The University has a sprawling pollution-free campus spread over 64 acres of land in the heart of District. Presidency University is located in the city of Bangalore in India (Karnataka). The University was established in 2015 as a Private University vide Private Universities Act 41 of 2013 and operates from a single campus. The University campus has state of the art infrastructure and modern amenities

The present study revealed that the PU campus has a total of 64 acres of land of which 38.4 acres has green cover. It is found that a total of about 25 acres (~40% of total) are under the built-up category, of which academic departments administrative units and canteen form a significant part

Figure 2: Presidency University, Bangalore

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

2.5PU Campus Building

PU (Main Gate)	Management building
	
Engineering	**Management building**
	
	

Figure 3: Total Campus Building

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Table 2: Area Description Campus

Details of Built-up area

Total built-up plinth area	**1476000**

Details of Open area

Particulars	Sq. Ft.
Foot Ball Ground (Proposed)	4358
Volleyball Court (Proposed)	3960
Basketball Court (2) (Proposed)	9716
Garden cum Students Canteen	15456
Garden 1	14563
Garden 2	19740
Garden 3	1937
Garden 4	1657
Garden 5	3993
Paved road	49065
Garden 6	1872

THE RATIO OF OPEN SPACE AREA TO TOTAL AREA

Ratio of open space towards total area: 60 %

Table 3: Open space Area Description

Space Name	Total area
TOTAL LAND AREA 64 ACRS	**258999.0 m2**
GREEN COVER AREA 38.4	**155399.3 m2**
The built-up category, of which academic departments dministrative units and canteen form a significant part	**103599.5 m2**

The entire campus is design in using green concept and gardening is done with the best landscape in design in the campus

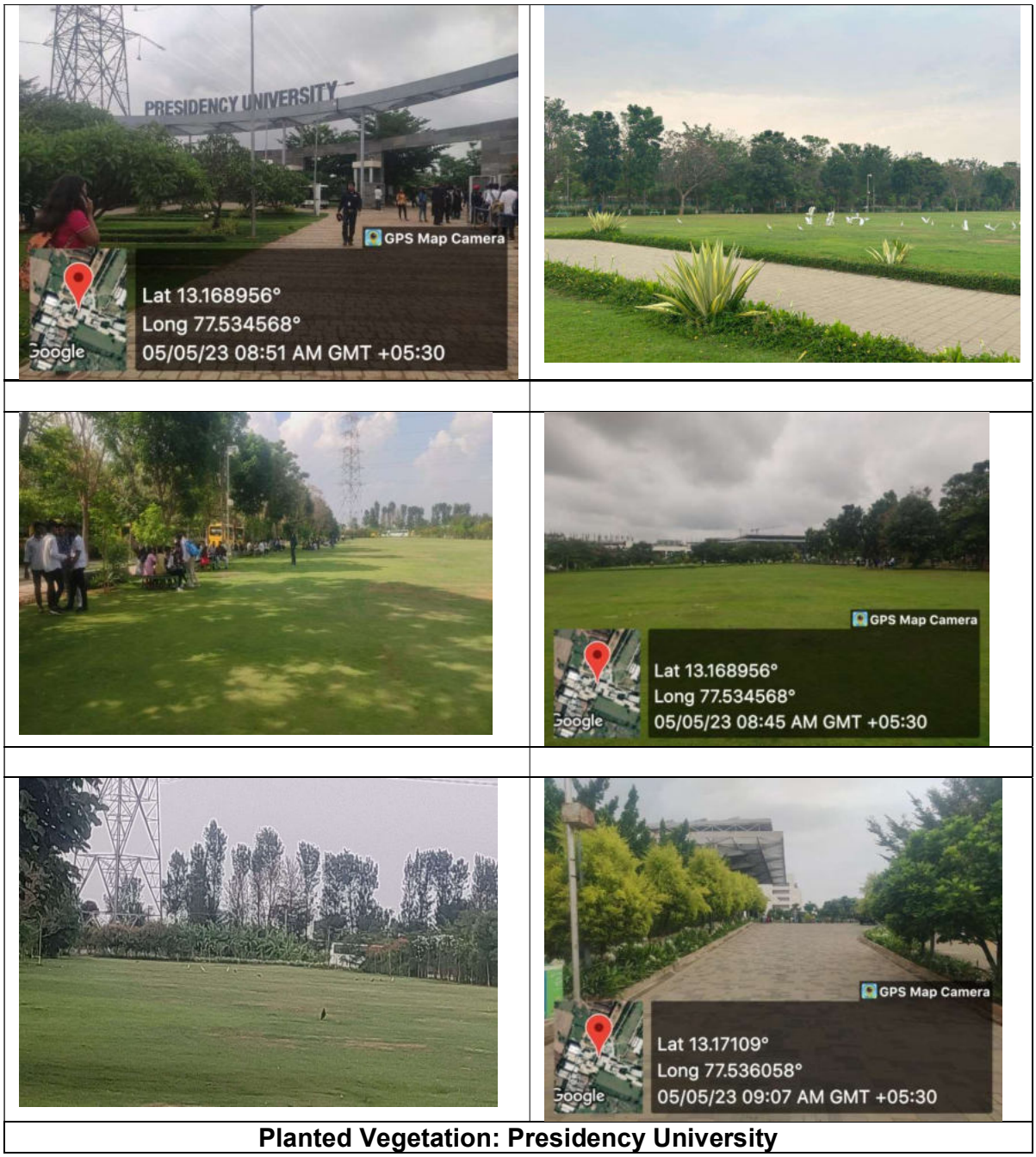


Figure 4: TOTAL AREA ON CAMPUS COVERED IN PLANTED VEGETATION

CHAPTER-03

Waste Audit and Recycling Program

3.1 Impactful University Program(s) on Climate change

Waste cannot be avoided in any environment. Wastes can be classified as Biodegradable and No biodegradable wastes. Biodegradable wastes include food wastes, which can be easily decomposed by the bacteria in the soil. But no biodegradable wastes are those which cannot be degraded by any
Organism and remain as such for many years. Much amount of waste is generated from the college campus.

