

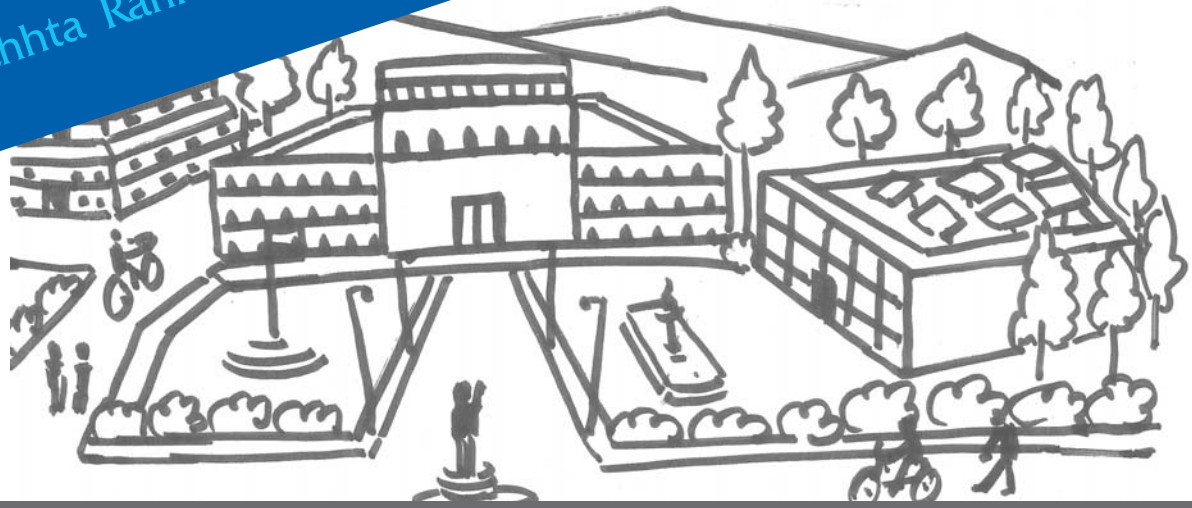


सत्यमेव जयते

Government of India
Ministry of Human Resource Development

Swachh Campus

A manual for Swachhta Ranking of Higher Education Institutions



Mahatma Gandhi National Council of Rural Education

प्रकाश जावडेकर
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मंत्री
मानव संसाधन विकास
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MINISTER
HUMAN RESOURCE DEVELOPMENT
GOVERNMENT OF INDIA



MESSAGE

The Government has recognised and accorded top priority to Swachhta, or hygiene in our basic lives as the critical necessity to not only improve our living environment, but also to elevate our thinking to a more pure and healthier state. In modern India, with our huge population base and varying education & awareness levels, securing a hygienic environment is a major challenge. Lack of hygiene inhibits the country's progress to global benchmarks in all spheres. While adversely impacting investment, tourism and all economic activities, it also directly impacts the health of our working population and creates unhealthy mindsets in the people. A clean or Swachh mind emanates from a Swachh environment and this is an ancient truth.

Teachers and students of the education system need to play the lead role in making the masses aware of the quintessential need for hygiene. I am happy that the Department of Higher Education has decided to embark on the mission through this Standard Operating Procedure on Swachhta for its institutions, setting forth practices that must be implemented in all higher educational institutions. I would exhort all institutions to meticulously follow the parameters of campus hygiene laid out in this manual so that the minds of the students flower in a clean and pure campus atmosphere. Along with education, Swachhta is the most precious lesson that can be learnt in an educational institution, as it defines their personalities.

I congratulate the Mahatma Gandhi National Council for Rural Education for having brought out such a useful guide for the higher education system in one of the most crucial aspects of Indian living.

(PRAKASH JAVADEKAR)



V.L.V.S.S. Subba Rao
Senior Economic Adviser



सूचना का
अधिकार



PREFACE

In keeping with Government priorities, the Ministry of HRD has been undertaking measures to institutionalise cleanliness, or Swachhta, as an integral part of the functioning of educational institutions in the country. Higher Educational Institutions will now be expected to set the tone and pace for the Swachhta movement in the country, with their huge outreach and knowledge base.

The Swachhta Ranking exercise was first undertaken in year 2017, with the objective of generating peer pressure amongst educational institutions to first convert themselves into 'Swachh Campuses' and then spread the awareness and capacity to chosen off-campus habitations. The exercise served to galvanise higher educational institutions, first into introspection & appraisal of their campus cleanliness and then to stimulate corrective action to achieve higher benchmarks in hygiene.

In 2017, the exercise centred around certain basic hygiene parameters like student-toilet ratio, water availability & purity, hostel kitchen hygiene, garbage disposal frequency & techniques, campus green cover etc. Now a more substantive and qualitative evaluation framework has been designed that encompasses parameters relating to green campuses, utilisation of water & harvesting, solar energy and other aspects which have a direct bearing on the resource utilization efficiency in a campus. A higher educational campus will now be expected to transform itself into an example of environmental consistency, conforming to various factors of ecological balance, in its daily functioning. This Standard Operating Procedure (SOP) Manual on Swachh Campuses will be the model document for institutions to adopt and operationalise in a gradual manner, as the Swachhta Rankings of 2019 will be decided based on these parameters and templates.

V.L.V.S.S. Subba Rao

V.L.V.S.S. SUBBA RAO



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Foreword

Cleanliness is natural. Humans, animals, plants and all living beings thrive in clean spaces. Waste is the only misplaced resource in a man-made world. In a natural world, one creature's waste is another's resource. Thus, a detritus cycle regenerates resources to feed the ecosystem. Unfortunately, modern society has introduced many unnatural substances, for which nature immediately may not be able to help in cleaning up. It tries, but struggles. To clean up man-made mess, we need a man-made clean-up cycle. We also have the tragedy of commons in terms of the misuse of common property resources whether it is water bodies or forests or play grounds or parks or sea shores or river banks or campus areas. Where there is an ownership whether it is community or personal there is commitment to keep a place clean. This ownership and taking of responsibility are to be codified in the formal institutions. That is where a manual is required.

Technology

Every technology has its own by-product and the developer of technology will develop a method to deal with this by-product over a period of time. But the user cannot handle the by-products or waste. That is why there is an extended producer responsibility, with responsibility extending even to the end of the life of a product. This is slowly picking up in large products. But for small products like sachets or plastic packets it is difficult. This is where the consumer continues to be responsible with the use of the product and disposal of wastes.

Swachhta on Campus

“Swachh Bharat” campaign was launched by the Government of India to create this system of maintaining cleanliness 24/7/365 and enlivening this spirit in the communities and individuals. Campuses of educational institutions have different and difficult types of wastes like those of health centre waste, furniture waste, building waste, food waste, kitchen waste, lab waste, office waste and hostel waste. Campus is a mini community. It is a mini village. Those in the campuses of educational institutions stay there for learning and hence inculcation of Swachh habits is a duty of these educational institutions. Habit inculcation is possible through experience and practice.

A manual on Standard Operating Procedures

Standard Operating Procedure (SOP) manual identifies the responsibility of the persons and indicates the processes of waste management. This SOP manual on Swachh Campus is for supporting this task of promoting cleanliness on the campus and promoting a culture of taking responsibility to keep the campus clean through continuous monitoring and practice. This is expected to become a habit when the student reaches his home. Our behavioural expectations at home, from self as well as neighbours will get shaped and modified accordingly. Swachh Campus initiative builds not only community hygiene but also public health in over 6,55,000 villages. Most of our higher education students are from these villages. These students impact their home, neighbourhood and work place later. It is in this context, Swachh SOP manual is prepared at the instance of the Higher Education Department in the Ministry of Human Resource Development, Government of India by Mahatma Gandhi National Council of Rural Education (MGNCRE).

Dr. W.G. Prasanna Kumar
Chairman MGNCRE

Acknowledgement

"Aano bhadra kratvo yantu vishwatah. (Let noble thoughts come to us from all directions.)" - 1.89.1, Rig Veda

Leadership

This manual, encompassing Standard Operating Procedures (SOP), is designed for easy adoption and successful adaptation by Universities and the Higher Education Institutions (HEIs) across India, to suit individual institutional conditions. This manual is the result of the great encouragement given by Sri R Subrahmanyam IAS Secretary Higher Education MHRD as well as continuous interest, direction and support given by Sri VLVSS Subba Rao, Senior Advisor Higher Education MHRD.

Consultations

It is based on a draft circulated and critiqued as part of deliberations at a two-day intensive Workshop conducted by Mahatma Gandhi National Council of Rural Education (MGNCRE) in Hyderabad during June 25-26, 2018. The participants included key faculty members from Indian Institutes of Technology, National Institutes of Technology, Central Universities and State Universities. It proposes to nurture student volunteers who are keen on contributing their mite to the national endeavour on building green campuses.

Consultation Team

In this regard, MGNCRE is grateful for the fruitful exchange of ideas and wonderful cross-fertilization that took place at the workshop with the support of Dr Dinesh Chahal Central University of Haryana, Dr R Pramila Central University of Tamil Nadu, Prof P K Sharma Banaras Hindu University, Dr Vivek Singh Rajiv Gandhi University Arunachal Pradesh, Dr Efhikar Ahmed Central University of Kerala, Mr Anupam Pal National Institute of Technology Agartala, S K Rai NIT Durgapur, Dr. Hirok Choudury NIT Durgapur, Dr Govardhan Bhatt NIT Raipur Chhattisgarh, Prof. AJ Saha SVNIT Surat, Dr Amritha Bhide NIT Puducherry, Dr P Venkateswara Rao NIT Telangana, Dr Smita Jha Indian Institute of Technology Roorkee and Dr Snehasis Chowdury Indian Institute of Technology Bhubaneswar.

Internal Team

MGNCRE faculty and team members who distilled this manual from the workshop proceedings and outcomes for this Swachh Campus SOP Manual include Murali Ramaswamy, Archana Waran, Padma J, Archana Sonti, Anasuya V, Dr. K.N. Rekha, Dr DN Dash Assistant Director, Major Shiv Kiran and G. Vani Jagadishwari.

Introduction

“Earth provides enough to satisfy every man's needs, but not every man's greed.”

- Mahatma Gandhi

Path to a Swachh Campus

A green campus, be it in school, college or university, is no longer a fad, but a clear mandate in India and several other progressive nations where environmental awareness is growing by the day. In simple terms, a green campus aims to make environmental awareness and action an integral part of the life and ethos of those administering, learning or teaching in a school, college or university.

As per the University Grants Commission's notification: “A green campus is a higher education community with optimum land use, environmental planning and resource management i.e., improving energy efficiency, conserving resources, enhancing environmental quality including habitat preservation, healthy living environment, use of renewable energy and management of wastes and water recycling. The buildings within the campus should be based on green building concepts to the extent possible.”



Green Initiatives

The Swachh Campus Initiative, envisaged by the Department of Higher Education in the Ministry of Human Resource Development of Government of India (MHRD) for Higher Education Institutions (HEIs) and

Universities, mirrors the principles of green institutions and endeavours to extend learning beyond the classroom to inculcate and develop responsible attitude, habits and lasting commitment to Swachhta, be it at home, on the campus or in the wider community.

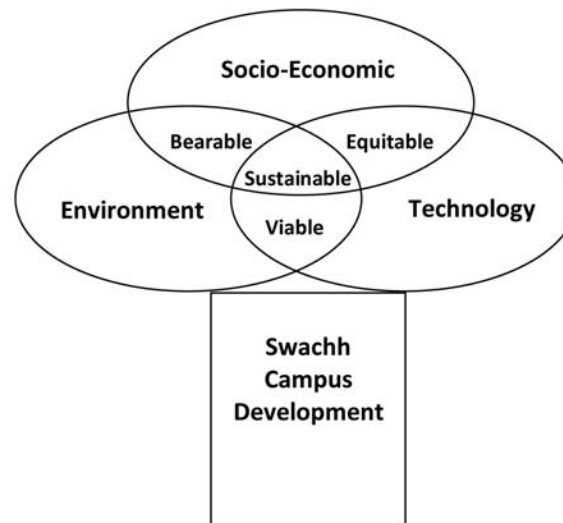
The Team

Short-term studies of best Clean and Green practices followed in exemplary institutions have been portrayed to serve as guideposts. These practices include -- Sanitation and Hygiene, Waste Management, Water Management, Green Cover and Energy Conservation. In all, 25 institutions, representing both technical and non-technical streams of education, were involved in consultations and pilot studies.

The MGNCRE has constituted a core work group to prepare guidelines for this initiative. Experts have been consulted to identify a bouquet of key interventions that can be used by HEIs and Universities on need basis.

“Environment -
We have not
inherited it from
our forefathers!
We have
borrowed it from
our children.”

– A Native
American Proverb



Why Sustainable Development?

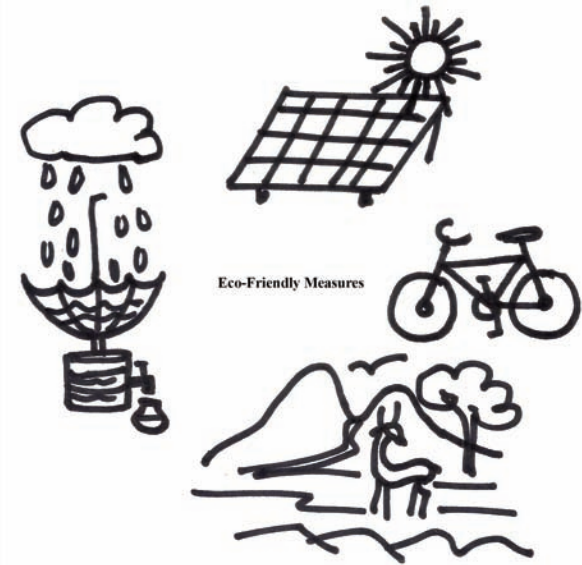
*S*ustainable development on our campus involves much more than simply reducing the impact our campus has on the surrounding environment. We must strive to cultivate a robust community that supports the wellbeing of everyone who passes through our portals, even as we pursue our broader missions of research and teaching.

Campus Efforts

Studied and concerted efforts are required in one or more of the areas impinging on environment, either sequentially or simultaneously, for a campus to attain the coveted green status that presently is referred to as "Swachh" campus under the larger Swachh Bharat mission. The overarching goal of this effort is Swacchta, regardless of whatever steps are adopted specifically on each campus.

World Over

Around the world, the trend is to *inter alia* adopt cycling for local transport, water harvesting, biodiversity and solar energy to make campuses eco-friendly, green and self-sustainable. India too is in the race. **We have a lot to do. Now!**



Who should Do it?

Everybody in and around our campus should do it....Yes everybody should. Higher education institutions have a fiduciary duty to contribute their mite to have long-term impact on our communities and help achieve sustainability across our campuses. For this, we have a large pool of researchers, intellectual capital and tremendous resources at our command.

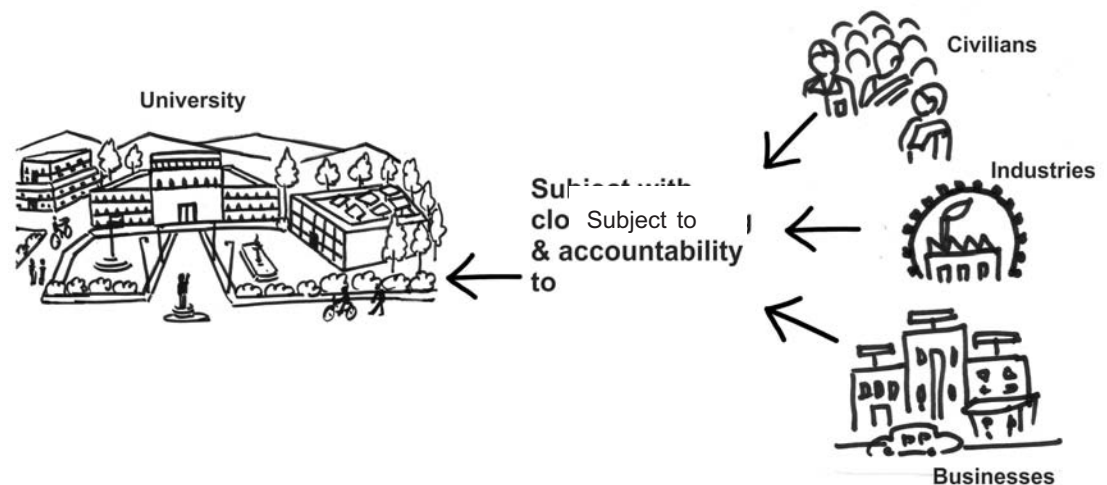
An Across-the Board Initiative:

Swachh Campus Initiative is a pan-India effort. As per the University Grants Commission (UGC), there are 822 Universities in India, including 47 Central Universities, 370 State Universities, 123 Deemed Universities and 282 Private Universities. Additionally, there are 23 IITs, 31 NITs, 23 IIITs, 7 IISERs, 7 AIIMS, 7 NIPERs, 3 SPA and 25 other institutes of National importance. Apart from this, we have over 100 institutes offering courses from Agricultural, Horticulture and Veterinary Universities, which are controlled and administered by the Indian Council of Agricultural Research (ICAR). All these Universities and Institutes have huge campuses and house a large number of faculty members and students. Apart from this, thousands of Higher Education Institutions across the country need to turn into Swachh Campuses. The Swachh Campus Initiative covers all these institutions.



How Higher Education Institutions and Universities can Do it

Higher Education Institutions (HEIs) enjoy tremendous autonomy in terms of all their internal affairs. They are virtually insulated from most of the day-to-day regulations to which civilians, businesses, industries and others are subjected to with close monitoring and accountability. This prerogative of the universities, with the Vice Chancellor/Head of the HEI presiding over the system as the final authority, is the springboard to Swachh Campus. With the concept of Swachh Campus ingrained in the consciousness of everyone, unremitting efforts are required to be made by HEIs through faculty, staff and students to make action on cleanliness form one's second nature.



What all a Higher Education Institution or University can Do?

