ENVIRONMENT AUDIT REPORT

2021-22

SUBMITTED BY:
International Institute of Waste Management

SUBMITTED TO:
Presidency University
Itgalpur, Rajanakunte, Yelahanka, Bengaluru
560064 Karnataka, India

December 2021

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Environment Audit Report

Name of the Institution	**Presidency University**
Details of the Facilities Audited	Main University Building with the New Building, Green Cover, Sewage treatment plant, University infrastructure
Period of Audit	2021-2022
Audit Completion Date	October – 2021
Report Submission Date	December - 2021
Name of the Auditing Agency	International Institute of Waste Management
Document Control	Draft: 1. IIWM project staff 2. Key personal of Presidency University Final: For circulation and public domain. Information to be acknowledged with credit to PU, and IIWM

Environment Audit Certificate

This is to certify that the International Institute of Waste Management, Bangalore has conducted Environment Audit of the Presidency University (Autonomous), during the period 2021-22. The data collection was undertaken in collaboration with the Audit team of the University as per the Standard Auditing process.

P.Bineesha
Executive Director, IIWM
December 2021

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INSTITUTION DATA AT A GLANCE

Name of Institute:	**Presidency University**
Date of establishment: (YEAR OF ESTABLISHMENT)	2013
Full Address	Presidency University Itgalpur, Rajanakunte, Yelahanka, Bengaluru 560064 Karnataka, India
Population strength (2019-2020)	Day scholars-11136 Residential students-NA Floating population-145 Total teaching faculty members- NA Management and support staff-180
Total sanctioned (approved) student intake	12000
Type of institute	Unaided – Private
Type of program	Engineering, Law, Management
Departments/faculty that come under the institute	Civil, Chemistry, Computer Science, English, Electrical& Electronics, Electronics &Communication, Learning &Development, Law, Kannada, Management, Mathematics, Mechanical, Physics, Petroleum, Design, Commerce and Economics
Total area of the institute	64 Acres
Total built-up area	25.6 Acres

Details of Built-up area

Total built-up plinth area	**1476000**

Details of Open area

Particulars	**Sq. Ft.**
Foot Ball Ground(Proposed)	4358
Volley Ball Court-(Proposed)	3960
Basket Ball Court (2) (Proposed)	9716
Garden cum Students Canteen	15456
Garden 1	14563
Garden 2	19740
Garden 3	1937
Garden 4	1657
Garden 5	3993
Tar Road	49065
Garden 6	1872

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EXECUTIVE SUMMARY

International Institute of Waste Management (IIWM) was assigned an audit work through a work order, vide PO: PU PD 238/2021-22, by The Presidency University, Bangalore, on 8th October 2021 to support the campus in conducting an Environment Audit of the campus and submit a report. An initial basic audit as per the guidelines was undertaken in the month of October 2021 by IIWM team along with Presidency team. This audit report and executive summary is based on the observations of the field team and subsequent analysis of the data collected.

Exclusions and Limitations

As a separate detailed Energy Audit and Climate Change component (Green Audit) was carried out, these aspects are reported only as cursory input in this Audit Report. The University is currently setting up structured system for capturing detailed environmental data and hence, this report does not include detailed analysis and trends as this is the first report of this type.

This report will also form the basis for the Green Campus Rating in future for the University, if the University wishes to be rated under the AICTE Green Campus Certification for the year 2021-22. The current report is not part of the AICTE Green Campus process.

Environment Audit Process

This report focuses on four major environmental criteria – Water, Waste, Wastewater and Biodiversity, covering the range of significant Impacts. For each indicator, a benchmark was established to evaluate the University's overall performance. These benchmarks are taken as per the Green Campus Guidelines developed by IIWM for AICTE but were occasionally adapted to be more relevant to Presidency University.

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 Presidency University'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.