1 **CANTEEN**
The food waste generated from the canteen and Hostel is collected and given to animal's waste is generally less generated from the canteen. The plastic waste generated is collected by staff of IMC

2 **LIBRARY**
The most generated waste is paper waste. It is taken for recycling.

3 **OFFICE**
Paper waste generated is recycled and reused.

4 **GARDEN**
Plastic and paper waste is comparatively less.

5 **AUDITORIUM**
The wastes are collected after each program to collected and given to M.C.I. Vehicles

6 **BATHROOM**
The wastes are collected in dust been and collected by M.C.I

7 **CLASSROOMS**
Paper Wastes are collected in the wastebasket and recycled.

8 **LABORATORY**
The broken glass wastes and useless instruments are disposed of for recycling after thorough washing.

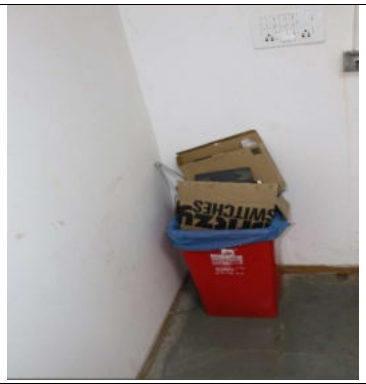
9 **COLLEGE PREMISES**
Plastic waste generated is usually less. But paper waste is generated in a larger amount by students.

3.2 Recycling Program for University waste

1. Presidency University has an organic waste recycling program, all the organic waste is converted into compost using vermiculture technique.
2. Dry and wet waste segregation is done, and the waste is disposed of accordingly.
3. At various locations, red dustbins are installed. The e-waste is then disposed appropriately.

Organic Waste Recycling (Presidency University, Banglore, India)

Separate dustbins for Wet and Dry Waste



dustbin for E-Waste segregation & medical waste

Figure 5: Recycling Program for University Waste

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

3.3 Program to Reduce the use of Paper and Plastic on Campus

1 Presidency University is technology friendly and uses technological interventions in majority of its operations. Attendance is monitored through using Zoho people application thereby reducing the need for maintaining physical attendance registers.

2 Presidency University advocates paperless systems. Majority of the communications take place through Slack communication channel and via emails thereby avoiding unnecessary printing and wastage of paper.

3 The University strategic plan too has sustainability goals incorporated in it.

4 The University has adopted Knimbus Digital library to promote digital learning.

5 Student enrolment is also done using a in house developed software called "MyPresidency".

Figure 6: Program to reduce the use of Paper and Plastic on campus

3.4 Organic Waste Treatment

At Presidency University, Organic waste is produced in the cafeteria and mess. The organic waste is then segregated and transferred to vermiculture facility. The vermicompost prepared is used for organic farming on campus.

REGISTRAR

Organic Waste Treatment (Presidency University, Banglore)

Organic Waste Treatment (Presidency University, Banglore)

Figure 7: Organic Waste Treatment

3.5 Inorganic and Toxic Waste Treatment

1 Red dustbin are used for e-waste segregation at Presidency University. The e-waste is then disposed appropriately.
2 Presidency University as such does not produce any toxic waste products, however the waste from power backup unit is collected and handed over to local municipal corporation to be disposed of appropriately.

Inorganic and Toxic Waste treatment (Presidency University, Banglore, India)

Figure 8: Inorganic Waste Treatment

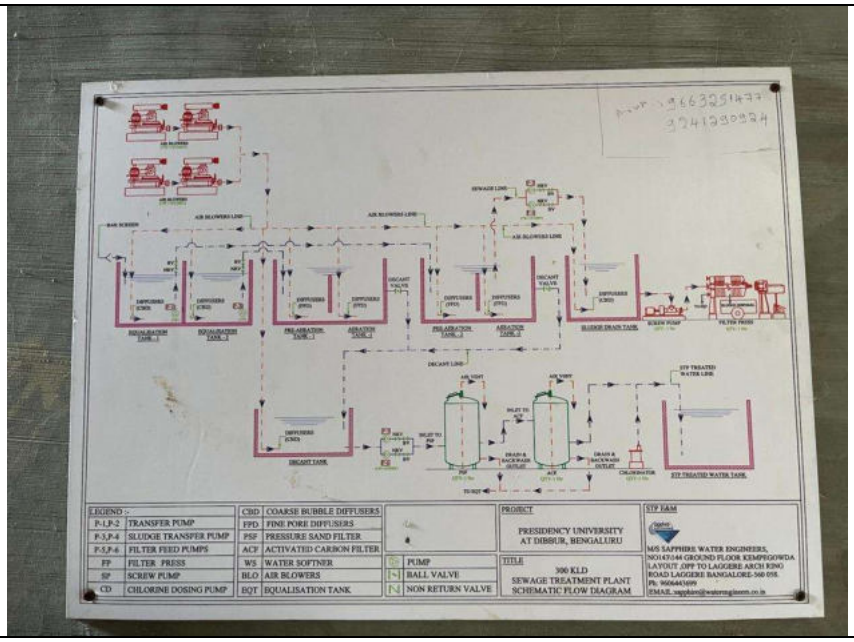
REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

3.6 Sewage Disposal

Presidency university with a student and staff population is estimated to consume 650 KLD or 195 million liters annually (as per NBC guidelines - 45lpcd). As per the data provided by the university, total water consumption in a campus is 350 KLD for academic and 150 KLD for irrigation. It is reported that the water tanks are filled once a day.