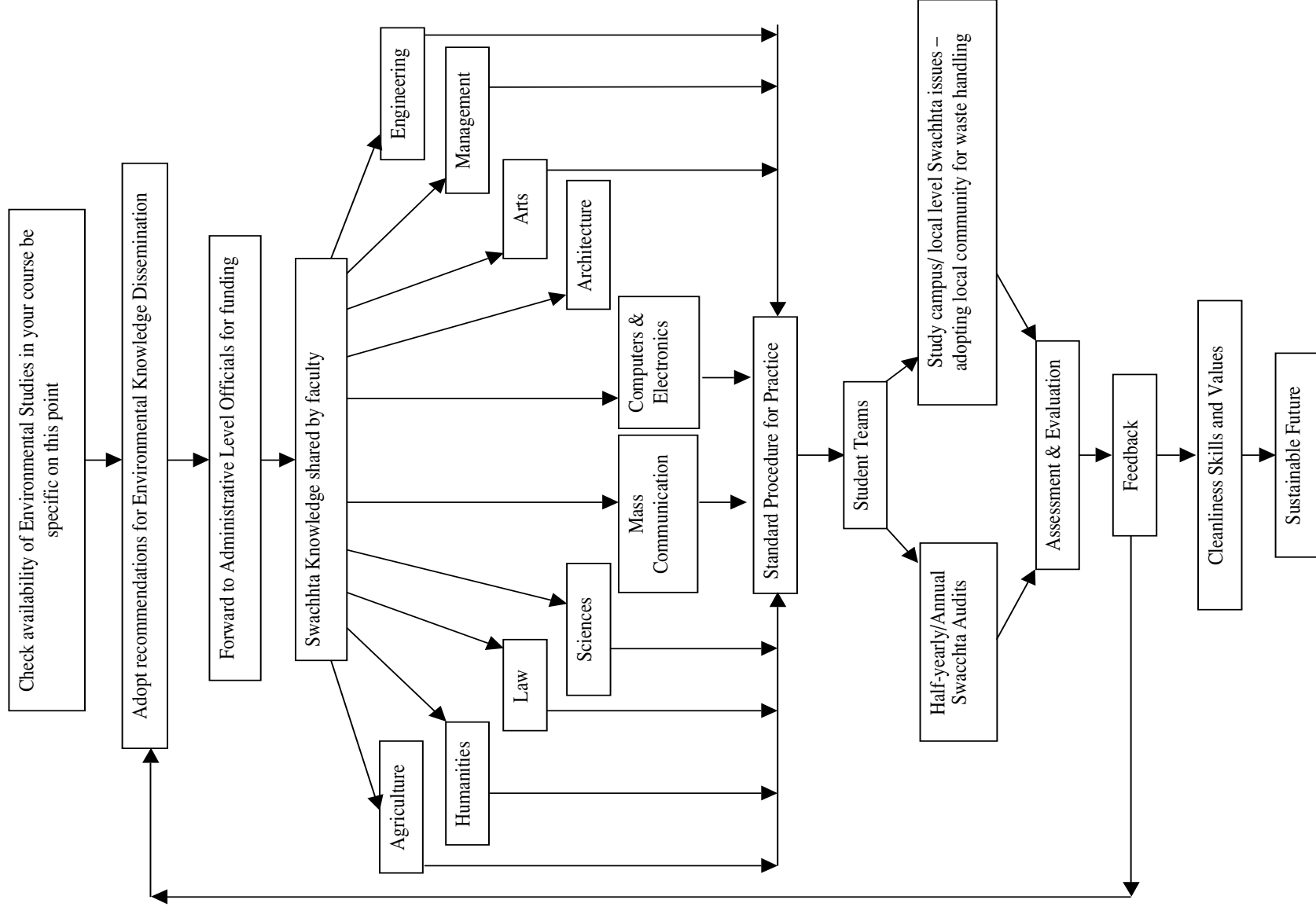
- i) Build consensus on the need for maintaining a Clean and Green Campus among campus leaders at student level, faculty level and campus level.
- ii) Facilitate design of specific interventions for making the campus clean and green by following international standards and accepted parameters.
- iii) Monitor the existing environmental performance of the campus in a participatory and transparent way.
- iv) Present a step-by-step guide for making the campus clean and green.
- v) Generate case studies on best Swachh practices adopted on the campus which can serve as models for other institutions to adopt.



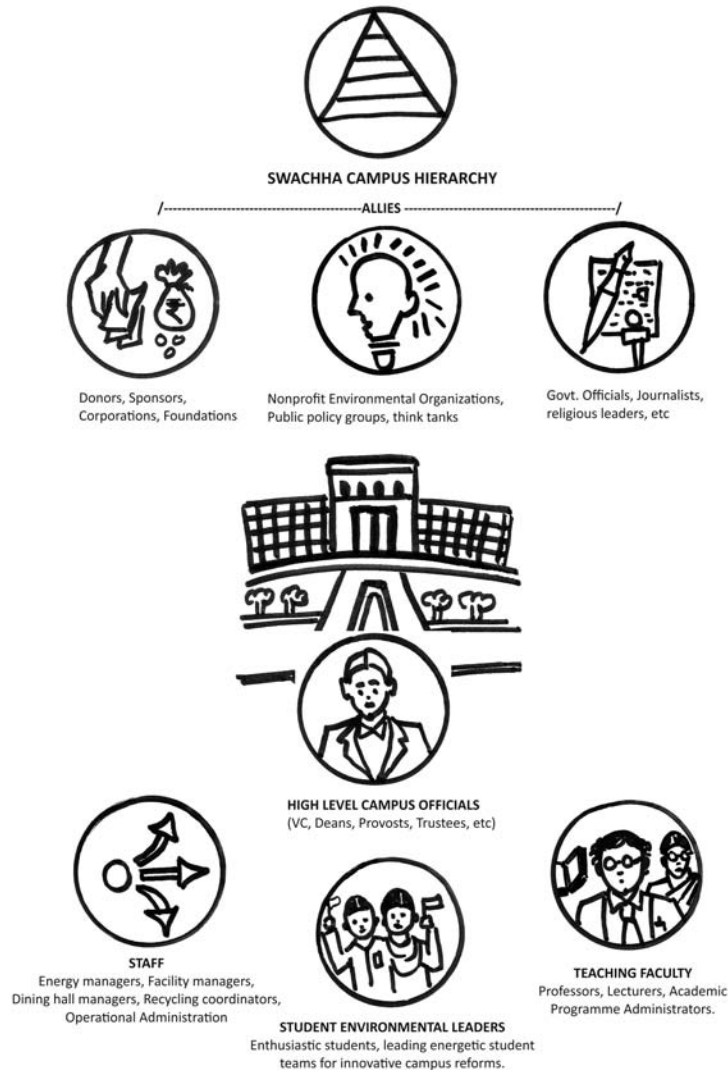
Attaining Critical Mass for a Green Campus

- A core team consisting of the leadership of the institution along with key stakeholders may be formed. The team shall work as **“Swachh Core Team”**.
- This team would be involved in all aspects of fact-finding, planning, taking action and recording. It will also include student teams, their faculty apart from administrative officials concerned.
- One or two interested or environmentally-inclined faculty members may be given the responsibility to helm the Swachh campaign in their departments. This team, henceforth named the **'Swachh Faculty'** will select a group of enthusiastic students from their own departments to be part of the core campaign team, here after called **'Swachh Student Team'**.
- Swachh faculty and Swachh Student Teams form **Swachh Monitors**.
- The Swachh Monitors will report to a team of campus officials representing accounts, administration and maintenance divisions, with an avid interest in the Swachh Initiative: **Swachh Admin Team**.
- The entire programme will run under direction from a **Designated Authority** that will set the policies, rules and directives for bringing change.
- **External Swachh Team Members** need to be identified from neighbouring colleges/universities. They monitor the progress at regular intervals and they conduct peer review.

Academic Involvement of Higher Education Institutions in Swacchta



Igniting the Spirit



Swachh Leadership

Swachh Campus Initiative can be a success only if the Head of the Institution ignites the spirit of everybody in the organization. S/he must direct the departments, pay attention to the findings of student teams and ensure that their valuable suggestions are followed in letter and spirit by all students, faculty members as well as administrative, non-teaching and support staff. A motivated leader can bring a sea-change in the system and therefore s/he is the cornerstone of this campaign.

An Advisory Committee may be constituted to guide the initiative.

How should we Go about it?

Vice Chancellors, Directors and Principals

- 1 Include a section in the academic mission statement to establish the credentials of the students in matters of sustainable and hygienic living. The wording can be “students, upon graduating, will possess the knowledge, skills, and values to work toward a sustainable future,” or such.
- 2 Provide resources to assign, hire and appoint expert faculty members and staff to lead such courses and projects.
- 3 Annual funding requirement and high investment initiatives will be met by higher officials as per the rules of the Institution.
- 4 Arrange a meeting of all the stakeholders and explain the performance and the outcomes expected out of the campaign for making the institution a 'Swachh Campus'. While explaining the plan of action, the roles and responsibilities of each stakeholder shall also be clarified.

Deans and Heads of Department

- 1 Incorporate Swachhta and sustainability aspects at relevant places in the curriculum. Raise campus awareness about the need for cleanliness and provide incentives for action, such as campus-wide “Ecolympics” competitions.
- 2 Share Annual Reports with members of the respective school or department on the campus community including staff, faculty, students, alumni, foundation donors, corporate donors, government officials, environmental leaders, community leaders and the public at large. They should be published on the Institution's website.
3. Meet annual funding requirements and propose high investment initiatives as per rules of the institution with approval of designated authorities



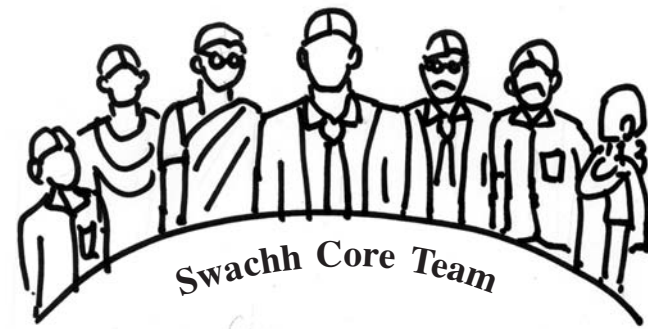
Registrar/Head of Non-teaching Staff

- Give a list of measures for a Swachh Campus to all employees. Conduct an orientation programme for all employees. Ensure all employees, including the outsourced ones, are contributing to the Swachh Campus Initiative.

Dean Faculty:

Provide resources for respective faculty to:

- integrate swachhta and sustainable development aspects and perspectives into their existing courses
- develop and launch faculty training programmes
- hold seminars on Swachhta
- include field work and demonstration in the teaching methods.



Dean of Student Affairs:

- Work with the counselling team in creating and implementing the orientation programme for first termers.
- Explain the rules to follow for a Swachh Campus.

Faculty Members (Professors, Associate professors, Assistant Professors and Adjunct Faculty)

Support the Swachh faculty as well as NSS coordinator in their initiatives

NSS Coordinator or a Designated Officer

1. Would head the Swachh team of all departments
2. Will look into overall aspects of Swachh Campus Initiative
3. Involve the NSS members in the Swachh Initiative
4. Survey the campus fortnightly
5. Conduct a surprise visit once a month
6. Motivate students for smooth conduct of the Swachh Campus Initiative

Building Maintenance Managers

Need to cover aspects of sanitation, water conservation, waste management, energy conservation and greenery.

Dining Hall/Canteen Managers

Need to maintain kitchen and food waste management and cleanliness

Research Associates

- Can introduce and deploy eco-friendly practices and technologies in their labs and research areas.
- Encourage other students to adopt these practices and technologies.

Residents of Campus

Support the campus initiatives even at their respective residences.

Commercial Firms

- Can have Swachh branding stamp for promoting their products.
- Can improve Industry's Swachh performance by helping recruiting trained students.

Non-profit Organizations

- Invite locally active, relevant NGOs to conduct awareness campaigns or connect external vendors, self-help groups in preparing the staff and residents of the campus for adopting Swachh methodology.
- They bring field experience in sanitation, water recycling, water harvesting, energy conservation and increasing green cover with appropriate trees.

Swachh Faculty Members

1. Introduce students to Swachh campaign on the campus.
2. Create interest in student community to volunteer.
3. Guide them in carrying out the campaign effectively.
4. Supervise the work done by the Swachh Student Team.
5. Put forth the creative ideas and recommendations of the students team to the campus management.
6. Work with the management and the students in implementing the Swachh Campus Initiative.



Swachh Student Teams

1. Carry out the survey/audit of the campus on identified nine aspects.
2. Analyse the effects of regular activities taken up in the campus on those aspects.
3. Sort out the alternatives for such activities that cause least damage to the surrounding environment.
4. In collaboration with the swachh faculty, present those solutions to the designated authority.
5. Persuade the designated authority to implement those alternatives.
6. Present the pros and cons of taking up the initiative.
7. Find ways in which they can implement the alternative solutions presented.

Swachh Organizations

- Assistance/guidance may be sought from Green Building Council, Municipalities, Local Bodies, Centre for Science and Environment (CSE) and Council on Energy, Environment and Water (CEEW).
- Workshops or camps on the protection of natural resources can be conducted by them.

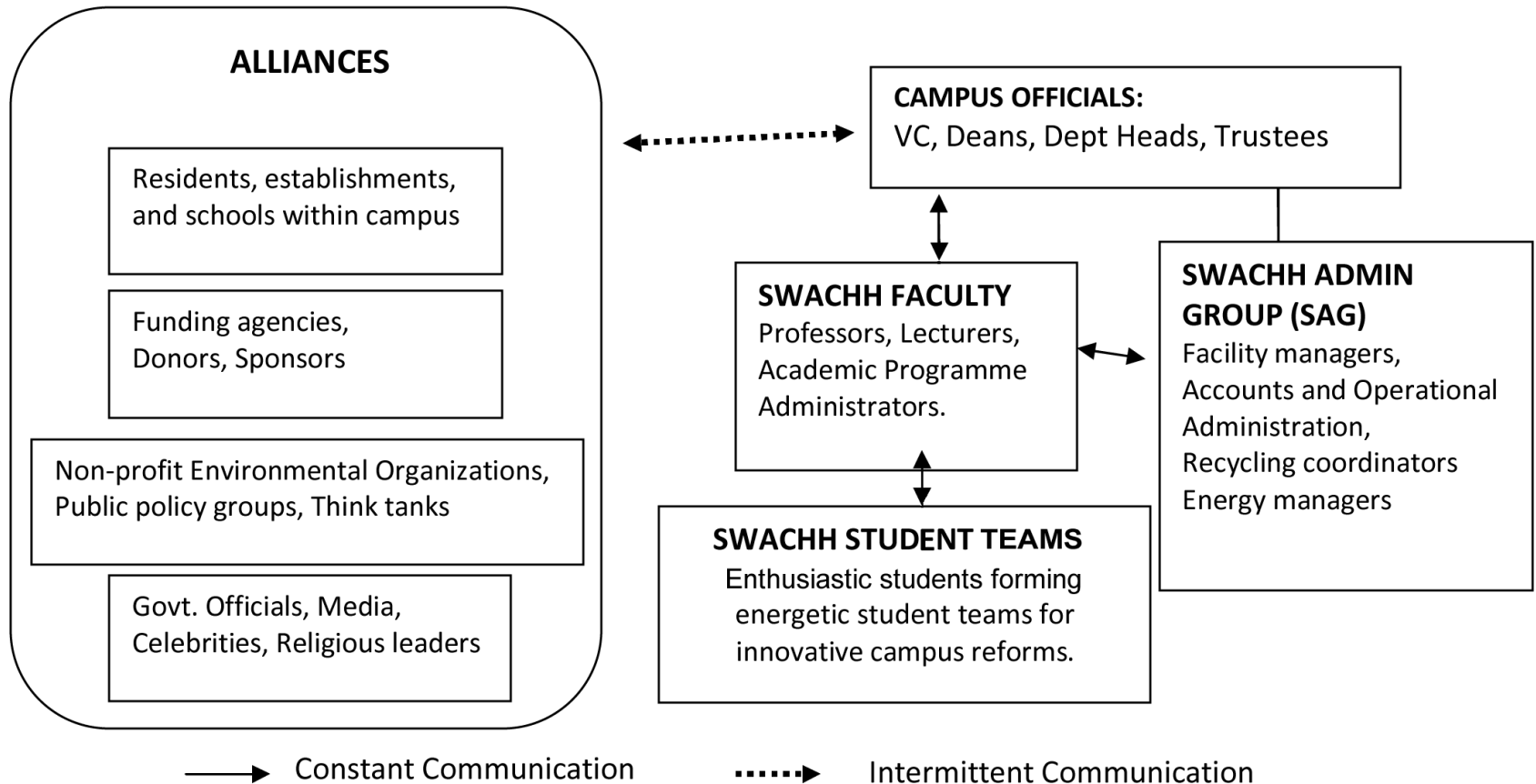
Partnering with other Institutions and Agencies

The campus is a fully functional unit but not a closed entity. It needs strong alliances to bring the dream of a Swachh Campus to fruition. Some of the alliances that support the endeavour are

- 1 Funding Agencies:** State and central regulatory and finance agencies and ministries like HRD, water resources, sanitation, forests and environment as well as AICTE.
- 2 Donors:** Alumni, NGOs, private foundations and corporate houses.
- 3 Non-profit Organizations:** Awareness campaigns for connecting to external vendors and self-help groups.
- 4 Public Policy Groups and Think Tanks:** Assistance/guidance may be sought from Green Building Council, Centre for Science and Environment (CSE) and Council on Energy Environment and Water (CEEW).
- 5 Media and Celebrities:** Long-term collaboration with media and celebrities to mobilize the campus residents.
- 6 Government:** The campus can benefit from relevant government schemes making them a part of the campaign for Swachhta.



Networking for Swachta

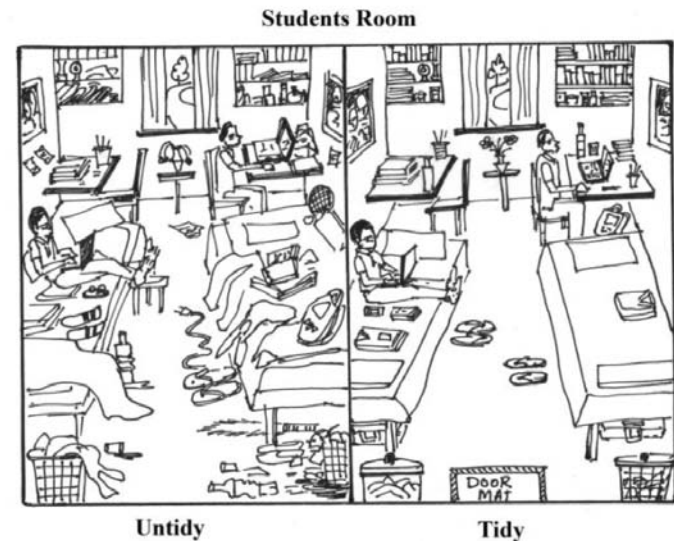


Instituting the Swachh Policy

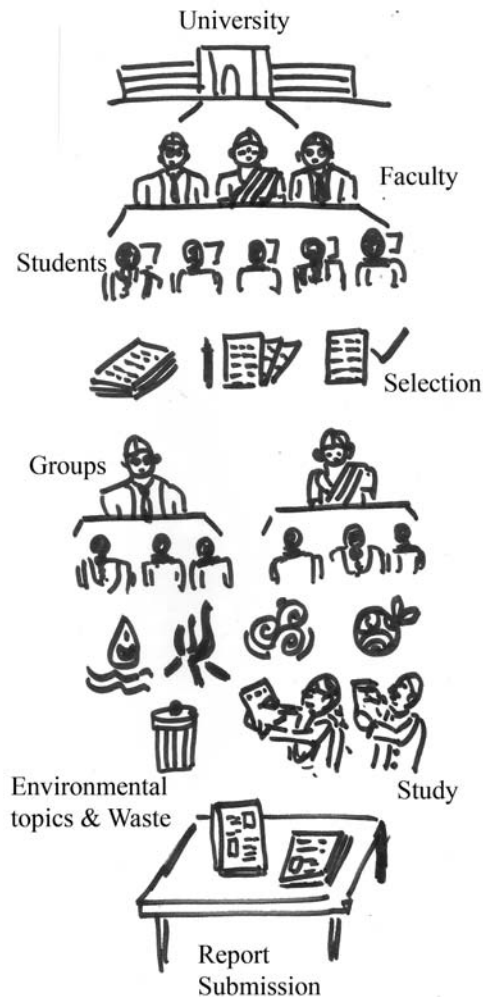
The stakeholders are to be involved in drafting a policy document covering sustainable use of resources on campus and responsible management of waste. The identified faculty can assist in this process with inputs from the identified Student Team. Once the document is finalized, all residents, staff, private businesses and students on the campus need to be continuously encouraged to adhere to each of the policy components.