Environment Audit Summary

The focus of this report is the implementation of measures adopted in establishing Eco-Infrastructure and in addressing the specific issues identified during the current audit year:

Water Conservation		**Waste Management**		**Wastewater Management**		**Bio-diversity Conservation**	
Current Practice	Desirable	Current Practice	Desirable	Current Practice	Desirable	Current Practice	Desirable
No Rainwater Harvesting or Recharge adopted in the campus. Source of water for the campus is through ground water exploration – 6 borewells (3 non functional – dried up) supply the required water for the campus.	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	Solid Waste: Colour 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.	Sewage Treatment Plant installed but not operational for 300 KL/D. Deficit of 250 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	Campus has about 40% green cover, which is more than the benchmark required.	Indigenous species to be encouraged and the percentage of indigenous plants to exotic plants to be increased. Herbal garden to be incorporated in the campus.

Water Conservation		Waste Management		Wastewater Management		Bio-diversity Conservation	
Current Practice	Desirable	Current Practice	Desirable	Current Practice	Desirable	Current Practice	Desirable
	sites more than 60X40 feet).						
Reverse Osmosis for drinking purpose is installed and the reject is let into drain	Reject of Reverse Osmosis to be treated and recycled	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	No plan for the proposed sludge removal from the STP planned.	Utilization of Sludge from STP withing the campus to be undertaken	Campus has not capitalised on the abundant green cover.	Student projects on the herbal or biodiversity aspects and climatechange aspects for the green cover to be undertaken Explore DST funding for research projects
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						

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Water Conservation		Waste Management		Wastewater Management		Bio-diversity Conservation	
Current Practice	Desirable	Current Practice	Desirable	Current Practice	Desirable	Current Practice	Desirable
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.						
Water meters not installed	Water meters with data capture using cloud computing to be installed. This is also as per the AICTE SMART aspects implementation	Hazardous/Toxic Waste: Identification and listing not undertaken	Incineration of Sanitary Napkins to be undertaken. Inventory of all HW in the campus to be done			Floral and faunal species diversity recorded and maintained.	Develop greenery which increases the biodiversity in the campus.

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INTRODUCTION

International Institute of Waste Management (IIWM), jointly with All India Council for Technical Education (AICTE), has been promoting the concept of 'Green Campus' to inculcate the sustainable value systems among the students, so that they carry the learnings and practices by them in their future endeavours. This will ensure that Sustainability and Environmental practices get embedded in all the institutions and organizations in the country.

What is Green Campus?

A Green Campus is a place where environmentally friendly practices and education combine to promote sustainability in the campus which ultimately offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social, and economic needs of the mankind. This can be achieved by sweeping away wasteful inefficiencies and using conventional sources of energies for its daily power needs, correct disposal handling, purchase of environment friendly supplies and effective recycling program. Institute has to work out the time bound strategies to implement green campus initiatives. These strategies need to be incorporated into the institutional planning and budgeting processes with the aim of developing a clean and green campus.

OBJECTIVIES

The main objectives of Green Campus Audit are to assess the environment management and sustainability concepts practiced in the University campus. The Specific objectives of 'Green campus' audit are:

- To systematically identify the environmental aspects and components within the campus
- To quantify, record and analyse the identified aspects and components of environmental diversity of the campus.
- To deduce the impact of the environmental practices caused within and outside of the concerned campus.
- To establish baseline data or compare the past trends and predict future impacts
- To recommend possible measures for improvement and highlight best practices

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METHODOLOGY

The methodology adopted for this Green Campus Audit has been as follows:

Pre-Audit meeting	A meeting of the Key Personnel of the campus was undertaken in the presence of the key personnel on **17th October 2021**. The audit process was explained and a plan drawn-up for scoping visit of the campus.
Field study of the campus	A scoping study to identify key environmental aspects of the campus was undertaken the following weeks of October. The components were discussed with Dr.Bhadri, Co-ordinator for Campus Audits.
Analysis of data	The data provided was analysed by IIWM and a checklist for physical verification was prepared
Presentation of the findings	The audit findings were presented to the Audit Evaluation team of the Presidency College on 7th December 2021.
Report preparation	The fianlised recommendations discussed with the Presidency management is incorporated and the audit report prepared and submitted on 10th December 2021.

Physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations were the process adopted in the process of audit report preparation.

SCOPE OF WORK

The study covered the following area to summarize the present status of environment management in the campus.

- Water conservation aspects of the campus
- Waste management and other resource conservation of the campus
- Wastewater/ Sewage Treatment and Recycling within the campus
- Biodiversity enhancement within the campus

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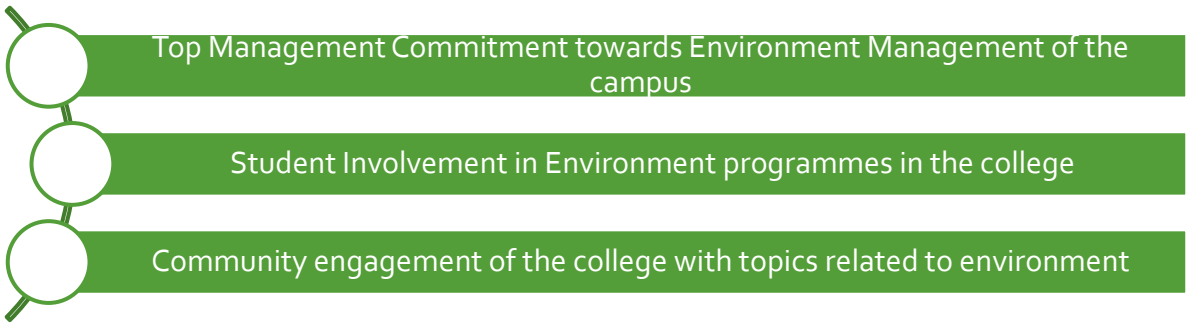
The Audit Framework also examined other 'Soft' aspects of the Greenness of the Institution, which are as follows:



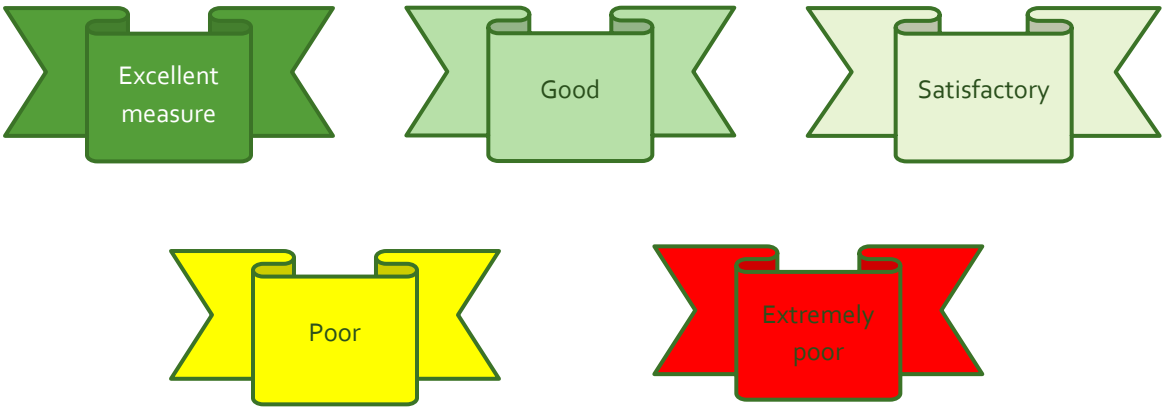
APPROACH ADOPTED FOR THE REPORT

This Environment Audit Report is prepared by examining all the data provided by the University and physical verification of the data where ever possible. The analysis is interpreted in the Environment framework and reported under each of the above aspects delineated. A summary of the report and recommendation for further improvement is provided in the end of the report.

The Soft aspects of the Environment Audit is discussed in the initial chapters and in the later chapters the audit aspects of water, waste, biodiversity, energy etc., is discussed.

The result and observations are flagged as audit findings in each of the chapters. The findings are highlighted as follows in each chapter:

The Colour of the ribbon is indicative of the green measures the University is adopting. If the measure is very good, the Colour will be dark green. The Colour deteriorates to lighter shades and turns yellow to orange to red depending on the problem areas.