The wastewater generated in the University campus is treated in campus and the treated water is used for watering of garden area. As per the information provided by the University, a 300KLD STP is installed, treated water is used is mostly in garden irrigation with fully automated irrigation system, but is RO reject and some wastewater generated is being drained out into the public sewers. However, this 300 KLD is not sufficient to treat the 650 KLD sewage estimated to be generated in the campus. Hence, there is a gap of 350 KLD.

The quantity of wastewater generated in the campus is assessed as per IS standards (IS 9868/1981)which is 45 liters per day per person.



Sewage Treatment Plant Layout

Sewage Treatment Plant 300 KLD (Presidency University, Banglore, India)

Sewage Treatment Plant Layout

Sewage Treatment Plant out side (Presidency University, Banglore, India)

Figure 9: Sewage Treatment Plant

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

CHAPTER-04

WATER AUDIT WATER MANAGEMENT

4.1 Details Water Management

A water audit is an onsite survey and assessment to determine the water use and improving the efficiency of water use. Conducting a water audit involves calculating water use and identifying simple ways for saving water in the institution on Home.

Borewell Details					
Borewell SL No	**Location**	**Capacity**	**UOM**	**Quantity**	**Borewell pipe length in feet**
1	Main Gate	20	HP	1	1040
2	Near Admin G Block	20	HP	1	1080
3	Near MBA Block canteen	7.5	HP	1	1000
4	Jungle borewell	17.5	HP	1	1000
5	Near Cicon labour Shed	15	HP	1	1100
6	Ramesh Galappa	NA	HP	1	NA
7	Near Cicon Gate	15	HP	1	500

Tank Details – 2022				
S L NO	**QUANTITY**	**CAPACITY**	**UOM**	**TYPE**
1	1	750	liters	sintex
2	3	1000	liters	sintex
3	4	2000	liters	sintex
4	18	5000	liters	sintex
5	5	10000	liters	sintex
6	1	115000	liters	sump
7	3	150000	liters	sump

Table 4: borewell and tank Description

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

4.2Water Audit Observation

Presidency university with a student and staff population is estimated to consume 650 KLD or 195 million liters annually (as per NBC guidelines- 45lpcd). As per the data provided by the Presidency university, total water consumption in a campus is 350 KLD for academic and 150 KLD for irrigation. It is reported that the water tanks are filled once a day.

The wastewater generated in the University campus is treated in campus and the treated water is used for watering of garden area. As per the information provided by the University, a 300KLD STP is installed, treated water is used is mostly in garden irrigation with fully automated irrigation system, but is RO reject and some wastewater generated is being drained out into the public sewers. However, this 300 KLD is not sufficient to treat the 650 KLD sewage estimated to be generated in the campus. Hence, there is a gap of 350 KLD.

The quantity of wastewater generated in the campus is assessed as per IS standards (IS 9868/1981)which is 45 liters per day per person.

Rainwater harvesting project is started by the university by recharge pit is constructed in to borewells, still channelizing is required for borewell. Our recommendation to make complete survey for water recharging design for campus and building

Sl. No	Name of the equipment	Location	Quantity	Capacity HP	Pumping to	OHT numbers	OHT capacity (KL)	Water used in KL
1	Borewell	Main Gate	1	20	Main gate water fountain			
					Main gate security washroom	1	0.75	0.75
					sprinklers (3 main lawn area and 1 near ATM			0
					Hostel canteen	1	10	10
					150 KL irrigation sump			0
	Borewell	Near G	1	20	Gardening			0

Sl. No	Name of the equipment	Location	Quantity	Capacity HP	Pumping to	OHT numbers	OHT capacity (KL)	Water used in KL
		block						
2					Central admin	2	5	10
					F Block	3	5	15
						1	2	2
					D block	1	3	3
					E Block	2	5	10
					E Block faculty washroom	1	5	5
					Admin G	1	5	5
3	Borewell	Near MBA block canteen	1	7.5	Domestic water sump 150 KL			150
					MF classroom	3	5	15
					MF classroom (RO)	1	10	10
					Library	2	10	20
					Old admin	1	5	5
					COE office	1	5	5
4	Borewell	Jungle borewell	1	17.5	Irrigation tank 150 KL			0
5	Borewell	Near Cicon labour shed	1	15	0			
					Phase 3 Q block	1	10	10
					cicon labour shed	1	5	5
					cicon labour shed	1	2	2
					Phase 3	2	5	10

Sl. No	Name of the equipment	Location	Quantity	Capacity HP	Pumping to	OHT numbers	OHT capacity (KL)	Water used in KL
					workshop			
6	Borewell	Ramesh Galappa	1	NA	Irrigation tank 150 KL	1		150

Table 5: Bore well details- water pumped

Since there is some along water meter has been installed borewell to quantify the metering for water discharge data has taken by previous record to understand the water uses in the campus

There are various pump installed in the campus for water use in different application as per table given below