The approved document must contain at least the following:

- a. **Sanitation and hygiene policy:** Maintenance of cleanliness and institutionalisation of monitoring processes.
- b. **Water conservation policy:** Optimum use of water, reuse of treated water, water saving appliances and water recycling.
- c. **Rain water harvesting policy:** Porous pavements and rainwater harvesting structures.
- d. **Waste Management Policy:** 5 R principles of reduce, reuse, recycle, refuse and regenerate as well as reducing waste sent to landfill to less than 10% of waste generated. Banning all plastic disposable items from the campus is the first step. Drawing lessons from Swachh campaign for handling computer & electronic equipment and other e-wastes.
- e. **Energy conservation policy:** Introduction of solar energy and reduction in energy consumption through technologies and management processes.
- f. **Greening Policy:** Growing endemic and endangered species of trees covering at least 33% of land area on campus.
- g. **Student Activity Policy:** Maintenance of Swachhta during students' cultural programmes and any student activities.



Action Plan



Universities and Higher Education Institutions generally have vast land area with substantial scope for harvesting rainwater, maintaining green cover and compost yards. Therefore, universities can act as lung spaces for the city. The university administration needs to identify faculty members as well as students who are actually interested in Swachhta in each building. Form teams and each team can be assigned care of one aspect of Swachhta: sanitation, waste, water, energy and greenery. Each team needs to have a faculty member and 5 to 10 students who will:

- Study, monitor and audit each area's current status on the campus
- Identify challenges problems in that particular sector and their impact on Swachhta and Community. Devise methods or alternatives to respond.
- Submit a report to the campus administration and follow them up weekly to initiate action

Step 1. Student Selection

- Basing on personal interaction identify students' aptitude covering conservation sanitation, team work, community responsibility, basic swachhta, health and hygiene, general knowledge, current affairs dealing with local news and sustainability.

Students can be given assignment on:

Working in teams, working as per predesigned targets related to:

- a) Waste Management
- b) Good sanitation and hygiene practices
- c) Water conservation practices
- d) Campus greenery
- e) Energy conservation



- The Swachh team works on a physical map of the Campus and forms it into convenient zones.
- Students may also be chosen based on their willingness and interest to be a part of the programme by assigning tasks relating to identification of aspects for Swachh Action Plan.
- After identification and orientation, encourage students into Swachh campaigning with friends and others in hostels and elsewhere who are 'willing' to participate.
- Swachh faculty would select motivated and enthusiastic students to form a strong Swachh Student Team.



Step 2. Be Active on Social Media

- Create social media platforms involving members of Swachh Teams from different departments across the campus.
- This will enhance participation and aid in the proper conduct of the programme. Only relevant issues need to be discussed by this group.

Step 3. Orientation of Swachh Student Group

- The Swachh Faculty needs to conduct orientation on practical ways of cleanliness, sustainability, expectations from students and steps in Swachh Campus Initiative.
- Guest lectures by experts, NGOs and think-tanks with interactive group discussions.
- Case studies and short documentaries on successful Swachh campaigns in other institutions
- Expectations from Swachh teams
- Monthly discussions for mid-course corrections and sharing practices.
- Conduct training programmes and workshops.

Step 6. Planning Interventions

- Based on Step 5, identify interventions to be planned for solid waste, water, sanitation, energy and greenery on the campus.
- Incorporate them on the campus with a map for easy reference and action.
- Wherever reduction or replacement is possible, it must be clearly stated.
- A comprehensive report of the findings of survey, planned interventions and assistance needed from the designated authority needs to be submitted by the Swachh Faculty at a face-to-face meeting.
- Based on the report and discussions, the designated authority deliberates on funding needs, logistic requirement (including hiring of extra staff, changing certain fixtures like taps and flushes) and external support that can be garnered for this campaign.
- This discussion will give the campus officials an opportunity to prepare strategies for Swachh Campus and in instructing staff to make internal changes in day-to-day activities, (e.g. paper use policy, switching from disposables to reusables).
- After checking feasibility of every recommendation, the designated authority considers approving appropriate interventions to be made on campus.

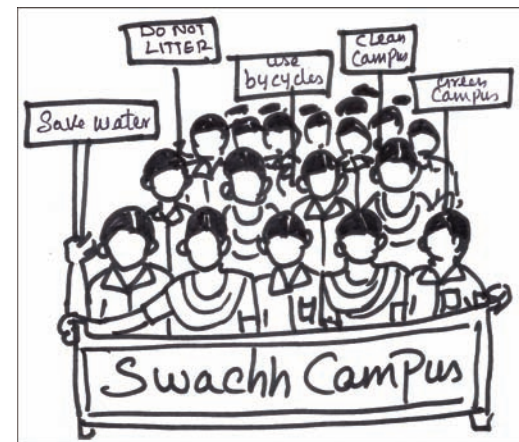
Step 7. Education and Awareness

- While logistics are being arranged by the campus officials, the Swachh Team can initiate an awareness campaign, based on the campus officials' approved interventions list.
- Swachh Student Team can prepare appropriate signage.
- Swachh Team can conduct awareness campaigns across the campus. If needed, alliances with government bodies and NGO groups could be brought in to bolster the campaign.
- Innovative ideas from students and staff, certain rewards, rallies and clean-up drives can be announced (after approval from the campus officials).

Step 8. Implementation of Swachh Campus

After the foundation for Swachh Campus campaign is laid, the logistics (equipment and staff) is to be put in place. Campus leaders need to bring certain visible changes on the campus. Start work on:

1. Sanitation
2. Waste Management
3. Water Management
4. Energy Conservation
5. Greenery





Step 9. Record-keeping and Supervision

Form a committee each to audit sanitation, waste management, water management, energy management and greenery management. This committee includes staff, faculty and student teams.

University / Higher Educational Institution:
Swachh External Member:
Swachh Team Leader:

Swachh Core Team:
1.
2.
3.
4.
5.
6.

Swachh Faculty:
1.
2.
3.
4.
5.
6.



Swachh Administrative Staff:
1.
2.
3.
4.
5.
6.

Swachh Students Team:
1.
2.
3.
4.
5.
6.

Step 10. Analysis and Action Plan

The audit documents, action plan and evaluation documents, feedback and review documents help the Swachh Team to focus on the priority areas for implementation. They also fix responsibility on the team that is working on the problem areas to complete the action within a given timeframe. These may be in hard copies, electronic format, or both as per the convenience of the institution. It is important to maintain standard formats for the ease of follow-up action.

The Swachh Team plays a vital role in supervision, reporting, quantifying, observing compliance as well as non-compliance of the new rules. The team's findings will be shared within the department and during inter-departmental meets and incorporated in the analysis.

Prepare an action plan for each challenge area and evaluate its implementation									
S No	Challenge Area	Key Challenges / Findings to be addressed on priority basis from Audit	Action to be Taken	Action Start Date	Action End Date	Responsibility	Status on End-date (Completed/ Not Completed)	Reasons for Deviation from Plan (if any) and Next Actions	Assessed by
1.	Sanitation Management								
2.	Waste Management								
3.	Water Management								
4.	Greenary on Campus								
5.	Energy Management								

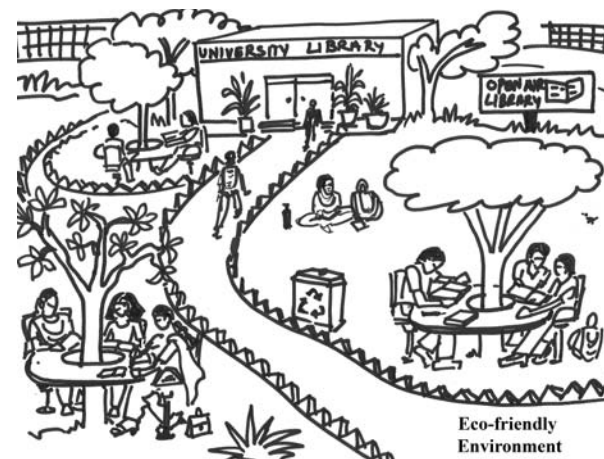
Students' Participation

It is but natural that the students participating in the Swachh Campus Initiative will be working on this project while on their regular studies. Swachh Team members will be there in the team by turn. To recognise the time and effort they spend on the Initiative, it is suggested that Swachhta could be treated as an elective subject. Campus Heads can decide on the credit system for this course.

Students should attend all the meetings of the Swachh Team and maintain a separate record book in which they will note all the happenings, such as survey details, findings, plans, actions and observations. This record book needs to be submitted to the respective Swachh Faculty for scrutiny every week. Attendance will be marked at each meeting (within the department and also inter-departmental). There can be seminar presentation with progress report, and a continual assessment based on the Swachh Faculty's observations.

Step 11. Student Swachh Kendra

1. The university may assign space in one of the buildings which can be used by the Swachh Team to hold monthly meetings and training programmes.
2. Student Committee and NSS support may be enlisted for Swachh Kendra.
3. In time, the campus can expand this space into a full-fledged Student Environment Centre or Swachh Kendra built on green building guidelines and taking into cognizance Swachh requirements and aspirations.
4. University may assign full-time staff to manage the Swachh Kendra or allow senior students to be interns there. It could be rolling internship for 3-6 months.
5. Swachh Kendra could be the hub for waste-to-wealth, Do-It-Yourself projects, weekly or monthly meetings, flea markets to swap goods and preparing for and observing the national and international days relevant to Swachhta.



Step 12. Reporting

The results of analysis will reveal several important aspects of information worth reporting. Reporting needs to be done by incorporating only factual and objective information. Some photos may also be attached.

Both internal and external reports are necessary. Internal reporting encourages accountability and ownership. It provides aggregate information on the performance summarizing its findings and providing conclusions of the assessment against pre-determined criteria. Internal reports on Swachh Campus Initiative must be circulated within the campus through intranet and in-house papers & magazines. Small parts of the report should also be displayed on notice boards, updating them every week. Mention the web link to read the full report online and encourage the students to read the full report.

External Reporting targets stakeholders outside the campus. External reports must be accurate, timely and of high quality which will help in reviewing the effectiveness of the Swachh Campus Initiative with absolute transparency. They should be made available on the official website of the institution. The availability of the report should be widely publicised.

Step 13. Feedback & Review

Once the reports are published, they will be reviewed by people on- and off-campus. This should result in feedback from the readers. Feedback could be positive, e.g. appreciation, fresh ideas to improve the implementation of the Swachh Campus Initiative. Feedback could also be criticizing some of the policies and practices. SST must look at the criticism as a reality check to identify loopholes and find alternative responses to overcome these issues. Feedback is also a tool to evaluate student, staff and team performances.

Feedback can guide the future course of action for the university. It is important that the feedback is received in a proper format. So, create a well-drafted feedback form on the website and at the end of the physical reports. The feedback forms should have plenty of white space to write. The questions should be crisp, with clear goals.

Step 14. Improving the Programme

Feedback helps the organization to adopt recommendations, improve knowledge in planning and implementation. Wherever a need arises to make modifications, the Swachh Team can suggest them to designated authorities on the campus. The final output of the findings and the suggestions will be implemented after approval by the competent authority.

Step 15. Modifying the Swachh Policy

Based on the first year's learning from Swachh Campus Initiative, a policy document can be drafted covering sustainable use of resources on campus and responsible management of sanitation, water, energy, greenery and wastes. The Swachh Faculty can assist in this process with inputs from Swachh Student Team.

Step 16. Presentation/Celebration of Achievements

Performance analysis and ranking:

S No	Criteria	Maximum points	Scored
1.	Sanitation & Hygiene	200	
2.	Waste Management	100	
3.	Water Management	100	
4.	Greenery on Campus	50	
5.	Energy Conservation	100	
	Total	550	

Step 17.

Identify Best Performers and Reward them

It takes a while for visible, identity tangible change to appear on the campus following introduction of any system. Finally it results in stability and satisfaction. Once the Swachh Campus Programme has been run successfully on campus for one year, starting from Step-8, names can be suggested for rewarding good work. The people so recognized should be from among cleaning staff, maintenance staff, Swachh Department, most dedicated Swachh Faculty and deeply involved student members or Swachh Students Team and most innovative idea providers.

A formal function could be organized to felicitate these efforts. Media and alliance partners from different fields need to be invited and thanked for their support. Following this, the Swachh Faculty and designated authority need to find avenues to portray their success story through various media like short films and documentaries on local TV channels and campus broadcasting.

Step 18.

Review and Improve

Students enrol into the university every academic year. The process needs to begin afresh from Step 1 to involve the new entrants. Identifiable problem areas could be fewer every year with action happening at ground level. Students will still learn the course by being involved in all the practical aspects of running the Swachh Campus Initiative.



Outreach

As the Swachh Campus Initiative progresses over a period of time, it is likely that many outsiders would visit the campus. They learn more and enlist the support in replicating the same model in their areas. For this, the campus needs to have a visitor centre and support team to conduct a guided tour and give necessary information to the visitors.



1. Sanitation and Hygiene

Every campus has the right as well as duty to basic facilities such as clean and functional toilets, safe drinking water, clean surroundings and basic information on sanitation and hygiene. This creates an enabling environment which secures human dignity, safety, health and overall well-being. Increasing campus awareness about good sanitation practices supported by enabling and reinforcing factors will lead to desirable changes in campuses. This stresses the importance of combining sanitation and hygiene education and practical implementation of these aspects involving the campus communities.

Wastes left unattended and untreated lead to unhygienic surroundings which lead to infections and chronic diseases. How can campuses contribute to safe and clean surroundings?

The basic principles of sanitation and hygiene include accessible infrastructures to suit different types of needs. Specific approaches and sanitation management practices need to be adhered to. There is a need for equal participation and collaboration among all campus groups. The methodologies adopted need to be for long term benefits.

- Campuses need to promote technical options (EcoSan, pit toilets, toilets with bathing spaces)
- Leadership development to steer the movement from within
- In-campus activities need to influence and develop (local, rural and urban governments, water and sanitation committees, and frontline workers) to lead, own and manage the processes and change
- Campuses need to engage with communities in villages and urban neighbourhoods to empower communities while developing and implementing local level WASH micro plans
- Overall, sanitation and hygiene initiatives need to include:
 1. Physical Appearance and Overall Ambience
 2. Adequacy of Toilets (Student/Toilet Ratio)
 3. Gender Balance of Toilets (Male: Women) self certifiable
 4. Disabled-Friendly Toilets
 5. Water Taps and Sanitation Plumbing, Adequacy and Efficiency

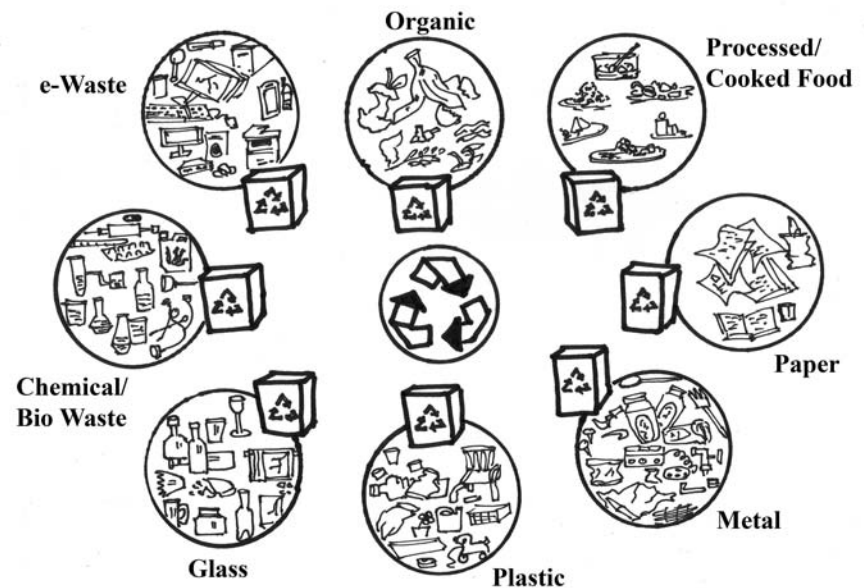
6. Water Efficient Toilets
7. Dedicated Staff for Hygiene Maintenance
8. Dedicated Staff for Hygiene Inspection
9. Kitchen Staff Apparel and Hygiene
10. Canteen Hygiene
11. Kitchen Hygiene
12. Cutlery, Crockery and Utensils Hygiene
13. Dining Hall Hygiene
14. Cleaning Equipment and Consumables

2. Waste Management

After conducting a detailed study on the segregation of the campus waste, the Swachh Student Team can discuss with stakeholders how best to categorize waste in their campus. They can keep aside old newspapers, batteries and bottles at source, until it is a substantial volume. Later give these items to waste collection team at intervals (e.g. once in 3 months), to reduce the burden on the waste collectors and segregators during secondary and tertiary segregation.

Plan for waste handling

1. Compost structure
2. Biomedical wastes, if any, must be securely and properly sent to biomedical waste treatment and disposal facilities as per the procedures laid out by the Pollution Control Board.
3. Bio-methane plant for wet waste.
4. Set up an incinerator for hazardous dry / waste.



5. Strict rules need to be implemented to prevent littering on the campus.
6. Declare the entire campus as 'No Plastic Zone'.
7. Water dispensers need to be set in several locations on campus with durable and reusable cups (bottled water as well as sale point of soft drinks and water in pet bottles on campus need to be banned).
8. Reusable tableware and eco-friendly parcelling need to be enforced in all food joints on campus.
9. A small part of the land on campus needs to be earmarked to set up four separate waste processing units: one for organic waste (biogas plant/ compost), one for secondary and tertiary segregation of dry wastes, yet another for shredding and incinerating, and a fourth one to store recyclable wastes, construction rubble and waste residue intended for municipal landfill and e-waste that need to leave the campus in a designated way.
10. E-waste is to be deposited with designated contractor duly authorised by the Pollution Control Board. Refurbished computers, monitors, scanner and printers may be donated.
11. Avoid paper pamphlets and flex banners. Instead, use reusable cloth banners and notice boards.
12. Wet waste can be treated at source itself for the benefit of other organisms. The wet waste from the kitchen and the canteen is to be collected at a place so that birds, cows, dogs, goats and small animals can feed on it. If unused food is in large quantity and not spoiled, it can be channeled to the needy through 'Food Bank' system on the campus.
13. When institutes and offices become paperless, a lot of trash can be reduced. Hence use emails, SMS, WhatsApp and Facebook and other social media platforms and online resources to a certain extent.

Waste handling	Quantity in kg							Total/ week
	Day1	Day2	Day3	Day4	Day5	Day6	Day7	
Total amount								
Waste is segregated at source or after collection								
Sorting/segregation of the wastes								
Composting								
Reusing								
Recycling								
Incineration								
Scientific land filling								



Why to create, promote, use and then worry about how to handle waste generated ? Is this an intelligent way ?