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MANAGEMENT COMMITMENT TOWARDS ENVIRONMENT – ASPECT -1

ABOUT THE CAMPUS

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 offers courses in engineering, management, design, computer applications, commerce and law. The University established in 2013 and commenced classes in 2015.The University is recognized by the University Grants Commission (UGC).

VISION AND MISSION STATEMENT

VISION

To be a value-driven global University, excelling beyond peers and creating professionals of integrity and character having concern and care for society

MISSION

i. Commit to be an innovative and inclusive institution by seeking excellence in teaching, research and knowledge transfer.
ii. Pursue research and development and its dissemination to the community at large.
iii. Create, sustain, and apply learning in an interdisciplinary environment with consideration for ethical, ecological, and economic aspects of nation building.
iv. Provide knowledge-based technological support and services to the industry in its growth and development.
v. To impart globally applicable skill-sets to students through flexible course offerings and support industry's requirement and inculcate a spirit of new venture creation.

Analysis of the Vision and Mission Statement under the framework of the Environment Audit. Although there is no direct mention of a green reference in the Vision Statement, the allusion on 'care for the society' can be considered to point to Green commitment by the college. Nevertheless, the mission statement iii, has a clear commitment towards creating ecological aspects in the campus, which is commendable.

The University does not have a Green Policy or Eco-policy. As per the AICTE mandate, the University has to develop an Eco policy in line with AICTE Environment Policy and display it in the campus.

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STUDENT INVOLVEMENT IN THE ENVIRONMENT PROGRAMMES OF THE CAMPUS- ASPECT 2

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.
- Most of the programmes are short term events.
- There are no feedback analysis to verify whether the awareness levels of the students have increased due to such campus programmes, 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

COMMUNITY ENGAGEMENT OF THE UNIVERSITY WITH TOPICS RELATED TO ENVIRONMENT – ASPECT 3

No community engagement activities with environment focus carried out by the University.

The Enviro Club to immediately plan community engagement activities related to Environment

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WATER CONSERVATION MEASURES

The water source for the campus are Six bore wells (more than 1000 feet). The campus has not undertaken Rainwater harvesting measures, which is a violation of law of the land. For safe drinking water, Reverse Osmosis plants are installed in the campus (data of the number of plants not available). The RO reject water is let into the drain. Currently no wastewater recycling is practiced. The water consumption per day in the campus, as per the data provided by the University is 640 KLD. However, the calculated consumption as per the population of the campus and the NBC guidelines for institutions percapita water consumption is 45 liters, is estimated to be 5418 Kilo litres per day. As there is no system of recording the water consumption in the campus through metering, this lower consumption data cannot be classified as good practice of conservation measures.

The total water consumption benchmark for a campus without residential students staying on the campus, is considered to be 45 litres per day per person. The consumption of water in Presidency University Campus for the year 2021-22 is found to be 69% lower than the benchmark.

Water conservation measures by way of plastic tags fitted to taps to reduce the flow is adopted.

However, none of the above data is verifiable due to absence of metering.

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WASTE MANAGEMENT

The Waste Generated from the campus has been estimated as 75 kilograms per day with a per capita waste generation of 6g per day. At present there is no proper waste management facility in place and the waste generated is being handed over to the municipality on daily basis. Following observations have been made by the audit team:

- The quantification of waste is not practiced.
- Segregation of waste is poor. Although the campus has provision for collection and storage of segregated waste, the waste is mixed at source itself.
- The housekeeping activity is outsourced to a private agency. Sweeping and cleanliness of the campus is undertaken by this agency. Timely collection and emptying of the dustbins is undertaken. However, the segregation of waste, pre-treatment or scientific disposal of waste is absent.
- The temporary storage of waste in the campus is poorly managed.
- No inhouse treatment or recycling of waste practiced in the campus.
- No explicit paperless policy adopted
- Poor management of hazardous waste generated within the campus, like the waste oil rags from the generators, laboratory waste, pesticide cans used in the gardens etc.,
- E-Waste management system not established

A few photographic evidences of the state of waste management in the campus is given below:

The total waste generation benchmark for a campus without residential students staying on the campus, is considered to be 0.05 kgs per day per person. There is no clear quantification of waste generated in the college. Immediate action needs to be taken for quantification of the segregated waste.