Water Pump Details for various application					
S NO	Description	CAPACITY	QUANTITY	LOCATION	Running Time per day (Approx) Presently records not maintained
1	**Filtration Pump**	**.5HP**	**1**	**Main Gate Fountain**	**4 Hours**
2	**Filtration Pump**	**.5HP**	**1**	**Main Gate Fountain**	**4 Hours**
3	**submersible pump**	**2HP**	**1**	**Main Gate Fountain**	**6 Hours**
4	**submersible pump**	**2HP**	**1**	**Main Gate Fountain**	**6 Hours**
5	**Filtration Pump**	**1.5HP**	**1**	**Round Fountain**	**4 Hours**
6	**Filtration Pump**	**1.5HP**	**1**	**Round Fountain**	**4 Hours**
7	**submersible pump**	**2.5HP**	**1**	**Round Fountain**	**8 Hours**
8	**submersible pump**	**2.5HP**	**1**	**Round Fountain**	**8 Hours**

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Water Pump Details for various application					
S NO	Description	CAPACITY	QUANTITY	LOCATION	Running Time per day (Approx) Presently records not maintained
9	Filtration Pump	.5HP	1	Admin Fountain	4 Hours
10	Filtration Pump	.5HP	1	Admin Fountain	4 Hours
11	submersible pump	2HP	1	Admin Fountain	7 Hours
12	Filtration Pump	.5HP	1	Canopy Fountain	4 Hours
13	Filtration Pump	.5HP	1	Canopy Fountain	4 Hours
14	submersible pump	2HP	1	Canopy Fountain	8 Hours
15	Hi pressure Pump	7.5HP	1	Pump Room	NA
16	Hi pressure Pump	7.5HP	1	Pump Room	NA
17	Mano Block	15HP	1	Pump Room	3 Hours
18	Mano Block	15HP	1	Pump Room	3 Hours

Table 6: Various Pump details for water pumped

During the observation at PU campus status of borewell and their uses for per day as per table given

Source of Water		
Sl no	Parameters	Information
1	No. of Bore wells	6 nos. 4 in working condition
2	No of motors used	4 nos'
Quantity of water used in different sections of the campus		
	Sections	Water used per day
	G/F and 1st floor	5,000
	B/G To 2nd floor	15,000
	B/G To 1st floor	5,000
	G/F and 2nd floor and canteen	25,000
	Connect to Ro raw water	10,000
	B/G To 2nd floor	7,000
	For Hostel	10,000
	G/F and 2nd floor	10,000
	G/F and 2nd floor	10,000
	3rd floor washroom	5,000
	connect labs	2,000
	G/F and 2nd floor	10,000
	G/F and 2nd floor	5,000
	G/F and 2nd floor	5,000
	L Block G/f to 2nd floor	7,000
	B/F to 2nd floor	30,000
	washroom and labs	5,000
	Washroom	2,000
	No of water taps	270
	No of Wash basins	270
	No of Urinals	323
	No of Water closet	429
	Hot and cold-water dispenser	33
	Drinking water filters	25
	Water meters at every inlet	No

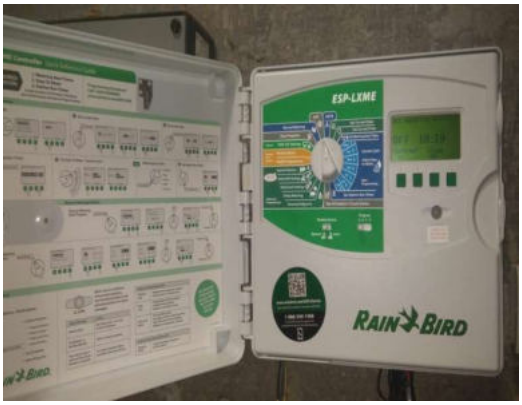
Source of Water		
Sl no	Parameters	Information
	of sintex / tanks	
	Any water wastage/why?	Yes, very less leakage from wash basin in several washrooms
	Wastewater sources	Overflowing of tanks, canteen, toilets, labs
	Any wastewater treatment for lab water	No
	Rainwater harvesting	No
	Whether any green chemistry method practiced in Labs	No

Table 7: Reported water usage and related data

Since there is no proper metering for water management data has taken by previous record to understand the water uses in the campus

4.3Details of fully automated irrigation system at Water Audit Observation

It is observed that the PU installed Drip Irrigation system which is water efficient for gardening/horticulture. **The drip irrigation system will save 30-50% of water.** By installed drip irrigation system, the requirement of water for greenbelt (horticulture) could be met from available recycled / treated wastewater



Entrance track

Pedestrian friendly pathway with drip irrigated

Pipelines are Well connected roads and pedestrian pathway

The University management Has a strong commitment for most efficient water uses in campus all irrigated with fully controlled automated irrigation system with rain and moisture sensor to avoid zero wastage in the field

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

4.4Details of water recharging system at PU

During the visit the visit some Rainwater Harvesting work has started for bore well recharge at various location as per shown in figure

No Rainwater Harvesting or Recharge completed in the campus. Source of water for the campus is through ground water exploration – 6borewells (3 nonfunctional– dried up) supply the required waterfor the campus.

Water Recharge Pits for collection of Rain water

Bangalore experiences an average of 850mm of rainfall annually and spread over 45 days during the monsoon. This water could be harvested and stored for gainful use. The Presidency University with its 64 acres campus has a potential to harvest almost 100ML of rainwater within the campus annually. The potential is about 60%

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

of the water drawn by the University Currently, there are some RWH structures within the campus and it is recommended to implement the same. This will ensure that the University's water footprint is minimized. A minimum of 150 harvesting structure/ recharge pits needs to be installed.

Rainwater Harvesting from the entire campus including open areas to be undertaken as early as possible. This is also mandated as per the AICTE norms and as per the Bangalore Water Supply and Sewerage Bill (mandatory rainwater recharge or harvesting for sites more than 60X40 feet).