Waste recycled/reused annually in quintals	E-waste	Paper	Plastic	Metals	Glass	Others
Year 1 (prior to implementation)						
Year 2						
Year 3						
Year 4....						

Reduce, Reuse, Recycle and Compost Plan

Increase the percentage of waste reduced, reused, recycled, and composted annually. Expand the scope of waste reduction programmes to include the following: glass, steel/aluminum cans, plastic, food waste, cardboard, bond and computer paper, mixed paper, magazines, newspapers, construction, oil, leaves, tyres, scrap metal, hazardous chemicals, telephone books, contaminated soil, and mattresses at all areas and facilities of the campus.

Campus Projects on Solid Waste Management

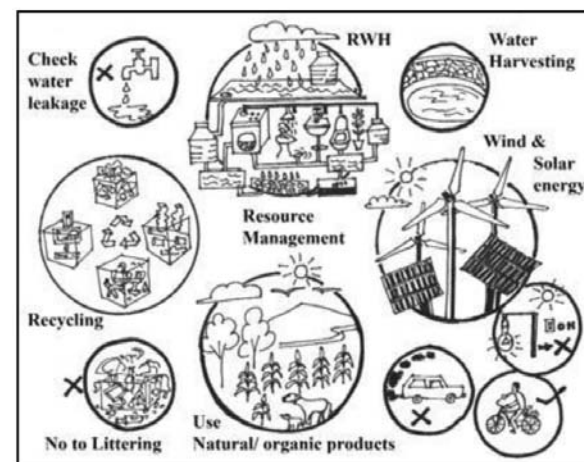
Campuses can successfully identify solid, hazardous, and radioactive waste problems and find eco-friendly solutions that save money. Solid waste on campus includes food, non-reusable cups, plates, paper, throwaway convenience items, and more. Adopt waste reduction as a goal in the university mission statement. Plan for annual improvement in the percentage of the campus waste streams that are reduced, reused, recycled or composted beyond what is mandated by law.

Publicise Methods

Prepare easy-to-understand educational materials describing the campus waste management system for sharing with all campus community members. Collect data on current and future waste costs for both the campus and community to demonstrate that waste reduction can save money. Incorporate waste storage and disposal costs into department and research budgets.

Solid Waste

Provide labeled disposal cans/boxes for each category of recyclables in convenient locations. Explore the feasibility of co-mingling materials in the campus recycling program. Establish food recovery program, where food that is not used is given to the needy. Compost garden waste leaf litter and dining hall food waste. Work with students to minimize waste when students move in, and when they move out of the campus.



Hazardous Chemical Waste

Educate the campus community to minimize the drain disposal of chemicals and the use of toxic substances in work shops, research labs and the classrooms. Reduce hazardous wastes and properly dispose materials for recycling waste oil, used batteries and solvents. Convert chemistry labs to microscale.

Waste Reduction

Raise campus awareness about the need for waste reduction: 1) organise a “Carry-Your-Own-Garbage” week, in which students (and, if possible, faculty and staff too) agree to carry their accumulated garbage all week to see how much is produced; 2) educate first-year students about the campus recycling programs as soon as they arrive; 3) prepare and distribute a short manual on what individuals can do in their daily lives; and 4) conduct a public “waste sort” at a central campus location to demonstrate how much and what type of waste is normally produced.

Reuse Strategies

Promote the use of reusables by giving away or selling them to members of the campus community and organizing discounts at local and campus stores. Work with the university stores to reduce waste: 1) establish a bag/carton return program (in which there is a small refund for returning them), 2) Promote the use of cloth bags instead of disposable bags, 3) encourage the sale of goods with less packaging; and 4) create a market for used books and other items.

Mainstream Pilot Projects

Successful, student-initiated pilot recycling projects can be assumed by the campus as a permanent program. Create waste reduction competitions, such as between hostels, clubs and departments. Organize an adopt-an-area or building program, in which campus groups or departments adopt a section of the campus and make sure waste is being reduced, reused, or recycled there. Organize a “goodwill day” at the end of each semester to collect discarded goods and give to those in need of them. Discourage excessive postering.



Possible Actions

- Student teams shall enumerate all items (stationery and non-stationery) purchased by each department, especially consumables. Assess their damaging effects on the environment, if any. Find suitable alternatives.
- Look at the possibility of reducing volume of any material use and any changes in processes which could eliminate that particular item could be brought in (eg. Plastic files can be replaced with handmade paper files, string tags instead of plastic). Also enumerate old items in stock and not used ones.
- Check the use of chemicals and consumables in laboratories. Find simple solutions to reduce their use. Conduct mini-experiments to save on chemicals. Cutting blotting paper in smaller sizes and using smaller test tubes, can improve use.
- Wherever disposable items are being used, find ways to switch to durables. Is the disposable item really required, or is it just a convenience? (e.g. disposable latex gloves are essential at many places, but avoidable at other places. Washable gloves could be better)
- Even if disposable items are to be used, buy repeat use products rather than single-use ones. Buy long-lasting fluid consumables in bulk to reduce packaging waste.

3. Water Conservation

The basic rule of water conservation is that running rain water should be made to 'walk', walking water to 'stand' and standing water to 'seep' into the ground. Choice of vegetation on campus can go a long way in maintaining quality of ground water and surface water. For example, Palmyra palm (*Borassus* spp.) plays a major role in maintaining water table, while Eucalyptus sucks away groundwater reserves.

First find out quantity of water used on the campus every day.

Water Quantity and Quality

Most of our campuses are lucky to have continuous supply of water. Many times our neighbourhood communities do not have the quantity and quality of water that our campuses have. India is using only 35 per cent of the rainwater it receives. If rainwater harvesting projects are effectively implemented, 65 per cent of the rainwater which is wasted can be used.

We degrade the water quality

We take water from wherever we can. In return, we give back waste water. So we produce waste water out of every drop of water used. About 80-85 per cent of the water we use comes out as wastewater. Much of this wastewater reaches our water sources i.e, lakes, ponds, rivers and finally seas. Used water can even pollute land if it has contaminants. Our economic growth as well as our health depends upon the quality and quantity of water available for consumption either directly or for agriculture.

We need good quality water

The demand for good quality of water is ever increasing and supply is ever decreasing. Our water-use pattern in agriculture has led to salinisation of land in fertile areas of Punjab and elsewhere. In Telangana and Punjab, farmers are provided with free electricity to help in irrigating their fields. This electricity is often misused, leading to water mismanagement and wastage. But the key issue of water is not its scarcity. It is about its careful use and fair and equitable distribution among the users.

We use water excessively

The fact is that our campuses like our urban areas and industrial centers are now drawing and drinking more water than our legitimate share. This is overburdening the water resources. Our campuses like our cities need more water for our growing populations and more importantly, growing affluence. Sometimes we are drawing water from as far as 300 kilometers distance whether it is Delhi or Hyderabad

or Bengaluru. We are getting thirstier-and the problem is that we are encroaching upon the territories of the neighbourhood, rural and urban population also. There are also water conflicts due to competing water demands. This is also seen in some campuses.

Way out is

Regulated use of ground and surface water along with rainwater harvesting are some of the ways out. We need to use best quality of water for best use and lower quality of water for cleaning and washing as well as flushing. This lower quality and larger quantity of water is available through recycling.

Rainwater harvesting can solve the crises in campuses and cities that face acute water shortages. Ironically, Delhi is one such city. We need to learn to manage water resources locally in terms of both quality and quantity. That will make it manageable. **What is measured gets monitored. What is monitored gets managed.** Lets adopt this cardinal principle of measured consumption of water for every purpose. Hence we need to install water meters and flow meters.

Monitor overhead tanks

We need to monitor the overhead tanks noting the difference in levels of water in the overhead tank from the beginning to the end of the day. Ensure that the tanks are full when the day begins. Check the water level when the teaching / learning activity in the campus ends in the day. Note the difference in levels of water for estimating the consumption of the day..

Motor method

Per minute pump wise out flow of water is measured and the number of hours the water pump is switched on is measured and water output is calculated. Every time the motor runs, this is counted and added to understand it during withdrawal of water. The administrative staff and the plumber can help in calculating. We need to conduct the water audit followed by the preparation of water budget for the campus. This water budget can be based on the quality wise quantities required for each purpose

Know the source of the campus water

Find out the source of the campus water and the capacity of it to yield water. Find out competing demands that the source experiences from surface and subsurface. Also find out the water table of your campus and the changing dimension of it seasonally and over a period of time. This gives an understanding travails in the way water travels.

Start water conservation

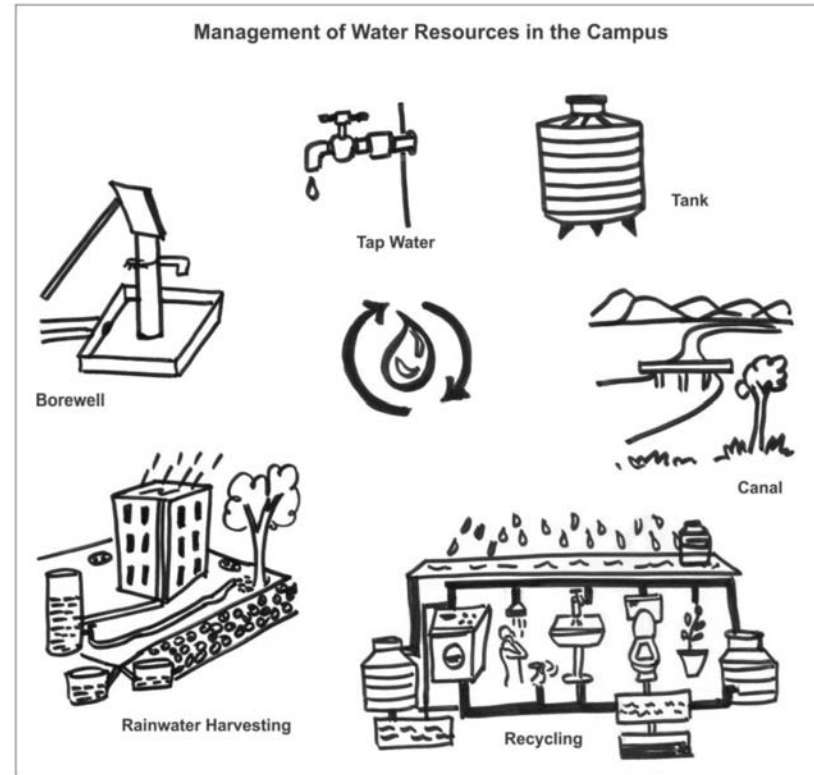
Mend the leaks in taps and pipes. Work on the toilet flushes and the optimum water use from the flush by installing two levels of flushing. An Indian household uses five litres of water per person per day for cooking and drinking but every time we flush our toilet, we use up to 9-12 liters of water. That is huge amount of water that is getting wasted.

Manage water

The campus garden also consumes water, sometimes a lot depending on the area it covers and the type of plants that are grown. Sticking to indigenous variety of plants and less water-requiring plants, not only increases the aesthetic beauty of the garden but also goes a long way in water conservation. While watering the plants, ask your gardener to water the plants either very early in the morning or very late. The best way to water plants is to focus on the root zone.

Harvesting water

India receives ample rainfall. The best way to conserve and replenish our water sources is by harvesting rainwater. Rainfall is the primary source of freshwater for us. Every campus must have its own rain gauge and its own rain recording system. This also helps in understanding the micro climate and as well as designing the recharge structures. The contour trenches, artificial ponds and roof top water harvesting structures could be designed as per the local water yield capacity, terrain, gradient of land, soil porosity and rain fall.



Recycling

Water recycling is the process of treating wastewater in order to upgrade its quality. This recycled water can be used again for other purposes as per the quality of water. Best quality of water can be put to best use. In drinking water, the first-in first-out method is adopted for retaining the quality. This also wastes lot of water. The first out of the Best Quality Water could become first use of the second best quality. This would be for bathing for instance. This understanding and water use method is to be introduced in the hostels, residences, canteens, laboratories and lavatories alike.

Plugging leakages

Water saved from leakage is water secured through pumping or rains. The leakage of water from storage points and pipelines is waste of not only water, but also the power that is used for pumping the water. Hence arresting water leakage needs to get the top most priority. Plumbers are the most important partners in the water conservation programme of the campus. Their immediate attention to leakages can arrest the water wastage. A method of geotagging the water leaking points and app-based alerts of the plumbers in the campus can arrest even water stagnation-related challenges.

Use the following table:

Water Sources Audit	Response
Number of water tanks on the campus	
What are the water sources and their number; e.g.	
<ul style="list-style-type: none"> ■ Bore-wells 	
<ul style="list-style-type: none"> ■ Municipal water taps 	
<ul style="list-style-type: none"> ■ Canals 	
Number of times the tanks are filled	
How much time does it take to fill each tank	
How many rainwater harvesting pits are there on the campus?	
Is water recycled on the campus?	
Are there any leakages of pipelines or taps?	
Do all the faucets have water efficient dispensing mechanism?	
What kind of plants are there on the campus - those that need lots of water or those that can do with little watering?	
To clean the rooms and toilets, are chemical cleaners (phenyls) used or natural products?	

Then assess: -

- What is the capacity of the campus to harvest rainwater - including rooftops, open areas, roads?
- How much of water and electricity (for pumping and cleaning) can be saved if the used water is diverted from the drinking water points, wash basins, canteen sinks to water the plants in the campus or to recharge rain water in RWH structures.
- How much is the dependence on an external source-panchayat/municipal supply/ private water tankers/ bottled mineral water suppliers?

Rainwater Catchment Areas Inverse Borewell IBW RWH method for abandoned & partially dry Bore wells

Sl. No	Name of the Block	Area(in sq. Mtrs)	Surface/ landscape and rooftop area	Taken rainwater percolation 50% for landscape & 99% for rooftop area	Volume of Rain water @ 70 cms p/a in lakhs litres
1	Dry Bore-1				
a	Admin Block Opposite area		Surface/ landscape area		
b	Pond side area from entrance left side		Surface/ landscape area		
c	Administrative Building L-shape area		Rooftop area		
	Total				
2	Dry Bore-2				
a	Left side area Opposite to CGG Building		Surface/ landscape area		
b	Right side area Opposite to CGG Building		Surface/ landscape area		
	Total				
3	Dry Bore-3				
a	Arjuna arcade		Rooftop area		
b	Between staff Quarters & Tungabhadra hostel including both Staff Quarters		Surface/ landscape area		
	Total				
4	Dry Bore-4				
a	Faculty Quarters		Rooftop area		
b	Professor Quarters		Rooftop area		
	Total				
	Grand Total				_____lakh litres per annum

Figure 3.4.1. Rainwater Harvesting Capacity/Estimation of a Campus

Possible Actions

- Swachh Student Team can participate along with the landscape maintenance staff in preparing rainwater holding and recharge structures.
- Maintaining high humus content, by not sweeping away the fallen leaves and cut grass from the grounds but collecting them, composting them and reapplying this mulch to root zones will ultimately help sink the surface precipitation quickly into the ground.
- For gently used water, with a few mild detergents and chemicals, using root zone technology is viable. Israel has made great strides in wastewater treatment using plants.

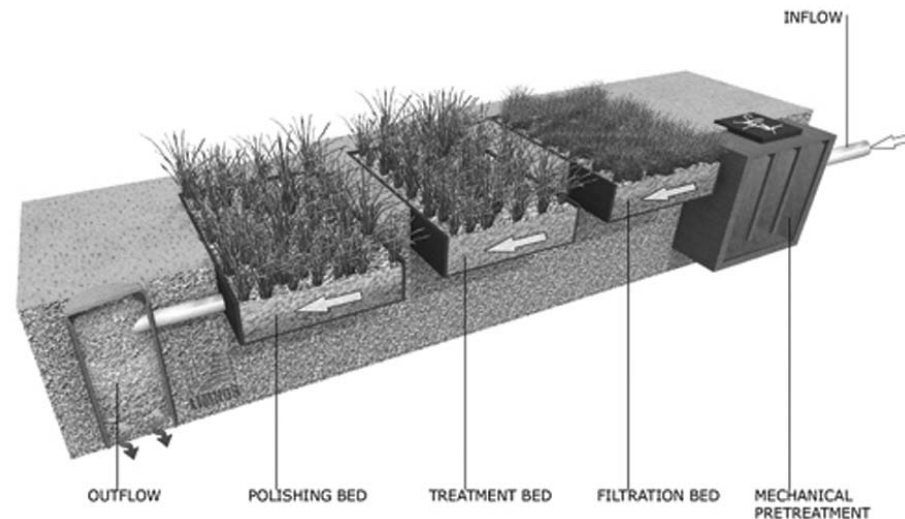


Figure 3.5.1 Water Recycling Through Root Zone Treatment

4. Greenery

With our rapid advancements, living with all kinds of innovative gadgets 24/7/365 we are forgetting that we are living beings whose survival is possible only with other living beings. Even if the oxygen, water, food and all required amenities are provided we may survive but very soon we will become mentally retarded out of loneliness. Therefore, for our sound development it is important that we learn to live happily with other beings.

Campuses have a duty towards students and society to evolve and contribute towards green present and future surroundings. Educational institutions have a vital role to play in greening practices at individual and community level, both on the campus and in the place of students residence including villages in India. The physical layout and ambience of campus encourages positive thinking. Green spaces develop surroundings which nurture connection with nature, and are often the only connection of greenery to students coming from densely populated parts.

Rain Water Harvesting Programmes extensively aid and support greening cause. Several environmental challenges are traced to air, water and soil degradation. Greenery through tree cover addresses air, water and soil degradation.

Key Points -

Green spaces in campuses attract students to the college campus.

Students need to be encouraged to recognise the importance of tree cover and increase the green hand print with planting and nurturing the trees in the campus and its neighbourhood.

Some campus sections need to be earmarked for the creation of an ecozone, which will house the following:

A nursery

A seed bank

A composting unit

Organic farming

Campuses have a duty not only towards self but also to the students and society to evolve and contribute towards increasing tree cover and reducing the effect of global warming as well as climate change.

We need to ensure that a high percentage of unpaved area is being maintained for habitat preservation. Indigenous plants and trees, fruit-bearing trees, nakshatra-vanam and campus ponds need to be encouraged.

Vanmahotsav

Ensure that Vanmahotsav programs are conducted every year in the campus. We need to plant local trees and grow local grass in the lawns. Every Vanmahotsav see if the previously planted trees are flourishing. Only compost produced from the composting unit needs to be used within the campus by strictly avoiding chemical fertilizers. We need to create pasturelands, as a soil restoration measure and to support stray herbivores.

What to plant

Planting ornamental roadside trees, monoculture and China grass lawns should be avoided. Rather, select local species that are resilient, fruit-bearing, useful as well as representative of the local natural vegetation. Plants like lantana and other exotic species must be avoided. For this, the Swachh Student Group of the Botany/Horticulture Department may work together with the landscape and garden management staff. Herbal gardens and vegetable gardens may be created and maintained by interested departments. The goal of greenery is to have 33% of the campus covered with green cover with trees having 44% canopy.