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WASTEWATER MANAGEMENT

The wastewater generated in the University campus is proposed to be treated in campus and the treated water is proposed to be used for watering of garden. As per the information provided by the University, a 300KLD STP is installed, but is not commissioned and the wastewater generated is being drained out into the public sewers. However, this 300 KLD is not sufficient to treat the 550 KLD sewage estimated to be generated in the campus. Hence, there is a gap of 250 KLD, which is untreated 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 litres per day per person.

STP is installed, but not operational. Recycling of treated water is also proposed. Recycling of treated water is also proposed.

BIODIVERSITY ENHANCEMENT

The campus is home to variety of indigenous and exotic plants and trees. Every year new varieties of plants and trees are being planted and nurtured. There is a dedicated horticulture department managing the green cover of the campus. A well-documented list of flora and fauna exists in the campus. There is a very good practice of having green cover within the building spaces, enhancing the aesthetics of the campus. The complete list of plants have been attached as **Annexure 3.** Total campus area is 64 acres, out of which the green cover is about 25 acres (including lawns)

The benchmark for best green cover is atleast 30 percent of the campus area. This campus boasts a whooping 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.

OTHER ECO-FRIENDLY MEASURES

ENERGY CONSERVATION

Equipment such as projectors, computers and printers are procured after assessing energy ratings provided by the manufacturer. Computer monitors have been upgraded from CRT to LED in most of the laboratories. Desktop computers provided for faculty members are LED with inbuilt CPU. Usage of CFL bulbs, air-conditioners and refrigerator with energy saving features is in place within the campus. 75% of the total lights installed in the campus are LED. The campus consumes 582460 Units of power annually, which is 57.44 Units per capita consumption of energy per year and per unit area is 4.44 Sqm, which is extremely good. However, it is important to note that this figure is for the years in the campus when the students have not been on the campus for most of the time, due to COVID restrictions. The world benchmark for lowest energy consumption data for a good University campus following best practices is in the range of 71.34 units/ Sqm in a year. This is for an University campus which has multiple departments operating full time and with heating and cooling facilities depending on seasons.

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GREEN PROCUREMENT

Currently there is no policy in the University for green procurement. However, there are efforts already made by the procurement team to look at conservation of energy and other green parameters and has been conscious in considering the environment while making major procurements.

AIR POLLUTION MITIGATION

The University encourages the students to use public transport. No vehicle movement is allowed within the campus, except for goods and service movement occasionally. The parking of staff and students' vehicles is allowed at a designated space within the campus near the entrance gate. Hence, air pollution due to vehicular movement is negligible. Paved roads and vegetation help in reducing dust pollution to a large extent. Burning of waste within the campus is strictly banned.