Ideas regarding Water Saving University is:

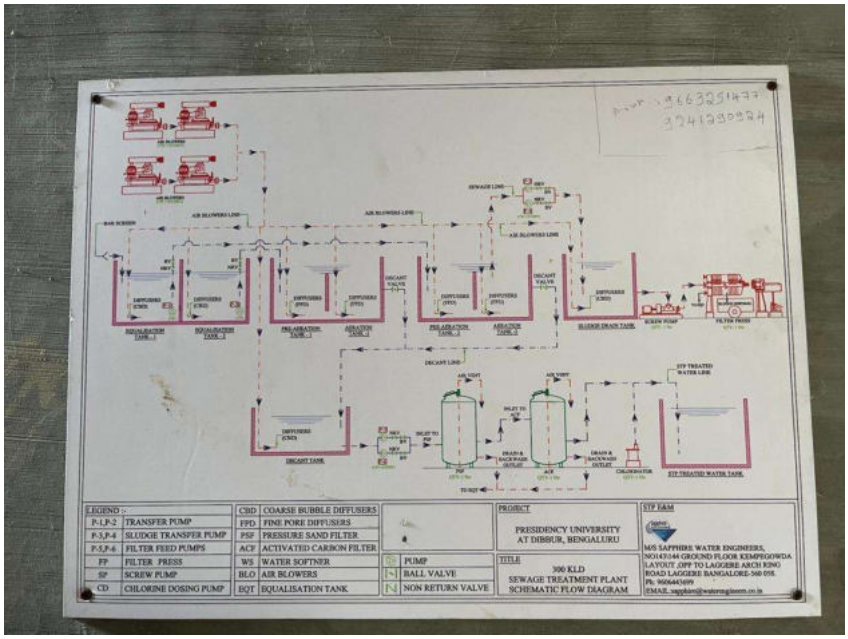
1. By Tap water leakage control.
2. Use of minimum water needed for daily use.
3. Open the tap less while washing hands.
4. Turn off the taps after use closely & lightly.
5. Install rainwater tanks.
6. Use of water ball for water tanks to prevent overflow of water.
7. Use of solar heating system so as to save fuel and electricity to save water

Saving water helps to reassure our environment. It reduces the energy required to process and deliver water which helps in counseling resources.

4.5 Sewage Disposal STP

The wastewater generated in the University campus is treated in campus and the treated water is used for watering of garden area. As per the information provided by the University, a 300KLD STP is installed, treated water is used is mostly in garden irrigation with fully automated irrigation system, but is RO reject and some wastewater generated is being drained out into the public sewers. However, this 300 KLD is not sufficient to treat the 650 KLD sewage estimated to be generated in the campus. Hence, there is a gap of 350 KLD, which isuntreated sewage which is being let out from the campus.

The quantity of wastewater generated in the campus is assessed as per IS standards (IS 9868/1981)which is 45 liters per day per person.



Sewage Treatment Plant Layout

Sewage Treatment Plant 300 KLD (Presidency University, Banglore, India)

Sewage Treatment Plant Layout

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Sewage Treatment Plant (Presidency University, Banglore, India)

Figure 10: Sewage Treatment Plant

4.6Key Finding

Main water uses in the campus

1. Garden
2. Lab
3. Drinking
4. Cleaning
5. Washing
6. Toilets
7. Hostel
8. Canteen
9. Staff Question

Reasons for water wastage

1. Leakages from taps
2. Overuse of water
3. Overflow of water tanks
4. Gardening with pipe instead of sprinkle system
5. Other reasons-

REGISTRAR

1. There is no water consumption monitoring system in the University campus.'
2. The University does not have sufficient wastewater Treatment plant for water waste, generated from laboratories, canteen, Hostels.
3 There is rain harvesting system in one building. Need of more system in every building of university.
4. Automatic switching system is not installed for pump sets used for overhead tank filling.
5. Display board against the misuse of water & water leakage

4.7Recommendation

- It is suggested to install following water efficient fixtures in the buildings to save domestic water consumption. Overall, 15-20% domestic water consumption will be reduced by installing and maintaining suggested fixtures:

- **Retrofit flow restrictors in handwashing taps and other taps:** Retrofit high flow rate handwashing taps with 'aerators and flow restrictors' so as to have 3-5 lpm flow rate in hand washing taps and 7 lpm flow rate in pantry and other taps in the buildings.

Figure 11: Details Analysis of Water Audit Trap

- **Stop use of filtered water in toilet flushing, instead use recycled, treated wastewater or raw water.** It is suggested to use low quality water for flushing instead of good quality filtered water.
- **Install 'Tank Bank (For Flush Tanks)' or install with Water efficient flushes with dual flush Cistern 3-6 liters capacity flush tanks –** In toilets filtered groundwater is used for flushing and about 7-10 liters of freshwater is flushed per flush. To reduce the flushing water per flush, it is suggested to install scientifically designed easy to install 'Tank-Bank' in the existing flush tanks. By just placing tank bank in the flush tank, we displace and save water equal to the space occupied by the tank bank for every flush.

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

This will save about 20% of flush water in toilets. However, the existing 7-10 liters flush tanks can also be replaced by Water efficient flushes with dual flush Cistern 3-6 liters capacity flush tanks to save water. This will save about 40% of the flush water in toilets.

1 Remove damage taps and install sensitive taps if possible
2 Drip irrigation for gardens and vegetable levitation can be initiated.
3 Water treatment system for Lab water.
4 Awareness program on water conservation to be continue.
5 Install display boards to control over exploitation of water.
6 Sensors should be fitted in all taps.