Green Buildings

- Within the set budget of construction, many changes can be made to create green structures with many eco-friendly features, with or without IGBC certification.
- Modern buildings that use glass, false ceiling and central air-conditioning are energy inefficient. They are useful in temperate climates or desert conditions where temperatures are extreme. However, in India, it is far simpler to use green walls to maintain comfortable indoor environment.
- The Swachh Team needs be involved in research and planning for the green buildings. Outside support from institutions such as Confederation of Indian Industry-Green Business Centre (CII-GBC) Hyderabad may be sought.
- Building construction and renovation plans need to include guidelines for energy-efficiency, cross-ventilation and non-toxic, environmentally-sound construction materials.
- Buildings on the campus need to be based on green building model to the extent possible. Building construction and renovation plans must include guidelines for energy-efficiency, water use efficiency, cross-ventilation, and non-toxic, environmentally-sound construction materials.

5. Energy Conservation

Campuses of Higher Education Institutions need to work on energy conservation. They consume very good quality of energy in good quantity. There is a need to utilise best quality energy for best use. Utilise solar drying and solar heating for those aspects which could be handled by direct access to sun's energy. Many campuses are working towards energy conservation these days because it makes not only environmental but also economic sense. A systematic energy audit by the Swachh Student Team and recommendations of the Swachh Team would help the campus in framing energy policy for the institution covering both consumption and production of energy. Energy Conservation requires cost centre approach, where each building will have an energy consumption sub-meter, which is read and recorded for its monthly consumption. Buildings are ranked from the highest to the lowest energy consumers. Monthly and season wise variations in the power consumption are recorded and compared. Energy consumption between the months of same year and for similar months in a span of two years is recorded building wise. Similar record of conservation needs to be developed to identify consumption and conservation patterns. Building wise strategy is developed focusing on the activities and operations which are energy guzzlers in each building. Increasing the efficiency of present and future heating and cooling systems, improving insulation, increasing efficiency of building scheduling at nights and on weekends and holidays, using alternative transportation, and planting trees to provide cooling in the summer and wind breaking in the winter, are all ways campuses can save money and be made more environmentally sound.

Every campus must have building wise and operation wise energy policy written and displayed for use by the stakeholders.

Recommendations for Designated Authorities

Engage an energy manager to initiate energy audit and coordinate efforts to promote energy-efficiency.

Allocate funds for capital expenditures to increase efficiency.

Consider several possibilities: 1) investing endowment funds; 2) taking loans for capital expenditures on efficiency whose interest is less than the annual savings from decreased energy use; and 3) allocating funds saved from efficiency investments among i) capital expense suppliers, ii) the most efficient energy users and iii) a fund for future capital expenditures for energy-efficiency that have longer payback times.

Recommendations for Staff

- Install meters to measure use of heat, electricity and water of each building or each department. Take ongoing meter measurements to set baseline data and determine progress.

Energy Efficiency

- Install efficient heating, cooling, lighting and water fixtures in all new buildings and retrofit inefficient fixtures in all existing buildings.
- Create incentives for energy-efficiency by billing individual departments for heat, electricity and water use.
- Invest in energy efficient technologies for heating, cooling, lighting and water systems in all existing and future campus buildings and earmark the savings for further improvements in environmental performance.
- Monitor the campus regularly for water and thermal leaks, lighting efficiency (new and retrofit), and equipment selection, maintenance and use. Repair or insulate as per response to findings.
- Develop coordinated heating, cooling, energy and water use practices to conserve resources. For instance, heat, cool and light buildings only when people are there. Plant native plants that require only the amount of water that falls as rain. Irrigate grounds, if necessary, when evaporation is minimal in the nights.

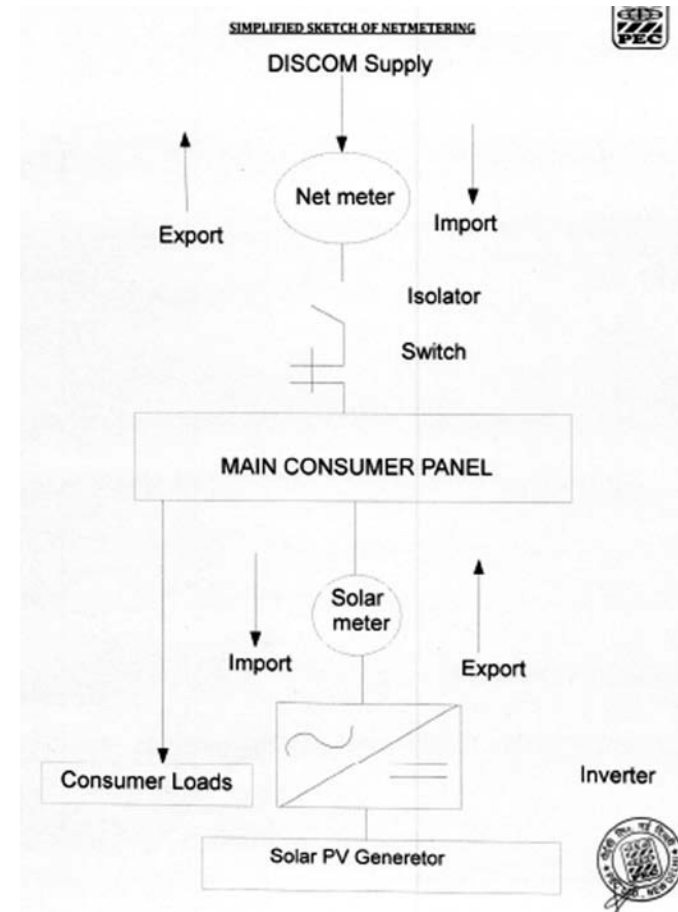
Solar Energy

- Develop a long-term plan to incorporate safe and renewable solar energy.
- Swachh Student Team needs to measure the total surface areas of various buildings where solar panels can be installed. The total solar power that can be generated by the roof tops of various buildings is calculated.
- The solar power generated from each building is linked to the grid by reverse metering technology. In this, basing on the production and consumption matching, excess power which is produced over that which is consumed is shared with the grid. The meter runs in reverse when the solar power generated by the campus is supplied to the grid. Whenever there is consumption exceeding the production, it gets metered. All buildings, quarters and independent units are metered for measurement, monitoring and management.
- Raise campus awareness about the need for energy conservation and provide incentives for action, such as by establishing campus-wide “Eco-lympics” competitions among dormitories, departments, or schools.



Energy Conservation

- Cost centre Approach with focus on high energy consuming units and blocks and consumption needs to be monitored closely.
- Inefficient sodium vapour high mast lamps on the internal roads in campus are to be replaced with low height (garden type) LED lighting.
- Conduct energy audit of the campus and its independent units for necessary inputs and recommendations.
- In the academic and administrative block, study whether a centralised AC or replacement of old ACs with energy efficient ACs would be economical and efficient.
- Provide remotes to each AC and fix it on the wall right under the AC for operational convenience.
- Install MCBs for arresting use of high power consuming appliances in all hostels.
- Install access card (key insert type) based entry to guest house and air conditioned rooms so that when out of use, power gets switched off.
- ACs temperature needs to be fixed and maintained at 24° C.
- Old high energy consuming fans need to be replaced.
- Replace CFL lamps with LED lamps in a phased manner.
- Auto door closers with no stoppers need to be installed in rooms with air conditioning.
- Air filters of all ACs need to be cleaned every 3 months.
- All hostels and kitchens are to be installed with solar water heaters.
- All street lights including common areas are to be linked to pole-top solar panels to be cost-effective.
- Instead of permanently sealed windows in air-conditioned rooms, allow for windows that can be opened, while still providing good sealing when kept shut.
- A combination of ceiling fan and AC gives a better cooling effect at warmer settings. In this way, AC can be avoided during pleasant weather.



Solar Power and Grid Connection

Table 5.1 Building Wise – Month Wise Consumption

S No	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Admin 1													
Admin 2													
Canteen													
Street lighting													
Lab 1													
Lab 2													
Hostel 1													
Hostel 2													
Sports room 1													
Auditorium													
Health Centre													
Total													

Similar data for the previous year and ensuing year, giving Building Wise – Month Wise Consumption of energy will indicate increase or decrease in energy consumption.

This item of work is given 100 points

- i. Percentage of solar energy produced as against consumed

For each percent of solar power replacing the conventional power, 2 points are allotted: Total Points-50

- ii. Total energy conserved as against last calendar year

For each percent of energy conserved as against the previous year, 5 points are allotted: Total Points- 50

Reducing our Carbon Footprint

Carbon footprint is the amount of carbon (usually in tonnes) emitted by an organization, event, product or individual directly or indirectly. Everyone's carbon footprint is dependent on location, habits and personal choice. We all contribute to greenhouse gas emissions by the way we travel, the food we eat and the amount of electricity we consume.

Our living habits make up our carbon footprint. We need to calculate our footprint and adopt a strategy to reduce it as one of the ways to being a Swachh Campus. Our food contributes to 24% of carbon, residence 6%, travel 43% while the material that we use contributes to 27% of our carbon foot print.

When we use fuel in kitchen, it generates certain amount of CO₂ in the atmosphere. When we cool our buildings, it also generates CO₂ assuming that electricity is coming from coal powered plants. Similarly when we consume food in the hostel, it also generates some quantities of CO₂ as the food gets processed. Carbon Footprint reductions require drastic changes to lifestyles and current ways of doing things.

Contributors to Carbon Footprint:

- **Our Procurement:** Purchase decisions contribute mainly to the emissions directly by way of our consumption patterns and also indirectly encouraging the production patterns.
- **Energy:** In energy, carbon footprint emissions are collective, coming from a variety of sources, namely transport, electricity and fuel emissions.
- **Waste:** Our waste comes from any process or activity and has impact on the earth's natural resources and hence it increases carbon footprint.
- **Human action (and inaction):** Our pursuit of quickness and convenience contributes to the excessive power usage and exponential increase in carbon footprints.

Swachh Procurement: Way to Reduce Your Carbon Footprint

Waste management begins with purchasing choices. The University authorities should first engage or train the Purchasing Officer to monitor carbon footprint in purchasing of all types material required (including paper, computers, furniture, etc.) in the campus. He needs to check if any items are really needed or not, or if quantity can be reduced. He needs to be effectively supported by the administration for his work. Swachh teams educate all stakeholders in the campus to decrease their materials usage.

Swachh purchasing, attempts to identify and reduce environmental impact of purchasing some items. It maximizes resource efficiency. This purchasing policy includes not only that of goods but also of services.

Some examples would be:

1. Buying from local vendors rather than importing (reduce transportation cost)
2. Choosing environment friendly products with minimal packaging wastes
3. Transport via rail or road rather than air
4. Purchasing articles with recycled content
5. Extended Produce Responsibility makes the manufacturer/ supplier responsible for establishing in situ facility for collection / recycling
6. Purchase products which are: -
 - produced in an environmentally sustainable manner
 - durable, locally made and locally mendable
 - biodegradable
 - repairable
 - energy-efficient
 - non-toxic
 - recyclable
 - provided with vendor identification for appropriate replacement of product.

Swachh Procurement Chart for Reducing Carbon Footprint

Waste reduction	Is the product durable?	Can it be easily and economically serviced and maintained?	Is the product designed to reduce consumption and minimize waste?	Is the product reusable?	Is the product technically and economically recyclable in the immediate area?	Do facilities and internal collection systems exist to recycle the product?	Can the product be returned to the supplier at the end of its useful life?	Is the product compostable and are systems in place to compost the product on or off-site?	Will the product biodegrade over time into harmless elements?
	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No
Packaging	Is the product necessary?	Can it be eliminated?	Is minimal packaging used?	Is the product packaged in bulk?	Is the packaging reusable or recyclable?	Is the packaging compostable?	At what percent post-consumer waste?	Can the packaging be returned to the supplier?	Are recycled materials used to produce the packaging?
	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No		Yes No	Yes No
Material source	Are recycled materials used in the product?	If so, what percentage?	What percentage of post-consumer materials is used?	If wood is used in the product, what is its source and how is it harvested?	Is the product manufactured from tropical rainforest wood?				
	Yes No				Yes No				
Energy efficiency	Is the product energy efficient compared to competitive products?	Can the product be recharged?	Can the product run on renewable fuels?	Does the product require less energy to manufacture than competing products?					
	Yes No	Yes No	Yes No	Yes No					
Supplier environmental record	Is the company producing the product in compliance with all environmental laws and regulations?	What is the company's record in handling environmental and safety issues?	Can the company verify all environmental claims?	Does the manufacturer/supplier have a company environmental policy statement?	What programs are in place/planned for promoting resource efficiency?	Are printed materials available documenting these programs?	Has the company conducted an environmental or waste audit?	Is the product supplier equipped to bid and bill electronically?	Has an environmental life-cycle analysis of the product (and its packaging) been conducted by a certified testing organization, such as Green Seal?
	Yes No	Good / Bad	Yes No	Yes No		Yes No	Yes No	Yes No	Yes No
Minimize Transportation:	Can the required products be obtained from local sources or can they be supplied by existing suppliers who already have delivery routes on campus.								
	Yes	No							

Convergence of Mandates with Government Programmes

Swachh Campus Initiative can be converged with certain government programmes and mandates such as Unnat Bharat Abhiyan, Rurban Mission, Smart City Mission, Swachh Bharat Abhiyan and Total Sanitation Campaign whenever possible or appropriate. If needed, Swachh Students Teams need to engage with a village to study and help the villagers in implementable solutions through participatory planning, especially in sanitation and water management.

Convergence of Mandates with Government Programmes

S.No.	Details	Response
1.	Name of Swachh Team	
2.	College/University	
3.	Department	
4.	Activity chosen	
5.	Activity start date	
6.	Activity end date	
7.	Govt programs that the activity converges into	
8.	Village chosen	
9.	List of tasks implemented	
10.	Key outcomes achieved	
11.	List of tasks pending for Implementation	
12.	Next actions	
13.	Program status assessed on	
14.	Program status assessed by	

Convergence with other Technical Courses

- Certain technical courses such as Civil Engineering, Environmental Engineering, Environmental Science, Environmental Economics, Water Management, Green Buildings, Green Electricity and Resource Management already share some aspects of the Swachh Campus Initiative.
- MGNCRE can collaborate with interested institutes or students in designing and pursuing with transaction of relevant courses. We can also help them in choosing some of these technical courses.

Observing Key Environment-related Days

- Campuses need to observe identified national and international days of importance to Swachh initiative. On those days they can focus on persisting issues and rededicate themselves to the cause.
- Swachh Teams can utilize the opportunity of these internationally and nationally observed days to initiate changes within their campus and community.
- Swachh teams can plan proactive events involving practical interventions that can be followed on by the student teams to make a tangible impact on the campus ecosystem.
- Keep these programmes open to public. If needed, move them to the nearest Sunday or holiday for greater public participation. Inform well in advance through local newspapers, radio channels and social media.
- The ideas given are guidelines. The Swachh teams need to plan activities more suited to their campus. Campus needs to grant a small fund for the proper conduct of the events.



Ways to Mark Environmentally Relevant days:

S No.	Name of Day	Date	Ideas
1.	World Wetlands Day	Feb 2	Take up cleanup drives or visits to conserve water bodies on the campus. Initiate Tank Restoration, creation of a man-made lake on campus.
2.	World Water Day	Mar 22	Revisit recycling system on campus, rainwater harvesting structures, organize a stream/ river/ well/ pond cleaning exercise, initiate drip irrigation on campus, separate storm water and drain water, survey and correct or check damaged water supply pipelines and water wastage zones.
3.	Earth Day	Apr 22	Organize a jumble sale to promote re-use.
4.	World Environment Day	June 5	Plan the programme as per the theme of the year and apply its aspects to campus or neighbourhood community
5.	No Plastic Day	July 3	Distribute cloth bags, ensure compliance with the a ban on use-and-throw items on campus; promote natural products.
6.	World Population Day	July 11	Initiate an unused medicine bank, food bank, shoe bank, book bank and cloth bank
7.	World Habitat Day	1st Monday of Oct	Visit a slum or village to study sanitation challenge and set up a small-scale Swachh Project similar to the one on the campus.
8.	World Toilet Day	Nov 19	Draw community attention to this cause through eco-friendly toilet cleaning equipment and supplies.
9.	National Pollution Control Day	Dec 2	Promote organic pesticides and fertilisers use inthe campus on this Bhopal gas tragedy day
10.	World Soil Day	Dec 5	Conduct gardening/ vermi-composting/ clay modelling to make people get in touch with with soil.

Format for Record of observing Environmental Days of importance to Swachhta

Record of Observing Key Environmental Days		
S No	Item	Details
1.	Name of Swachh Team	
2.	College/University	
3.	Department	
4.	Key Environment Day (Name & Date)	
5.	Activities Conducted	
6.	Awards Presented (if any)	
7.	Any other relevant information	
Record prepared by		
Record verified by		



Swachh Bharat - A National Aspiration

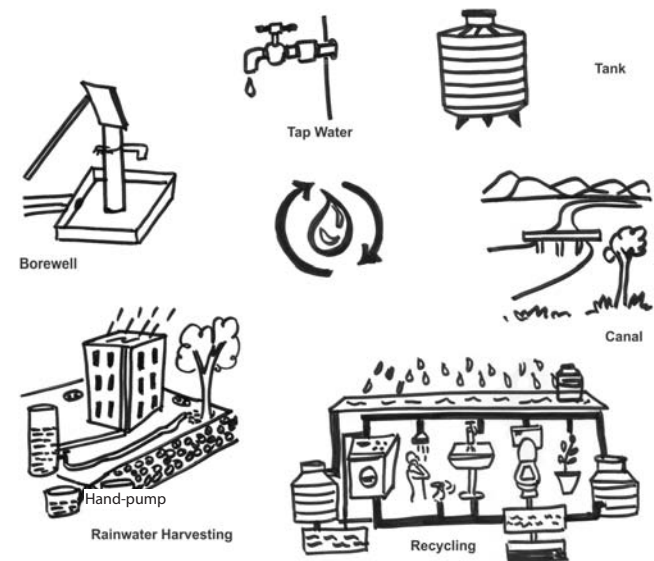
We have an aspiration of India being clean and safe. Effective waste management by adhering to proven methods of waste handling will go a long way in realizing the dream of a Swachh India. We aspire that every campus will have a Swachh policy in place and will strive to follow this plan henceforth.

Master plan for Swachh Campus Initiative has been created with the intent of spreading knowledge, skills and values pertaining to cleanliness. It envisions that the ignited minds of youth at campus will have a multiplier effect in society.

If there are any queries regarding implementation of the campaign, please write to us at swachh.mhrd@gmail.com. We would most certainly like to know your success stories, discoveries and inventions in your pursuit of a Swachh campus.

Your feedback is important to Team MHRD.

Management of Water Resources in the Campus



Swachh Campus Scorecard

Abstract of the Scorecard

S No	Criteria	Maximum points	Scored
1.	Sanitation & Hygiene	200	
2.	Waste Management	100	
3.	Water Management	100	
4.	Greenery	100	
5.	Energy Conservation	100	
	Total	600	

Sanitation and Hygiene

Every campus has the right as well as duty to basic facilities such as clean and functional toilets, safe drinking water, clean surroundings and basic information on sanitation and hygiene. This creates an enabling environment which secures human dignity, safety, health and overall well-being. Increasing campus awareness about good sanitation practices supported by enabling and reinforcing factors will lead to desirable changes in campuses. This stresses the importance of combining sanitation, hygiene education and practical implementation of these aspects involving the campus communities.