RECOMMENDATIONS

Management Commitment	•University to immediately develop Environment Policy for the campus. The methodology to be followed is as per the AICTE and UGC norms. Additionally, "Infrastructure and maintenance Policy" – which states that – "Utilisation of renewable energy resources by harnessing rainwater and solar energy and sewage water treatment", "Aim for zero percentage wastage through effective wet and dry waste management", "Create and maintain a green certified campus", etc to be undertaken. A "Green Procurement policy" and "Paperless policy for certain areas of the University" needs to be developed and should be displayed appropriately in the campus and also in the website.
Student involvement	•Involvement of Students in Eco-Infrastructure projects to maintain the colleges infrastructure and evaluating the existing infrastructure should be undertaken
Community Involvement	•The community programmes should be designed which is long term, which should see the physical changes in the villages which are tangible and carried out by different departments with same thread. For example, Water conservation activity in the village for three years with clear target of increasing the water harvesting area and structures in the village. The results can thus be physically measured.
Water conservation	•Mandatory Rain water harvesting infrastructure to be undertaken on top priority. The water harvesting structure installed should have a water level meter installed. A water audit spreadsheet should be maintained by the college with clear target set annually for conservation measures. •Taps in the toilets should be replaced with air pressured water conservation measures.
Waste management	•This sector is the weakest in the campus. Needs special attention immediately. •The C&D waste removal from the campus to be undertaken immediately •Composting/biogas of food waste from the canteens to be undertaken •No single use plastic within the campus to be made as a policy in the campus. Boards banning single use plastic to be displayed in the campus in prominent places •Weighing machine with segregation of waste, which is digitised to be installed in the college. This will enable the college to adhere to the 'Smart and Clean campus' parameter . This will also capture the various waste streams of the campus like E-Waste, Recyclables like glass, rejects, organic waste etc., on a real time basis and help in setting targets for reduction. Resource efficiency can be proven using this measure
Wastewater management	•Recycling of the treated water should be undertaken. •Installation of DTS (decetralised wastewater treatment system) for the standalone new buildings to be undertaken.

Bio-diversity conservation	•A dedicated herbal garden to be developed •Increase the indegeneous variety of flora in the campus •Leaf litter composting and reduced use of chemical fertilizers and pesticides for gardening should be undertaken. Organic measures to be adopted
Energy Management	•Newer buildings to be constructed to be made according to Green Building concepts •Any new infrastructure to be added to follow the guidelines of green material management

WAY FORWARD

A meeting with IIWM and key management staff of the University to be convened to draw up a step by step implementation/ action plan for the University to implement the measures suggested by IIWM. A list of action plan with short term, medium term and long term implementation to be chalked out in consultation based on the above recommendation.

A possible recommended action plan with bifurcation is provided below for consideration:

Short term/immediate actions:

- **Waste Management actions to be implemented with a special action programme.**
- Environmental policy to be drafted
- Website to have the eco-infrastructure write up and photographs
- Infrastructure which can make the campus a SMART campus like water meters, Smart weighing machine for solid waste which has cloud computing,
- No single use plastic campus programmes to be introduced as part of Enviro-Club activity

Medium term actions:

- Wastewater recycling provision, installation of DTS for newer blocks
- Replace the current water faucets and taps with water efficient taps.
- Eco entrepreneurship development programmes to be undertaken within the campus

Long term actions:

- Targets for community engagement to improve villages through partnership programmes

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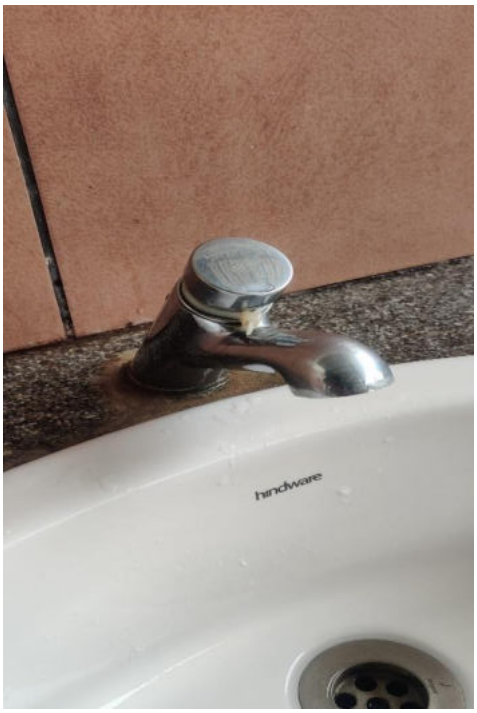
Waste Management

Dog in the Intermediate Waste Storage Area

Although waste segregation is undertaken, it is mixed during collection and dumped in the storage area



Plastic tag to conserve water in taps

Water saving messages – good awareness practice

C&D Waste disposed in the gardens

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Segregated Hazardous Waste Storage at laboratory

Colour coded
Waste Storage bins at cafeteria

Mixed waste, wrong labelling, banned plastic liner used

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Drip irrigation system for water conservation practiced

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