- It is suggested that the plant should install Drip Irrigation system which is water efficient for gardening/horticulture. **The drip irrigation system will save 30-50% of water.** By installing drip irrigation system, the requirement of water for greenbelt (horticulture) could be met from available recycled / treated wastewater. The benefits of the drip irrigation system are given below:

Benefits of a Drip Irrigation System:

- **Saves Water:** Studies show that drip irrigation systems use 30 – 50% less water than conventional watering methods, such as sprinklers or using open ended hose pipes.
- **Improves Growth:** Smaller amounts of water applied over a longer amount of time provide ideal growing conditions. Drip irrigation extends watering times for plants & prevents soil erosion and nutrient runoff. Also, because the flow is continuous, water penetrates deeply into the soil to get well down into the root zone.
- **Discourages Weeds:** Water is only delivered where it's needed.
- **Saves Time:** Setting and moving sprinklers is not required. A timer can be added to the system for automatic watering.
- **Helps control fungal diseases**, which grow quickly under moist conditions. Also, wet foliage can spread disease.
- **Adaptable:** A drip irrigation system can be modified easily to adjust to the changing needs of a garden or lawn.

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

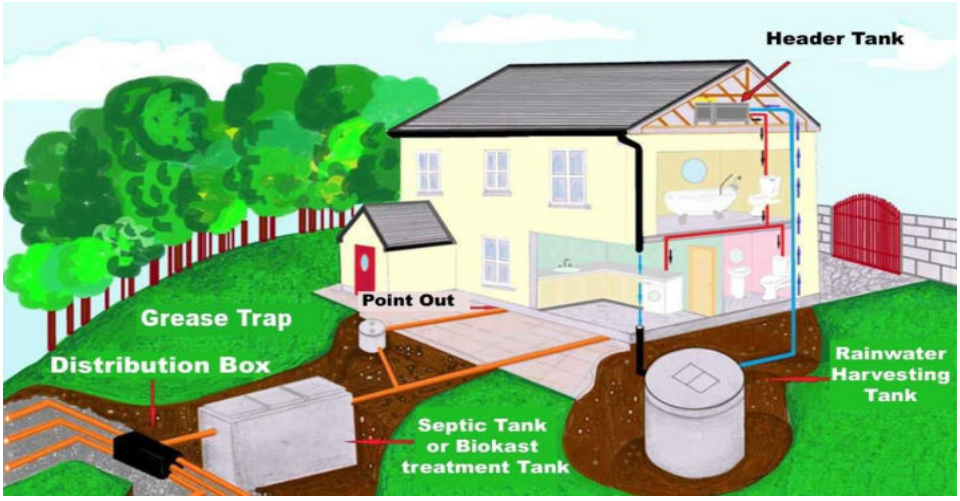
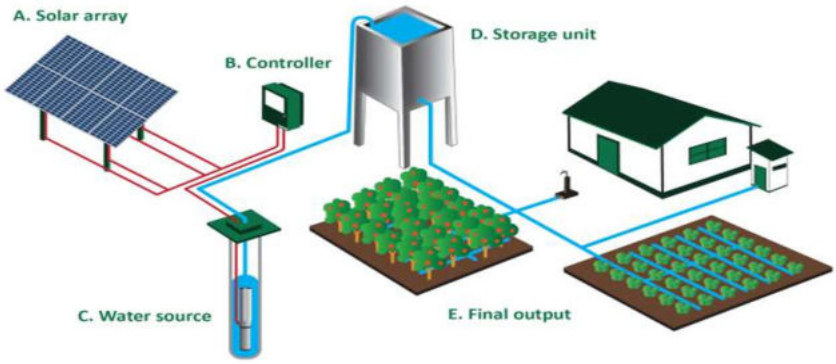


Figure 12 Rainwater Harvesting System

- System of irrigation/gardening should be improved to control water wastage.
- Regular services for purifiers of drinking water should be continued in future also.
- The toilet washrooms are equipped with the push buttons.
- Replace old and conventional pump to new energy efficient solar pumps.
- Reuse and recycle of wastewater.
- Rainwater harvesting system must be there in campus.



CHAPTER-05

ENVIRONMENTAL INITIATIVE & RECOMMENDATION

5.1 Environment Audit observation

The performance of the University on each of these indicators were examined, and recommendations were offered about how the University can reduce its environmental impact within each indicator. The following table provides an accurate snapshot PresidencyUniversity's environmental impact at this (2021-22) point in time, and that it will aid the University in prioritizing positive steps it can take to improve overall sustainability. This Environment Audit Report is a document to be revisited periodically by the University for implementation of measures as suggested.

Water Conservation		
sl.no	**Desirable**	**Current Practice**
1	Rainwater Harvesting from the entire campus including open areas to be undertaken as early as possible. This is also mandated as per the AICTE norms and as per the Bangalore Water Supply and Sewerage Bill (mandatory rainwater recharge or harvesting for	Rainwater Harvesting from the entire campus including open areas to be undertaken as early as possible. This is also mandated as per the AICTE norms and as per the Bangalore Water Supply and Sewerage Bill (mandatory rainwater recharge or harvesting for sites more than 60X40 feet).
2	Reverse Osmosis for drinking purpose is installed and the reject is let into drain	Reject of Reverse Osmosis to be treated and recycled
3	There are very innovative methods of conservation of water practiced in the campus: Simple plastic tags used on water taps to arrest excess flow of water.	All taps in the campus to be fitted with water conservation devices. A Student project on conservation of water using the plastic tag to
4	It is assumed that such a practice will save about 80% of water as against the taps without this measure. However, no measurements have been done	be undertaken and actual water savings to be taken up along with other water conservation measures study, which is an awareness activity also.
5	Dedicated water metering at all the building and other uses in RO, irrigation Gardening, Mess and offices	Only analog meter is installed at various borewell location but not recorded and maintain properly