Wastes left unattended and untreated lead to unhygienic surroundings which lead to infections and chronic diseases. Campuses can contribute to safe and clean surroundings.

The basic principles of sanitation and hygiene include accessible infrastructure to suit different types of needs. Specific approaches and safe disposal of wastes need to be adhered to. There is a need for equal participation and collaboration among all campus groups. The methodologies adopted need to be for long term benefits.

- Campuses need to promote technical options (EcoSan, pit toilets and toilets with bathing spaces)
- Leadership is to be developed to steer the movement from within
- In-campus activities need to influence and develop village institutions (local government, water and sanitation committees, as well as frontline workers) to lead, own and manage the processes and change them as required
- Campuses need to engage with communities in villages and urban neighbourhoods to empower communities. This would help communities to develop and implement local level WASH micro plans

Overall, sanitation and hygiene initiatives need to include:

Table 1: Campus Score on Sanitation and Hygiene

S No	Criteria	Maximum points	Scored
1.1	Physical Appearance		
1.2	Overall Ambience of Wash Room Facilities	20	
1.3	Adequacy of Toilets (Student/Toilet Ratio)	20	
1.4	Gender Balance of Toilets (Men: Women) (self certifiable)	20	
1.5	Disabled-Friendly Toilets	10	
1.6	Water Taps and Sanitation Plumbing, Adequacy, Condition and Modernity	20	
1.7	Water Efficient Toilets	10	
1.8	Dedicated Staff for Hygiene Maintenance	10	
1.9	Dedicated Staff for Hygiene Inspection	10	
1.10	Kitchen Staff Apparel and Hygiene	10	
1.11	Canteen Hygiene	10	
1.12	Kitchen Hygiene	10	
1.13	Cutlery, Crockery and Utensils Hygiene	10	
1.14	Dining Halls Hygiene	10	
1.15	Cleaning Equipment and Consumables	10	
	Total	200	

This score card will facilitate in focusing on the important aspects of Swachh Campus. We can travel in this direction, to achieve the target of being a 100% Swachh campus.

Proper sanitation is the sine qua non of all campus facilities from the standpoint of overall health and hygiene. Being a higher educational institution, it is all the more important to have on the campus fool-proof and fail-safe systems that can serve as models for robust public health in the wider community. To check and promote benchmarks as well as systems in maintenance of sanitation, the following criteria are identified.

1.1. Physical Appearance:

For any campus, sprawling grounds, aesthetically appealing structures, soothing verdure and litter-free atmosphere are invaluable attractions that leave a lasting impact on its students, faculty and employees. This explains why it pays to make collective efforts to improve the physical appearance of buildings, canopies, lawns, pathways, roads and greenery to stand out as a Swachh Campus.

Table 1.1 Physical Appearance (20 points)

S No	Criteria	Max points	Scored
1	Visual appearance of the campus <ul style="list-style-type: none"> • Appealing facade Yes No • Full boundary wall Yes No • Security set-up to screen visitors Yes No • Visitors' lounge Yes No 	4	
2	Cleanliness of admin block <ul style="list-style-type: none"> • Is it at a reasonable/equidistance from other blocks? Yes No • Is there a dust bin attached to every table Yes No • Is there a Indexed store room for old files Yes No • Are there enough filing cabinets so that there are no piles of files on any table? Yes No 	4	

S No	Criteria	Yes	No	Max points	Scored
3	<p>Clean pathways/ roads</p> <ul style="list-style-type: none"> Are there soothing canopies and clean pathways? Yes No Are there bicycle stands for Parking cycles? Yes No Are there garden paths made with stone pavers between blocks? Yes No Are the pathways studded with dust bins at reasonable distance from each other? Yes No 			4	
4	<p>Well maintained lawns, gardens and greenery</p> <ul style="list-style-type: none"> For maintaining lawns, equipment and organic fertilizers like compost and mulch? Yes No Are there vibrant spaces in gardens earmarked for experiments on growing crops and flowers to enliven learning and teaching of natural history? Are there outdoor, living classrooms where students can experiment with techniques for growing food? Yes No Is there scope for students to compost canteen food waste and apply the compost to garden nearby? Yes No Are the areas near canteen and library canopied? Yes No 			4	

5	<p>Visibility of cleaning staff</p> <ul style="list-style-type: none"> Do members of support staff engaged in cleaning wear distinct uniforms with badges to indicate the areas in which they function? Yes No Is there a timetable for them to clean spaces and facilities? Yes No Are they readily available at such short distance that they can be called and engaged whenever required for unscheduled duty as well? Yes No Do members of cleaning staff operate at least periodically in large, unused open areas earmarked for expansion plans? Yes No 	5	
	Total	20	

1.2 Overall Ambience of Washrooms: As a part of measures to ensure sanitation, every campus must have adequate toilets for use by students, faculty, employees and visitors. These must be always kept clean, neat and odour-free, along with proper systems in place for carrying away/treating sewage or managing solid wastes, so that no trace of untreated sewage or unmanaged material enters land or water resources. Yes=1; No=0 Points

S No	Criteria	Max points	Scored
1.	<ul style="list-style-type: none"> Are the toilets at hostels, classrooms, admin block, labs, kitchen and elsewhere on campus fully covered with self-closing entrance door? Yes No Are the toilet seats, washbasins, buckets, mugs and towels clean and neat? Yes No Are the tiled walls, mirrors inside stain-free? Yes No 		

1.	<ul style="list-style-type: none"> Are air/room fresheners regularly replenished? 	Yes	No	5	
2.	<ul style="list-style-type: none"> Are there separate pipelines to carry away gray water and black water 	Yes	No	5	
3.	<p>Healthy environment</p> <ul style="list-style-type: none"> Have modern flush toilets been provided at hostels, classrooms, admin block, labs and kitchen? Is the flush system gravity-based or pressure-assisted Do the toilets stand at the standard height of 17 to 19 inches? Do the toilets have 'dual flush cistern' that gives the user an option to discharge full or reduced quantity of water depending on need. Does every flush toilet have flush tank of 6 liters capacity? 	Yes	No	5	
	<ul style="list-style-type: none"> Are the toilets so built that there is no leakage and no human waste enters water sources and land? Is excreta fully separated from contact with human beings as well as plant and animal life? Is the sewerage system carrying waste from toilets supplemented with ecological sanitation technologies? Is there a system for anaerobic digestion of sewage to produce biogas? Is there a plant to treat sewage water or isolate and treat human excreta? 	Yes	No		

4.	<p>Ventilation and exhaust facilities</p> <ul style="list-style-type: none"> • Do the toilets at hostels, classrooms, admin block, labs and kitchen have exhausts and vents? Yes No • Do the ventilation fans vent the air to the outside, rather than into the attic where it can cause mold and mildew to form? Yes No • Are there controls and protocol to switch off toilet fans and exhausts when the facility is not being used during afterhours? Yes No • Do the toilet fans and exhausts conform to BIS standards? Yes No • Is there a campaign to encourage users to switch off fans and exhausts when not in use? Yes No 	5	
	Total	20	

1.3 Adequacy of Toilets: Ideally toilets and urinals are to be provided in the ratio of 1:10 for students as well as staff and 1: 1 or 1:2 for faculty members. In hostels, the ideal ratio for toilets for the students is 1:8.

This is similar in administration and academic blocks. It is always by number of people who occupy the space and not by the space in the building. Administrative building normally has lesser density of staff and employees. The visitors stay for shorter periods.

In the academic block, the students are in higher density and the visitors stay for longer duration hence there is a requirement for more number of toilets as per the density of the students in the building. Thus the number of toilets needs to be in proportion to the density of people in a building and period of stay. The scores to be awarded would be maximum if the toilet seats match the ideal ratio mentioned above for students and faculty. Similarly the same pattern can be followed for toilet seats for visitors.

Table 1.3 Adequacy of Toilets (Student/Toilet/Wash Facilities Ratio) (20 points)

S No	Criteria (points)	Max points	Scored
1.	No. of functional toilet seats/wash facilities for students @1 or more Male Urinals per 10 Men students (2 pts) @1 Male Urinal per 10-15 Men students (1 Pt) @1 or more toilet seats per 10 Women students (2 pts) @1 toilet seat per 10-15 Women students (1Pt) @1 or more Wash Basins per 10 Men students (2 pts) @1 Wash Basin per 10-15 Men students (1Pt) @1 or more WC per 20 Men students (2 pts) @1 WC per 20-30 Men students (1Pt)	8	
2.	No. of functional toilet seats/wash facilities for faculty @1 Male Urinals per 5 Male faculty (2 pts) @1 Male Urinal per 10 Male faculty (1Pt) @1 toilet seat per 5 Women faculty (2 pts) @1 Wash Basin per 5 faculty (2 pts) @1 Wash Basin per more than 1 faculty (1Pt) @1 WC per 5 Male faculty (2 pts) @1 WC per 10 male faculty (1Pt)	8	
3.	No. of functional toilet seats/wash facilities for visitors @1 Male Urinals per 250 visitors (1Pt) @1 toilet seat per 100 women visitors (1Pt) @1 Wash Basin per 100 visitors (1Pt) @1 WC per 250 visitors (1Pt)	4	
	Total	20	

1.4. Gender Balance of Toilets: In mixed sex campuses, **toilet** facilities with water must be provided assuming a **ratio** of 60:40 for male: female. For all female toilets, there should be a facility to dispose-off sanitary napkins safely without flushing into the toilet. As such flushing causes blockage and overflow of septic tanks and drainage.

The **ratio** of urinals to WCs in male sanitation facilities should not exceed 2:1. If the toilet infrastructure matches the ideal ratio, maximum points can be awarded. Existence of separate entrances for men and women will get two points, absence – none. Availability of supervisory record of inspection by lady staff will get 5 points. Functional disposal facility of sanitary napkins in toilets meant for ladies will get 5 points.

For every wing in each floor, there is a requirement for one separate differently-abled toilet for both women and men. Hence each building needs to be provided with adequate toilet facilities keeping in mind the gender perspective.

S No	Criteria	Max points	Scored
1.	Required No. of toilet seats for students – boys 1 male urinal per 8 boys Yes/ No (1Pt) 1 WC for 15 boys Yes/ No (1Pt)	2	
2.	Required No. of toilet seats for students – girls 1 per 6 girls, (2Pt) @1 extra per every 10 girls later on	2	
3.	Required No. of toilet seats for faculty – male 1 per one faculty (1Pt) 1 per two faculty (2Pt)	2	
4.	Required No. of toilet seats for faculty – female 1 per one faculty (1Pt) 1 per two faculty (2Pt)	2	

5.	Separate entrances for men and women Separate entrance Separate block or separate place	Yes/No (1Pt) Yes/No (2Pt)	2	
6.	Supervision by lady staff for the toilets meant for women and girls Posted on duty for the building(1Pt) Established supervision cleaning and hygiene cycle in the building(1Pt) Ensured supervision once every day (1Pt) Ensured supervision twice every day (2Pt) Monthly awards for best supervision best sanitation of a building (1Pt)		5	
7.	Disposal facility for sanitary napkins in female toilets Disposal bin facility available in every toilet (1Pt) Disposal bin facility available in every toilet complex (2Pt) Collection and disposal facility exists (1Pt) Cycle of collection and disposal facility put in place (1Pt) Monitoring of the cycle of collection and disposal (1Pt)		5	
	Total		20	

1.5 Differently-abled Friendly Toilets: It is mandatory as well as humane to provide toilets for differently-abled. Exclusively designed toilets for them will enable getting maximum points. Availability of ramps which promote access, design which encourages usage and signage that informs of special facilities for the differently abled will get maximum points. This will indicate inclusiveness to the differently-abled community.

S No	Criteria	Max points	Scored
1.	Separate toilets for differently-abled faculty 1 per faculty attached to the room 1 toilet but not attached to the room 1	2	

2.	Separate toilets for differently abled students 1 per building with easy access 1 1 per floor with easy access 2	2	
3.	Availability of ramps 1 per building with easy access 1 1 to every floor with easy access 2	2	2
4.	Appropriate design of toilets to suit differently abled Allocated and created access 1 Designed specially and created access 2	2	
5.	Sign boards and information on the availability of such toilets Installing signage on the toilet availability in the building 1 Installing signage at the toilet locations 2	2	
	Total	10	

1.6 Water Taps, Sanitation and Plumbing There a need to check functional taps and also observe for leakages. Zero wastage of water will fetch maximum points. The overall cleanliness, though relative should be based on the feedback. The display and regular implementation (documentary evidence) of maintenance cycle is essential. Ensure that the toilets are kept unlocked during working hours, especially ones for disabled. If locked, a notice to mention where the key may be found may be displayed. . Unused toilets must be maintained once a week.

Table 1.6 Water Taps, Sanitation and Plumbing (20 points)			
S No	Criteria	Max points	Scored
1.	Functional taps without leakage in the toilets and campus Availability of functional taps (all points of use) in the campus toilets and bath areas (students, faculty, visitors) 1 Availability of functional taps excluding toilets and bath areas in the campus (students, faculty, visitors) – kitchens, gardens, public areas 1 Are leaking taps reported immediately Frequency of taps replacement 1 Investing on good quality taps (rust-proof, PVC) Tap Inspectors – frequency of visits 1	4	

2.	<p>Network of water pipelines – observe for leakages</p> <p>Weekly checking of water pipelines for leaks 1</p> <p>Hygiene maintenance in water pipeline areas 1</p>	2	
3.	<p>Leakages impacting roofs and sidewalls</p> <p>Identification of leaking points on roofs and sidewalls 1</p> <p>Experts/Engineers' Inspection and advice on impact of leaking roofs and sidewalls 2</p> <p>Weekly repairs/ maintenance of leaking roofs & sidewalls 1</p>	4	
4.	<p>Overall cleanliness of toilet areas</p> <p>Checking for slippery toilet floors in toilets 1</p> <p>Availability of toilet safety accessories (side handles, wall support, hand faucets) for differently enabled and elderly 1</p> <p>Availability of sanitizers, handwash, soaps, toilet cleaners in toilets 1</p> <p>Ventilation and exhaust fans in toilets</p> <p>Daily cleaning of WC, urinals in toilets 1</p>	4	
5.	<p>Maintenance cycle prominently displayed and implemented</p> <p>Toilet maintenance signage in understandable formats 1</p> <p>Transparency in information on repairs and maintenance of toilet and bath taps and plumbing fixtures 1</p> <p>Implementation of repair works under expert advice 2</p>	4	
6.	<p>Feedback mechanism</p> <p>Availability of feedback mechanism in all campus buildings for review 1</p> <p>Periodic review of leaking taps, and plumbing fixtures from students, faculty and campus residents 1</p> <p>Assessing and implementing the complaints/suggestions received from students, faculty and campus residents 2</p>	2	
	Total	20	

1.7. Water Efficient Toilets

The availability of dual flush system and sensor based taps along with dry as well as bio toilets indicate the water conservation ethos of the campus management. Therefore, there is a need to evaluate the presence of water efficient toilet infrastructure on any campus.

S No	Criteria	Max points	Scored
1.	Toilets equipped with dual flush system Flush tank has dual flush and efficient less than 6 ltrs(4Pt) Flush tank has dual flush but inefficient more than 6 ltrs(3Pt) Flush tank has single flush and efficient less than 6 ltrs(2Pt) Flush tank has single flush but inefficient more than 6 ltrs(1Pt)	4	
2.	Taps – sensor based or time Timed efficiently (2Pt) Timed not so efficiently (1Pt)	2	
3.	Availability of grey water(recycled water) for toilets Available and well connected network (4Pt) Available and not well connected network(2Pt)	4	
	Total	10	

1.8. Dedicated Staff for Hygiene Maintenance

Prohibition of insanitary practices: The campus should prohibit all forms of open urination and defecation in and around academic, administrative, residential and hostel areas. There should be respective sign boards on availability of sanitation facilities and prohibition of unsanitary habits in around the campus. The movement of stray animals and cattle needs to be restricted in order to maintain the quality of public hygiene as well as the quality of water in the campus water bodies.

The staff involved with hygiene maintenance should be adequately briefed about their roles and responsibilities. Security staff must also be trained to be vigilant. Security staff should also be provided with access to toilets close to their workstations.

Staff is to be effectively deployed area-wise for maintenance of the campus infrastructure including the toilet facility. The report of the sanitation in-charge can be taken into consideration to award points. However incidence of open defecation in the campus will result in zero points. Documentary evidence is needed on conducting training programmes and about ensuring regular health check-ups for the concerned staff to get maximum points.

The two point-sources of possible infections are waste streams from cookhouses and toilets. Keeping the kitchens and dining areas clean is imperative. So is maintaining proper free flowing drainage system which takes the waste water away, sends it through a wastewater treatment system before releasing into the common outlet. Clogged drains and exposed degradable waste will fetch zero points. Staff need to be assigned duty to maintain cleanliness of drains, to prevent blockage, water-logging, seepage, breeding of cockroaches and any possibility of contamination by drains during rainy season. For this drains must be specially checked every week.

S No	Criteria	Max points	Scored
1.	Availability of adequate staff - men and women for maintenance ✓ Is sufficient number of cleaning staff available? Yes/No (If required enquire about working conditions from a few staff members to ascertain workload and training) ✓ Is there job rotation for maintenance staff? Yes/No ✓ Is the staff motivated to maintaining a clean campus? Yes/No	2	
2.	Dedicated staff for drainage maintenance ✓ Is there staff trained for drainage maintenance? Yes/No	2	
3.	Training provided ✓ Is staff provided with sufficient training and equipment to conduct their duties satisfactorily? Yes/No ✓ Is the training holistic, covering all the tasks on campus (as mentioned in 1.8.5)? Yes/No	2	

	<ul style="list-style-type: none"> ✓ Does the maintenance staff understand his/her role in campus maintenance, and understand the entire system of on-campus cleanliness? Yes/No ✓ Was the training sufficient (ask a few cleaning staff at random)? Yes/No ✓ Is there refresher training provided periodically to improve the maintenance cycles? ✓ Is the maintenance staff literate in English/ regional language? Yes/No 		
4.	<p>Regular health check ups</p> <ul style="list-style-type: none"> ✓ Is an annual health checkup conducted for all maintenance staff? Yes/No ✓ Is special attention paid to the condition of skin, hands, feet, eyes, ears and chest during checkup? Yes/No ✓ Is the staff allowed sick leave with pay in case of poor health, especially contagious diseases? Yes/No ✓ Is there a record being maintained on illnesses among staff? Yes/No ✓ Is the maintenance staff insured for health? Yes/No 	2	
5.	<p>Roles and responsibilities of hygiene maintenance staff</p> <ul style="list-style-type: none"> ✓ General area cleaning- outdoors, roads, parking Yes/No ✓ Common areas cleaning- halls and corridors. Yes/No ✓ Special area cleaning- toilets Yes/No ✓ Garbage collection, with segregation and disposal Yes/No ✓ Special areas cleaning- dining areas, canteen, kitchens Yes/No ✓ Maintenance and basic repair of closed drainage system with periodic cleaning. Yes/No ✓ Maintenance of sewage treatment facility on campus Yes/No ✓ Special areas cleaning- laboratories and other hazardous waste generating areas. Yes/No 	2	
	Total	10	

1.9. Dedicated Staff for Hygiene Inspection

While it is necessary to have a maintenance cycles it is also imperative to have a well scheduled inspection mechanism. Documentary evidence of reporting formats as well as verification of the reported aspects along with corrective action will ensure maximum points.