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

6	The requirement of water for greenbelt (horticulture) could be met from available recycled / treated wastewater	PU has installed 300KLD STP and treated wastewater is only utilizing in irrigation of campus
7	Presidency University with its 64 acres campus has a potential to harvest almost 100ML of rainwater within the campus annually	PU has planned and design the potential is about 60% of the water drawn by the University Currently, there are some RWH structures
8	Installation of Drip Irrigation and sprinkler system which is water efficient for gardening/horticulture.	The drip irrigation/popup and sprinkler are installed drip irrigation system, along with fully automated with rain and moisture system for

Waste Management

sl.no	Desirable	Current Practice
1	Solid Waste: Color coded dustbins for segregation of waste in open areas & canteen installed.	Source segregation of waste to be practiced in the entire campus & IOT based waste data to be maintained. Biogas plant or compost plant to be installed for food waste generated from campus.
2	E-Waste: Separately being stored and being sold as scrap	E-Waste Inventory for the campus to be undertaken and the E-Waste generated in the campus to be handed over to the formal authorized recyclers
3	Segregation of waste as per norm and the quantification of waste	Segregation of waste is done. Although the campus has provision for collection and storage of segregated waste, the waste is mixed at source itself. The quantification of waste is not practiced.
4	Inhouse treatment or recycling of waste practiced	No inhouse treatment or recycling of waste practiced in the campus. The temporary storage of waste in the campus is poorly managed
5	E-Waste management system	Outsources the E-Waste management system not established, no explicit paperless policy adopted
6	Segregation of waste as per norm and the quantification of waste	outsources the management for hazardous waste generated within the campus, like the waste oil rags from the generators, laboratory waste, pesticide cans used in the gardens etc.

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Wastewater Management		
sl.no	**Desirable**	**Current Practice**
1	Plan for the wastewater management	Only analog metering is done, not optimize the use of wastewater
2	Sewage Treatment Plant installed but not operational for 300 KL/D. Deficit of 350 KLD of wastewater generated needs to be treated within the campus. Treated and untreated water discharged into sewer line	100% of sewage in the campus to be treated. Recycling of the treated water from STP for non-potable purpose within the campus to be undertaken
3	No plan for the proposed sludge removal from the STP planned.	Utilization of Sludge from STP withing the campus to be undertaken
Bio-diversity Conservation		
sl.no	**Desirable**	**Current Practice**
1	Campus has not capitalized on the abundant green cover.	Student projects on the herbal or biodiversity aspects and climate change aspects for the green cover to be undertaken
2	Biodiversity of the campus	Very rich Biodiversity of the campus, management putting best effort
3	The benchmark for best green cover is at least 30 percent of the campus area	This campus boasts a whopping 40 % green cover The campus also has>20 number of species of trees and 150 number of species of shrubs and herbs. Biodiversity value of the campus is very good. A list of birds, insects and other fauna is also available

REGISTRAR

5.2 Solar power plant

The survey has been completed there are available sufficient area on main building roof and hostel roof area in premises of institute, and it is suggested to install 230 kW solar plant on building roof area, Details are given below:

Solar Power plant commissioning has been done on Oct 17th, 2022				
Month	Solar Units Generation	Solar Exports units	Bescom units used	Bescom bill amount
Oct-22	449.9	NA	68960	1174182
Nov-22	20512	NA	76680	841726
Dec-22	15600	181.5	50400	564991
Jan-23	26264	1840	58540	620033
Feb-23	30120	1454	63220	662582
Mar-23	32664	1920	97140	969460
	125609.9	**5395.5**	**414940**	**4832974**

- **Roof Top Solar Photovoltaic**

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Currently there is Roof Top Solar provisions at the college campus. The Presidency University has installed capacity is 230 Kw it has generated 1.25 lacs units form oct 22 to March 2023
It contributes 10 % of electric consumption
The Presidency University has ~138053 Sqm of roof area. Assuming even 7-10 % of the roof is dedicated to SPV, there is a potential to install nearly 1400 kWp of roof top grid connected SPV. This has a potential to generate about 5400 units every day or nearly 156000 kWh monthly. This can almost bring Presidency University to a net zero consumer, as per demand is increase by almost 40%. The Presidency University make a five-year plan to achieve this.
The Presidency University make a next year plan to go for 330 Kw solar power will contribute 25% of exiting use

5.2 Use of Electrical vehicle in the campus

Program to Limit or Decrease Parking Area on Campus for the Last 3 Years (2018 to 2020)

1 Shuttle service is provided for faculty and students thereby decreasing the use of more vehicles.
2 Free Bicycles are provided for in campus commuting thereby promoting good health.
3 Carpool facility is there amongst faculty thereby decreasing the use of more vehicles.


Shuttle service


Ele -Bicycles for Campus use

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

Carpool

Figure 13: Program to limit Parking Area at Presidency

5.3 Use of water fountain in the campus

1 At Presidency University we use water fountain for suspended dust separation and ambient cooling it also enhances the overall environment

Water fountain at Main ADM Building

Fountain at administrative building

WATER FOUNTAIN IN ENGINEERING BLOCK

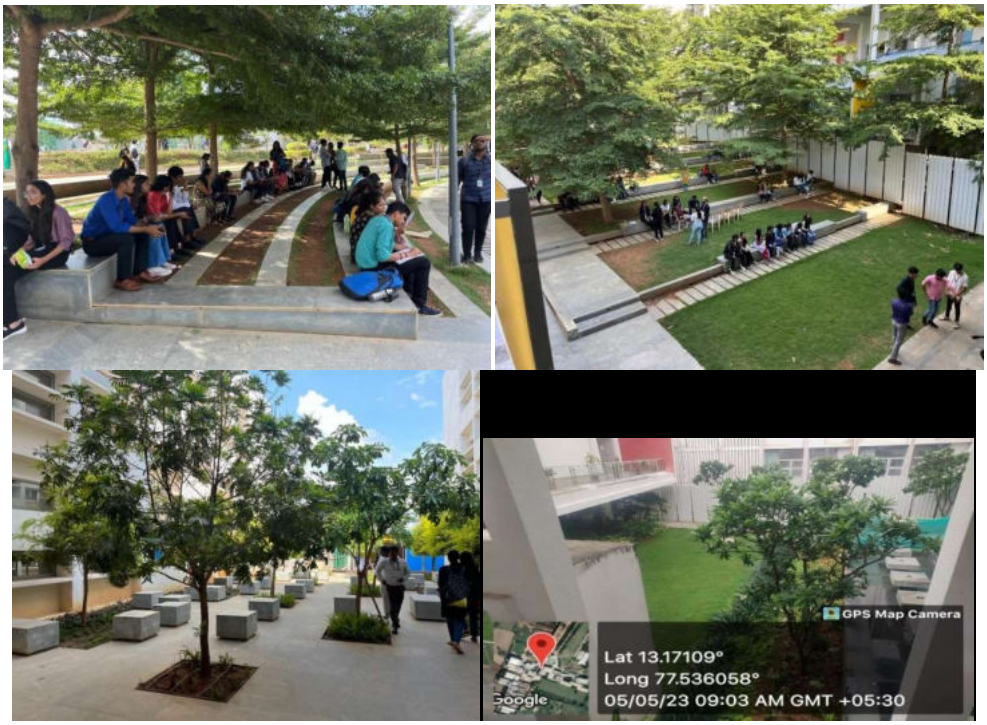
Figure 14: Installation of water fountain at PU

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE

5.4 Use of Landscape in the campus building

Plants are planted in every floor of the University building to ensure that there is proper oxygenation inside.



Indoor plants for maintaining the oxygen level and promoting sustainability

Figure 15: *Indoor plants for maintaining the oxygen level* at Presidency

REGISTRAR
PRESIDENCY UNIVERSITY Registrar BANGALORE

5.5 Enviro Club in the campus

The University has a separate Enviro Club in the campus. The programmes like Sale of Cloth bags by students to discourage single use plastic bags, Plantation drive, Cleanathon drive etc., are notable efforts. Programmes which had environment or ecological agenda were delineated and examined for the effectiveness.

- The Enviro Club in the College is a good practice adopted which is proof of the student involvement.
- There is no feedback analysis to verify whether the awareness levels of the students have increased due to such campus programme, which is imperative
- The students have participated in several inter college environment competitions, which also proves the student involvement in green initiatives, encouraged by the college

REGISTRAR

GAIN MORE KNOWLEDGE REACH GREATER HEIGHTS	**PRESIDENCY UNIVERSITY BENGALURU Environmental Cell Presidency University (ECPU)**	DSA Department of Student Affairs Presidency University, Bengaluru

Ref. No. PU/PUEC/21-22/Report/08 DATE: 20 APRIL 2022

A BREIF REPROT ENVIRONMENTAL CELL OF PRESIDENCY UNIVERSITY (ECPU) IN COLLABRATION WITH NSS CELL HAS ORGANISED A CAMPAIGN ON 20TH OF APRILTO CREATE AWARENESS ABOUT THE DISADVANTAGESOF USING PLASTIC. THE CAMPAIGN WAS NAMED AS 'SAY NO TO PLASTIC'.

Conveners:
Dr. Saravanan C, Professor, Department of Chemistry and Chairperson – ECPU
Aparna Shukla, Asst. Professor, School of Law, Unit 5 Faculty coordinator
Dr. Venkatesh Raju K, Asst. Professor, Dept. of Civil Engineering

Environmental Cell of Presidency University (ECPU) in Collaboration with NSS club has conducted a campaign on **say no to plastic**
Venue: - Dibbur,
Date: -20-04-2022, Wednesday
Time:- 03:00 PM – 05:00 PM
Mode:-Offline mode
Students of 4CSE 01,4CSE 02,4CSE 03, and 4CSE 04 of SOE has actively participated in the campaign, with faculty and student coordinators of ECPU and NSS they have visited many shops in Dibbur and distributed the paper bags that are been made and collected by the students of above-mentioned sections. They made the public aware of destruction caused by usage of plastic, the shopkeepers in the locality were requested to give up the use of plastic bags, The banner saying the negative impacts of plastic was displayed. **Head Student coordinator of ECPU Sunkara Prem Kumar Reddy and Student coordinator of NSS Ashutosh had led the team**. The campaign was a great success. People of that locality has given the positive feedback and students of different sections has said that they had great experience outside the campus, and they were happy for the good work they did.

REGISTRAR

Flyer: -

Figure 16: Environmental Cell of Presidency University (ECPU) in Collaboration with NSS club

Environmental Cell Presidency University

REGISTRAR

:

REGISTRAR

PRESIDENCY UNIVERSITY Registrar BANGALORE