Table 1.9 Dedicated Staff for Hygiene Inspection (10 points)

S No	Criteria	Max points	Scored
1.	Trained and adequate supervisory staff for inspection ✓ Is supervisor ratio maintained at 10:1/ Yes/No ✓ Does the supervisor visit twice daily and record cleaning of his/her areas? Yes/No ✓ Is the supervisory staff regularly consolidating daily reports to prepare weekly and monthly reports? Yes/No	4	
2.	Formats for daily/weekly/ monthly inspections and reports ✓ Are inspection records maintained diligently? Yes/No ✓ Are the formats easy to fill, and comprehensive? Yes/No ✓ Is there a scope for adding notes in the report? Yes/No ✓ Do reports include suggestions and complaints received by users? Yes/No	2	
3.	Random verification of reports by senior staff ✓ Does the senior staff conduct random checks to ensure smooth running of maintenance operations? Yes/No	2	
4.	Reporting of inadequate facilities and mechanism for repairs ✓ Is there a suggestion mechanism in place: eg suggestion box/ complaint register/ intranet group? Yes/No ✓ Is this checked daily/weekly? Yes/No ✓ Are complaints included in the monthly inspection reports? Yes/No ✓ Is there a complaint redressal team for Hygiene maintenance issues? Yes/No ✓ Are staff's complaints also redressed through the same mechanism? Yes/No ✓ Are suggestions given by maintenance staff considered for improvement of Maintenance Cycle? Yes/No	2	
	Total	10	

1.10. Kitchen staff: The personal hygiene of chefs, cooks, cook helpers, servers and washing staff is to be checked every day by the mess supervisors in the roll call mode. This has to be documented. Providing the staff with the required personal gear will secure maximum points. For the other parameters, availability will ensure maximum points.

The uniform for staff needs to include a cooking and serving apron as per the place of duty which has to invariably be washed and worn afresh every day. Sterilized gloves for all those who handle the food are essential. The mess contractor must inspect and certify this in every shift.

After cooking every meal, dirty utensils, leftover food and kitchen waste must be cleared immediately and workstations should be cleaned. This will prevent colonization of pests, occurrence of fungus, or accumulation of bacteria.

S No	Criteria	Max points	Scored
1.	Staff equipped with required apparel – apron, gloves, head gear and tools – cleaned and washed everyday ✓ Is the staff provided with 2 pairs of uniform? Yes/No ✓ Is there a facility for laundry provided to kitchen staff? Yes/No ✓ If not, is kitchen staff provided with the use of a washing machine, clothes drying area? Yes/No ✓ Is the staff allowed time off duty to maintain uniform hygiene? Yes/No ✓ Is there a designated place to change clothes? Yes/No	2	
2.	Chart on Dos and Don'ts ✓ Is there a prominently displayed chart regarding dos and don'ts to maintain hygiene in kitchen? Yes/No ✓ Is the chart being diligently followed? Yes/No	1	
3.	Regular health check-up for staff ✓ Is an annual health check-up provided to all kitchen staff- temporary and permanent? Yes/No ✓ Is the staff allowed sick leave with pay in case of poor health, especially contagious diseases? Yes/No ✓ Is there a record being maintained on illnesses among staff? Yes/No	2	

4.	Provision for bathrooms and toilets for kitchen staff ✓ Does kitchen staff have access to exclusive toilet and washrooms? ✓ Is a separate toilet cum wash room provided for women staff? Yes/No ✓ Is soap provided for washing of hands? Yes/No ✓ Is cleanliness and lighting, maintained at par with other bathrooms on campus? Yes/No	2	
5.	Availability of kitchen cleaning equipment. ✓ Is kitchen staff provided with cleaning equipment of keep their workstations clean? Yes/No ✓ Does the staff tidy up the entire kitchen after completing of cooking every meal? Yes/No	2	
6.	Availability of suggestions box/ complaint register? ✓ Is kitchen staff participating in the decision-making regarding cleanliness and hygiene? Yes/No ✓ Are suggestions from kitchen staff welcomed for improving the hygiene set-up of the kitchens? Yes/No ✓ Is the suggestions/complaints register checked by supervisor and health inspector on every visit? Yes/No	1	
	Total	10	

1.11. Hygiene in kitchens and canteens: Sanitation in the canteens, kitchen and all food dispensation points in the campus is very important. There is a need for inspection of the facilities for cooking, storage of raw food material, cooked food, store rooms and cold storage. Sanitation near the stoves, wash areas and the cutting areas is to be checked daily in shifts.

The overall ambience and maintenance standards of kitchens and canteens will be evaluated for maximum points depending on the visual observation.

A designated internal food inspector along with statutory inspection by the state official food inspector shall make periodic visit to the cooking places in the campus in hostel mess and canteens. He shall be asked to study and certify the cooking facilities in each every location in the campus. Certification by the statutory authority will get maximum of points.

Table 1.11 Kitchen & Canteen Hygiene (10 points)

S No	Criteria	Max points	Scored
1.	Cleanliness of the canteen ✓ Are foot mats provided at the entrance? Yes/No ✓ Are feet getting dirty on walking barefoot? Yes/No ✓ Is the floor in visitors reception area being swept and swapped twice a day? Yes/No ✓ Is the kitchen floor being swept and swapped twice a day? Yes/No	2	
2.	Maintenance cycle prominently displayed ✓ Is maintenance cycle details provided at the workstation in the cookhouse? ✓ Does staff understand and adhere to the cycle? Yes/No	1	
3.	Separate containers for wet and dry waste ✓ Are there covered dustbins provided? Yes/No ✓ Are proper labels and signs provided for customers? Yes/No ✓ Are the dustbins being used properly? Yes/No ✓ Are the dustbins cleared daily? Yes/No	1	
4.	Availability of first aid box ✓ Is the first aid box prominently placed? Yes/No ✓ Does it contain fresh medicines? Yes/No ✓ Are bandages, medical tape, scissors, tincture etc present? Yes/No	1	
5.	Ensuring zero waste while serving ✓ Is there an advance token system to prevent preparation of excessive food? Yes/No ✓ Is there a system of weighing and recording food waste daily? Yes/No ✓ Is the level of wastage reducing everyday? Yes/No ✓ Is the reason for anomaly (if any) mentioned in the report? Yes/No ✓ Is the food waste sent for reuse (e.g. piggery/ biogas) or composting? Yes/No	1	

6.	<p>Availability of clean drinking water (At least 6 points should be satisfied to score points) :</p> <ul style="list-style-type: none"> ✓ Is the water filter/ R.O machine in good working condition? Yes/No ✓ Is it maintained under AMC? Yes/No ✓ If water is supplied by a private agency, is it tested OK? Yes/No ✓ If water filters are absent, is drinking water boiled before serving? Yes/No ✓ Are clean water tumblers provided? Yes/No ✓ Is the filter leaking/ in rusty condition? Yes/No ✓ Is drinking water available 24/7 : Yes/No ✓ Is the area around the inlet and drinking water point clean and dry? Yes/No 	1	
7.	<p>Usage of eco-friendly packing material for takeaway food</p> <ul style="list-style-type: none"> ✓ Are own tiffin boxes encouraged? Yes/No ✓ Are paper/ aluminium foil containers used? Yes/No ✓ Are Plastic spoons and straws provided? Yes/No 	1	
8.	Certification by statutory authorities	2	
	Total	10	

1.12. Kitchen hygiene

The fuel used for cooking should be LPG or bio gas or solar, where not possible, wood as a cooking medium can be used. In such unavoidable circumstances the certified smokeless chullahs can be used.

The hostel kitchen is to be of modular type with free ventilation for the smoke and drainage facility for each cooking, cutting and washing area. Disinfection of the cooking area is required by way of fumigation on a weekly basis.

Table 1.12 Kitchen hygiene (10 points)

S No	Criteria	Max points	Scored
1.	Overall cleanliness of the kitchen, especially wash area ✓ Are the kitchen sinks clean? Yes/No ✓ Are dirty dishes and utensils being washed with standard cleaning agents and scrubbers? Yes/No ✓ Is there a presence of cockroaches, flies, ants, rodents, cats or dogs around the canteen? Yes/No ✓ Is there presence of mould, fungus, termites, etc in the kitchen area? Yes/No	2	
2.	Type of fuel used for cooking(any of the following) ✓ LPG. Yes/No ✓ At least 50% of fuel should be biogas/ solar, Yes/No ✓ 0-20% may be wood based and smokeless chullahs Yes/No	1	
3.	Separate containers for wet and dry waste(0.5.pts each) ✓ Are there covered, colour-coded dustbins provided? Yes/No ✓ Are proper labels and signs provided for customers? Yes/No ✓ Are the dustbins being used properly? Yes/No ✓ Are the dustbins cleared daily? Yes/No	2	
4.	Modular kitchen facilities ✓ Is the kitchen ergonomically designed? Yes/No ✓ Is the kitchen space and pantry well organized? Yes/No ✓ Is the food storage inspected weekly? Yes/No ✓ Is purchasing of food items done systematically to ensure minimum old stock, smooth running of kitchen, and regular purchase of fresh foods? Yes/No ✓ Are all perishables stored at proper temperatures in respective compartments of the refrigerator? Yes/No ✓ Is the refrigerator clean and free of frost? Yes/No	1	

5.	Regular fumigation ✓ Is the kitchen pest-free? Yes/No ✓ Is there a proper procedure and plan for fumigation? Yes/No ✓ Is the kitchen staff well-versed in precautions to take during fumigation? Yes/No	1	
6.	Well ventilated ✓ Does the kitchen have exhaust fans and chimneys Yes/No ✓ Are there fans, windows and ventilators provided for cross ventilation? Yes/No	1	
7.	Availability of water 24 hrs ✓ Is there safe, clean water available for cooking and cleaning? Yes/No ✓ If water supply is intermittent, is there a water storage tank provided for the kitchen? Yes/No ✓ Is the tank cleaned portnightly? Yes/No	2	
	Total	10	

1.13. Cutlery, Crockery and Utensils Hygiene: Cutlery and crockery need to be sterilized with hot water. This is required every time they are put to use. A continuous hot water/hot vapor facility for sterilizing the cutlery and crockery is to be made available and kept in continuous and regular use.

Indicators of promoting eco-friendly cutlery, as well as availability of cleaning material along with ensuring appropriate disposal of leftover food will get maximum points. Documentary evidence supporting regular supervision of cleaning activity will get points.

S No	Criteria	Max points	Scored
1.	Availability of hot water 24 hrs ✓ Is hot water provided for final rinse of serving ware? Yes/No ✓ Is this water solar-heated? Yes/No	2	
2.	Usage of eco-friendly cutlery and crockery ✓ Is the crockery made of durable material, e.g. stainless steel, or inert material like glass/ porcelain? Yes/No ✓ If not, is it of standard, food-grade plastic? Yes/No ✓ Is the crockery in good condition? Yes/No (Chipped, cracked, stained crockery can breed germs)	1	

3.	Availability of adequate cleaning material ✓ Are dirty dishes and utensils being washed with standard cleaning agents? Yes/No ✓ Is the kitchen staff provided with cleaning liquids and scouring agents pH balanced, eco-friendly and of high quality? Yes/No ✓ Are the scrubbers replaced/ disinfected regularly Yes/No ✓ Are dirty utensils stacked for cleaning for more than 1 hour? Yes/No	1	
4.	Ensuring food waste and leftover material is not dumped into the drains ✓ Is there water logging observed near drains due to left-over food waste? Yes/No ✓ Does the vicinity of drains look clean and odour free? Yes/No ✓ Is there a proper food waste management system in place. Yes/No ✓ Is waste food attracting wild/ feral animals? Yes/No ✓ Are there stringent rules/ fines for improper waste disposal? Yes/No	2	
5.	Disposal facilities for leftover food and kitchen waste ✓ Is the food waste sent for reuse (e.g. piggery/ biogas) or composting? Yes/No ✓ Is cooked, but unused food thrown away Yes/No ✓ Is there a mechanism to minimize food wastage? Yes/No	2	
6.	Supervision of cleaning activity ✓ Is there a dedicated supervisor to ensure proper cleanliness in the kitchen? Yes/No	2	
	Total	10	

1.14. Dining Halls Hygiene

There shall be social audit of the food dispensation facility by a designated committee consisting of the staff, faculty and students. Social audit needs to utilize the designated form for inspecting the facility and suggesting the improvements every fortnightly. The committee should ensure prominent display of do's and don'ts, as well as ensuring cleanliness of furniture. Suitable documentation will get maximum points.

The committee should also ensure appropriate lighting arrangement as well as ventilation to secure maximum points. Leaving of footwear outside the dining hall with suitable signage should be seen as an endorsement of our cultural heritage as well as promoting hygiene to get maximum points.

Mark the questionnaire with a circle on one of the choices Yes/No. If the first option is chosen more frequently, then marks may be granted, else not. If a certain intervention is not immediately noticeable, enquire with staff about it before making a choice.

Table 1.14 Dining Halls Hygiene (10 points)

S No	Criteria	Max points	Scored
1.	Display of do's and don'ts for dining hall usage ✓ Is there a visible signage regarding rules of the dining hall (covering food wastage, general hygiene practices, food?) Yes/No ✓ Can students and visitors be observed following these rules? Yes/No	2	
2.	Cleaning of tables and furniture ✓ Are tables and chairs neat and clean? Yes/No ✓ Are tables cleaned satisfactorily after every use? Yes/No ✓ Is the duster used for final cleaning of the table washed / replaced regularly? Yes/No	1	
3.	Lighting arrangements ✓ Is there sufficient natural light in the hall? Yes/No ✓ If not, is the hall illuminated with LED/ CFL during meal times? Yes/No ✓ Are hand wash areas, plate deposit area and water dispensing point also well-lit? Yes/No	1	
4.	Ventilation ✓ Does the dining hall air smell of cooking and smoke? Yes/No ✓ Is there plenty of fresh air? Yes/No ✓ If air conditioned, is the hall AC working at suitable temperature (around 25 degrees) Yes/No ✓ Does the air smell musty in the AC dining hall? Yes/No	2	

5.	Leaving of footwear outside the dining hall ✓ Is there a designated shoe rack for keeping footwear outside the hall? Yes/No ✓ Does the hall floor leave the soles of your feet dirty? Yes/No ✓ Is there a proper foot mat Yes/No	2	
6.	Fly-proofing ✓ Are house-flies present in the dining hall? Yes/No		
	✓ If present, is there an electric fly-trap provided? Yes/No		
	✓ Is all the food kept well covered to prevent flies from contaminating food? Yes/No	2	
	Total	10	

1.15. Cleaning Equipment and Consumables

Availability and functional efficiency of cleaning equipment will contribute a long way in maintaining cleanliness. A move towards acquiring mechanical equipment will get maximum points. Availability of consumables as well as regular replenishment is necessary and documentary support will ensure maximum points. A well defined regulatory mechanism along with regular feedback will ensure hygienic environment thereby ensuring maximum points.

Table 1.15 Cleaning Equipment and Consumables (10 points)

S No	Criteria	Max points	Scored
1.	Availability of manual cleaning equipment ✓ Are there enough brooms, mops, dusters, brushes, scoops? Yes/No ✓ Are they in good working condition? Yes/No	1	
2.	Availability of mechanical cleaning equipment ✓ Are vacuum cleaners, air pressure or water pressure based cleaning tools available? Yes/No ✓ If not, are they rented from time to time for use in the Institution? Yes/No	2	

3.	<p>Availability of cleaning consumables</p> <ul style="list-style-type: none"> ✓ Are cleaning liquids such as toilet cleaners, detergents, acid, bathroom fresheners, rubber gloves, etc purchased regularly? Yes/No ✓ Are cleaning staff trained in using these in optimal quantity? Yes/No ✓ Are the cleaning liquids eco-friendly? Yes/No ✓ Are cleaning consumables stored in a well-ventilated space? Yes/No 	2	
4.	<p>Systematic and regular replenishment of cleaning consumables</p> <ul style="list-style-type: none"> ✓ Is a protocol followed to quantify requirement for cleaning consumables? Yes/No 		2
5.	<p>Feedback from the cleaning staff</p> <ul style="list-style-type: none"> ✓ Is the demand placed by them regarding cleaning consumables fulfilled within 2 working days? Yes/No 	2	
6.	<p>Feedback from students and faculty</p> <ul style="list-style-type: none"> ✓ Does the odour and sight of toilet spaces indicate that cleaning consumables are sufficiently used? Yes/No 	1	
	Total	10	

2. Waste Management

Though visible cleanliness of any public space is an essential requirement for public hygiene, it needs to have an effective back up. This requires efficient waste management. Hence such exercise encompasses reducing, reusing, recycling waste material which will improve the economic and environmental performance of the Institutions. The simple steps along with the scoring system in this section, will help you to map out your existing waste management practices.

2. Campus Score on Solid Waste Management

S No	Criteria	Maximum points	Scored
1.	Segregation of Solid Waste	15	
2.	Collection of Solid Waste	15	
3.	Reuse and Recycling of Solid Waste	35	
4.	Disposal of Solid Waste	15	
5.	Waste Management Initiatives	15	
6.	Bio Medical Waste managed as per Rules	5	
Total		100	

Quantity of solid waste generated : For ideal quantity of solid waste generated the maximum points the campus can score is 15 points

1. Maximum permissible waste per person per day ideally for a day scholar is 150 grams
2. Maximum permissible waste per person per day ideally for a hosteller is 350 grams
3. Ideal total waste (Strength of day scholars/day visitors x 150grams x working days i.e., weekdays) + (Strength of hostels/residents x 350grams x campus stay days) =
4. Actual waste = (Capacity of vehicles x number trips per day + amount of waste composted in-situ per day + amount of waste collected for recycling per day) x 365 =
5. Actual waste – Ideal waste = A (quantity of excess solid waste produced)
6. $A/\text{Ideal quantity of solid waste} \times 100 \times 0.10 = X$
7. Points scored for quantity of solid waste produced = 15-X
8. In case the solid waste generated is lesser than the ideal quantity then give 15 points
9. Ideally the quantity of solid waste generated should not exceed 150 grams per person per day.

Fill in at relevant places

	2.1.1 Segregation done at Source (5 points)	Type										Scored
		Solid		Wet		Lab Waste		E-waste		Biomedical		
	Source	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1	Office Buildings/Blocks											
2	Library											
3	Training/ Conference Halls/ Classrooms											
4	Auditorium											
	(1 point)											
5	Hostels											
6	Staff Quarters											
7	Guest Rooms											
	(1 point)											
8	Canteens											
9	Dining Halls											
10	Kitchens											
	(1 point)											
11	Grocery Store Rooms											
12	Crockery Store Rooms											
	(1 point)											
13	Health Centres											
14	Play grounds											
15	Utilities (Bank, Post office, Stores, Generator rooms, Sewage)											
	(1 point)											
	Total Points (5)											

S No	2.1.2 Dry/Wet Bins Available in Vicinity (5 points) Source	Type										Scored
		Solid		Wet		Lab Waste		E-waste		Biomedical		
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1	Office Buildings/Blocks											
2	Library											
3	Training/ Conference Halls/ Classrooms											
4	Auditorium											
	(1 point)											
5	Hostels											
6	Staff Quarters											
7	Guest Rooms											
	(1 point)											
8	Canteen											
9	Dining Halls											
10	Kitchens											
	(1 point)											
11	Grocery Store Rooms											
12	Crockery Store Rooms											
	(1 point)											
13	Health Centres											
14	Play grounds											
15	Utilities (Bank, Post office, Stores, Generator rooms, Sewage)											
	(1 point)											
	Total Points (5)											

S No	2.1.3 Methodological and Safe Segregation by Rules (5 points) Source	Type										Scored
		Solid		Wet		Lab Waste		E-waste		Biomedical		
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1	Office Buildings/Blocks											
2	Library											
3	Training/ Conference Halls/ Classrooms											
4	Auditorium											
	(1 point)											
5	Hostels											
6	Staff Quarters											
7	Guest Rooms											
	(1 point)											
8	Canteens											
9	Dining Halls											
10	Kitchens											
	(1 point)											
11	Grocery Store Rooms											
12	Crockery Store Rooms											
	(1 point)											
13	Health Centres											
14	Play grounds											
15	Utilities (Bank, Post office, Stores, Generator rooms, Sewage) (1 point)											
	Total Points (5)											

2.2 Collection of Solid Waste

Solid waste collection: Waste collection system: Ideally biodegradable, non-biodegradable waste and domestic/institutional hazardous waste should be collected separately for easy processing for reuse. This helps to keep the campus clean always. This will score 10 points:

1. Campus has 3 containers at **all** waste collection points, pts scored:
 - a) First determine the percentage of waste collection points which have three containers by applying the formula:
$$\frac{\text{Number of 3-bin waste collection points}}{\text{Total number of waste collection points}} \times 100 = a \dots (\% \text{ of waste collection points with 3 bins})$$
 - b) Pts scored by the campus are: $\frac{10 (\text{pts for waste collection}) \times a}{100}$
2. No segregation of waste at source, staff segregates biodegradable and non-biodegradable = 5 pts.
3. Campus segregates waste at source, doesn't maintain segregation after collection = 5 pts
4. Campus segregates waste at source & maintains segregation during and after collection = 15 pts
5. No segregation of solid waste at any level the score is 0.

The points scored for collection of waste are = _____.

2.2.1 Collection Points Available (5 points)		Types of waste										Scored
		Solid		Wet		Lab Waste		E-waste		Biomedical		
S No	Source	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1	Office Buildings/Blocks											
2	Library											
3	Training/ Conference Halls/ Classrooms											
4	Auditorium											
	(1 point)											
5	Hostels											
6	Staff Quarters											
7	Guest Rooms											
	(1 point)											
8	Canteens											
9	Dining Halls											
10	Kitchens											
	(1 point)											
11	Grocery Store Rooms											
12	Crockery Store Rooms (1 point)											
13	Health Centres											
14	Play grounds											
15	Utilities (Bank, Post office, Stores, Generator rooms, Sewage) (1 point)											
	Total Points (5)											

2.2.2 Collection Staff Available (5 points)		Types of waste										Scored
		Solid		Wet		Lab Waste		E-waste		Biomedical		
S No	Source	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1	Office Buildings/Blocks											
2	Library											
3	Training/ Conference Halls/ Classrooms											
4	Auditorium											
	(1 point)											
5	Hostels											
6	Staff Quarters											
7	Guest Rooms											
	(1 point)											
8	Canteens											
9	Dining Halls											
10	Kitchens											
	(1 point)											
11	Grocery Store Rooms											
12	Crockery Store Rooms											
	(1 point)											
13	Health Centres											
14	Play grounds											
15	Utilities (Bank, Post office, Stores, Generator rooms, Sewage)											
	(1 point)											
	Total Points (5)											

2.2.3 Transport and Disposal of Staff Available (5 points)		Types of waste										Scored
		Solid		Wet		Lab Waste		E-waste		Biomedical		
S No	Source	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1	Office Buildings/Blocks											
2	Library											
3	Training/ Conference Halls/ Classrooms											
4	Auditorium											
	(1 point)											
5	Hostels											
6	Staff Quarters											
7	Guest Rooms											
	(1 point)											
8	Canteen											
9	Dining Halls											
10	Kitchens											
	(1 point)											
11	Grocery Store Rooms											
12	Crockery Store Rooms											
	(1 point)											
13	Health Centres											
14	Play grounds											
15	Utilities (Bank, Post office, Stores, Generator rooms, Sewage)											
	(1 point)											
	Total Points (5)											

2.3 Reuse and Recycling

Reuse and recycling of solid waste carries 35 points.

1. Determine the points scored in this section by :
 - a) $\frac{\text{Quantity of type of solid waste reused, recycled}}{\text{Total quantity of that type of waste}} \times 100 = a \dots$ (Percentage of the type of solid waste reused, recycled)
 - b) Calculate points scored by applying the formula:
 $\frac{\text{Weightage allotted to each type of waste (refer weightage chart)} \times a}{100}$
2. Total points scored by the campus for disposal of each specific type of waste and add all in.
3. For medical waste —signing with designated facility after autoclaving and disinfecting 5 pts.

2.3 Reuse and Recycling (35 points)												Scored
S No	Initiatives	Solid		Wet		Lab Waste		E-waste		Biomedical		
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1	Pre-treatment (5 points)											
2	Sorting of the wastes (5 points)											
3	Mechanical pulverization (5 points)											
4	Incineration (5 points)											
5	Landfills (5 points)											
6	Composting (10 points)											
	Total Points (35)											

2.4 Solid Waste Disposal: *efficiency of waste disposal depends upon quantum of disposable waste*

Table 2.4.: Waste disposal record of the campus (in kgs) per day:

S NO	Location	Quantity of disposable waste generated	Quantity of waste disposed off	% of waste properly disposed off
1.	Academic Buildings			
2.	Administrative Buildings			
3.	Hostels			
4.	Common areas			
5.	Canteens			

Table 2.4.1: Total solid waste shifted to the dump yard (in tonnes)

Type of waste	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Wood, glass, metal scrap, other scrap													
Electronic and computer consumables													
Food waste													
Total Waste													

S No	Initiatives	Solid		Wet		Lab Waste		E-waste		Biomedical		Scored
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
1	Channelised and Methodical Disposal (5 points)											
2	Sanitary Landfills (5 points)											
3	Under Purview of Designated Authority (5 points)											
	Total (15 Points)											

2.5 Waste Management Initiatives: Campus Initiatives

It is important to appreciate the initiatives taken by the management on issues related to waste. For technological institutions installing and managing a waste management system would be required as part of the institution level interventions would be the expectation. For non technological institutions engagement with neighbourhood community, slum or village for ensuring that it is 100% Swachh would be the expectation (under S No 4 in Table 2.5). The approach in management of waste by the Higher Education Institutions can be assessed in the following way:

Table 2. 5 Waste Management Initiatives (15 points)		Types										Scored
		Solid		Wet		Lab Waste		E-waste		Biomedical		
S No	Initiatives	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No No	
1	Technological and sociological interventions (10 Points)											
2	Planning, Preparing and Reporting Mechanism (1 point)											
3	Appropriate display, advertising, sharing knowledge (1 point)											
4	Treating sanitation workers with respect and looking into their welfare (1 point)											
5	Adhering to Reporting Mechanisms (1 point)											
6	Designated Officer Monitoring and taking Corrective measures for Waste Management (1 point)											
Total Points (15)												

2.6 Bio-medical Waste

Table 2.6 Bio-medical Waste (5 points)

S No	Initiative	Yes	No	Scored
1	Bio Medical Waste Managed as per Rules (1point)			
2	Disposal of human anatomical waste (1point)			
3	Disposal of animal waste (1point)			
4	Disposal of waste sharps (needles, syringes....) (1point)			
5	Disposal of cytotoxic drugs and medicines (1point)			
	Total Points (5)			

3. Water Usage:

Campus Score on Water			
S No	Criteria	Maximum points	Scored
1.	Water Availability	10	
2.	Usage of Water	10	
3.	Water Quality	10	
4.	Rainwater Harvesting	30	
5.	Recycling	30	
6.	Campus Initiatives	10	
	Total	100	

3.1 Water Availability

10 Points

Effectiveness of Sanitation is dependent upon water which is universal cleansing agent and universal solvent. Continuous availability of water is an important aspect of continuous maintenance of sanitation and cleanliness. Hence maintenance of sanitation is also dependent on ensuring stable and dependable water supply for sanitation purposes. While 24 hours supply of water needs to be given 15 points on a scale of 0-15, less than 12 hours supply of water is of no consequence hence has to be given 0. Accordingly the scoring is to be given.

a. 24 hrs = 10 points, b. 20 hrs = 8 points, c. 16 hrs = 3 points and d. 12 hrs and below = 0 points

To ensure availability of water the following quantification needs to be kept in mind by the Higher Education Institutions:

- i. Maximum water per person per day ideally for day scholar/faculty/staff is 30 LPCD
- ii. Maximum water per person per day ideally for hosteller is 100 LPCD
- iii. Maximum water per other resident per day ideally 135 LPCD
- iv. Ideal total water

$(\text{Strength of day scholars/day faculty/day staff/day visitor} \times 30\text{LPCD}) + (\text{Strength of hostels} \times 100\text{LPCD}) + (\text{Strength of residents} \times 135\text{LPCD})$

Table 3.1. Use-Wise Average Consumption of water (in litres)

S.No.	Uses	Day scholar/Day Resident	Hosteller	Other full time resident
1.	Drinking	3	8	8
2.	Bathing	—	20	20
3.	Washing	6	20	40
4.	Flushing	14	30	40
5.	Other uses	7	22	27
Total		30	100	135
Cleaning: 0.5(litres/sqmts) for work area 1.5(litres/sqmts) for residential area				
Gardening: 2.5(litres/sqmt)				

3.2. Usage of water

10 Points

Usage of water depends on availability, habits and the quality of water dispensing systems like taps, storage points and pipelines

- Actual water consumption – Ideal water consumption = A (quantity of excess water consumed)
- $A \text{ (quantity of excess water consumed)} \div \text{Ideal quantity of water consumption} \times 100 \times 0.10 = X$
- Points scored for quantity of water consumed = $20 - X$

If the consumption of your institution is less than 30 LPCD (day scholar), 100 LPCD (hosteller) and 135 LPCD resident, your institution gets 10 points, a. deduct 0.9. for every litre consumed over 30LPCD(Day resident), b. deduct 0.9. for every litre consumed over 100LPCD(hosteller) and c. deduct 0.9. litre for every litre consumed over 135 LPCD(resident)

Source 1: Pipeline through municipality/corporation/ PWDs/ gram panchayats

Source 2: Well, borewell and tubewell in the campus

Source 3: Waterfall, stream and canal (independent sources)

Ask administrative staff for water bills which contain the quantity of water drawn from a particular source.

Calculate the percentage of water drawn from a particular source for a specific purpose (drinking, flushing) applying the formula given below. For other sources, find out the total receptor storage space capacities and multiply it receptor-wise by the number of times they are filled per day.

$$\frac{\text{Quantity of water drawn from a particular source}}{\text{Total quantity of water used for a specific purpose}} \times 100$$

Table 3.2. Quantity of water consumed in litres per day

Uses	Source 1	Source 2	Source 3
Drinking			
Washing			
Flushing			
Cleaning			
Gardening			
Other uses			
Total			

Table 3.2.1. Percentage of water drawn in litres per day

Uses	Source 1	Source 2	Source 3
Drinking			
Washing			
Flushing			
Cleaning			
Gardening			
Other uses			
Total			

3.3 Water Quality (10 points)

Availability of water as per BIS standards for drinking water needs to be ensured for cooking and drinking purposes. The campus has to handle aspects related to the presence of arsenic, fluoride and other salts naturally available in the ground water. It has to also ensure that the biological impurities do not join the drinking and cooking water. The overhead tanks and underground sumps which handle the drinking water need to be periodically cleaned. The periodicity of cleaning will determine the quality of stored water. When water from public source is taken, it is essential to check the quality of water for nitrates and phosphates apart from biological impurities.

Hence periodic chlorination of drinking water in the storage points viz., sumps and overhead tanks is essential. One way of retaining the quality of water is adding chlorine and ensuring the residual chlorine at 4 ppm. There should be a protocol of checking residual chlorine for every source of drinking water every day by using the chloroscope. Monthly testing of water quality as per BIS standards is to be ensured drinking water storage tank wise.

Table 3.3 Drinking water quality (10 points)

S No	Criteria	Max points	Scored
1.	Availability of clean source of water ✓ Is the clean drinking water supplied periodically? Y/N ✓ Are the sumps filled everyday? Y/N	2	
2.	Maintenance of clean sources of water ✓ Are the sumps cleaned every month? Y/N ✓ Are the sumps chlorinated every day? Y/N	2	
3.	Availability of testing equipment ✓ Are chloroscopes available for testing water quality in every building ? Y/N ✓ Are the chloroscopes maintained with required calibration? Y/N	2	
4.	Usage of chloroscope for testing of water quality or is the water tested periodically ✓ Are chloroscopes utilized for testing water quality in every building? Y/N ✓ Are the chloroscopes maintained with required calibration? Y/N	2	
5.	Provision of quality tested water ✓ Is the quality tested water provided in every building Y/N ✓ Is the quality tested water supplied consistently everyday through refills Y/N 2		
	Total	10	

3.3. Rainwater Harvesting in the campus 30 points

Rainwater is the main water from natural source. Every campus can harvest water depending upon the area in the campus. This area could be both paved area and unpaved. For the purpose of location-specific groundwater recharge and for harvesting efficiency, water collected from paved area is more efficient. It catches and provides higher quantity of water. But rain water is also universal carrier of waste on its route. It is essential to keep the rainwater route clean to ensure free flow of clean water and better recharge of rainwater. More water from paved area can be harvested in the campus when compared to unpaved area. For this, the following calculations and data are required.

- a. Area of the Campus Land:
- b. Institution's Paved Area:
- c. Institution's Unpaved Area:

Annual Rainfall in Metres (Rainfall in MM/1000) = Area of the Institution's Land x Annual rainfall in metres

Rainwater that can be harvested in an area can be arrived at by the following calculations:

- i. Paved area x Volume of Rainfall X 0.85(run off coefficient) +
- ii. Unpaved area x Volume of rainfall x Runoff coefficient (Runoff coefficient for unpaved area = 0.35)

X. Rainwater that can be harvested: Quantity of rainwater harvested is: i + ii = _____ (Litres per annum).

Y. Rainwater Harvested: a + b

- a. Unpaved area where rain water flow is channeled to the campus rainwater harvest point

Rainwater harvested in unpaved area
 ----- x 100 x 0.35*

Rainwater available for harvesting in unpaved area

- b. Paved area where rain water flow is channeled to the campus rain water harvest point

Rainwater harvested in paved area
 ----- x 100 x 0.85*

Rainwater available for harvesting in paved area

Scoring of points scored for rainwater harvesting are = Y/X x30

4. Greening

4. Greenery Rating

S No	Criteria	Maximum Points	Points scored
1	Area under green cover	66	
2	Campus Nursery Management	14	
3	Plant Protection Management	20	
	Total	100	

Our campus grounds provide excellent learning opportunities on plant and animal resources and the natural world around you on the campus map. Proper land use can transform our campus area into biologically diverse outdoor classrooms and healthy open spaces. Green area in the campus reduces air pollution and helps thriving diverse local species of plants and animals.

We need to measure the green area in the campus. To monitor the green area, we need to manage the green area on the campus.

The following are the steps: Calculate the percentage of green area on the campus.

a. 33% Area under Green Cover 66 Points @ 2 points per 1% of Green Cover

Find out the total land area available on the campus and fill in the table.

Table 4.1: Total land area occupied	
Description	Area in square metres
Constructed area	
Green area* inside the boundary	
Unconstructed barren area or others	
Total land area	

4.1 Area under Green Cover

*Green area includes any area which has grass cover, tree cover and horticulture. The total land area is _____

_____ square metres. Percentage of green area is:

$\frac{\text{Total green area in square metres}}{\text{Total area in square metres}} \times 100 \times 0.66$
Weightage: Green area carries 66 points.

b. Campus Nursery Management

14 Points

For initiating the campus nursery, the seeds from trees and shrubs in and around the campus are to be collected. Do they have the capacity to survive in the campus or are they native to the campus. They are to be planted in the campus nursery and kept under supervision of trained nursery manager. These saplings from the campus nursery are to be planted in empty and barren spaces, in and around the campus.

Table 4.2 Nursery Management

S No	Campus initiatives	Points	Management response	Scored
1.	Allocation of designated place for plantation	4		
2.	Maintenance of nursery with shade and water	4		
3.	Nursery staffed	4		
4.	Nursery strategy for campus and community plantation	2		
	Total	14		

c. Plant Protection and Plantation Management

10 Points

There is need for managing the protection of plants in the campus on a continuous basis. This is possible with continuous watch of the growth of the saplings and later the planted trees. Old trees which fall are to be replaced. Wherever there is a need for protection from pests and insects bio pesticide is to be administered. Wherever a sapling doesn't survive replacement plantation is to be done as a strategy.

Basing on the adoption of the strategies for nursery the following points can be given:

Table 4.3 Plant Protection and Plantation Management

S No		Maximum Points	Yes	No	Points Scored
1.	Plantation monitoring	4 Pt(if yes)			
2.	Plant support with bio fertilizers and water support	4 Pt(if yes)			
3.	Replacement plan for plantation	4Pt(if yes)			
4.	Controlled Bio pesticide administration	2Pt(if yes)			
5.	Locational Drip support	6 Pts(if yes)			
	Total		20 Points		

5. Energy Conservation

Campuses of Higher Education Institutions need to work on energy conservation. They consume very good quality of energy in good quantity. There is a need to utilise best quality energy for best use. Utilise solar drying and solar heating for those aspects which could be handled by direct access to sun’s energy. Many campuses are working towards energy conservation these days because it makes not only environmental but also economic sense. A systematic energy audit by the Swachh Student Team and recommendations of the Swachh Team would help the campus in framing energy policy for the institution covering both consumption and production of energy.

This item of work is given 100 points

- i. Percentage of solar energy produced as against consumed

For each percent of solar power replacing the conventional power, 2 points are allotted: Total Points-50

- ii. Total energy conserved as against last calendar year

For each percent of energy conserved as against the previous year, 5 points are allotted: Total Points- 50

Table 5 Campus Score in Conservation of Energy and Replacement with Solar Power

S No	Criteria	Previous year	Year under review	% of change	Maximum Points	Points scored
1	Total units of power				50	
2	Total units of Solar power				50	
	Total				100	

Case Study #1

National Institute for Rural Development and Panchayati Raj (NIRD&PR)

NIRD&PR is a 175 acres campus managed by the diligent and systematic work of participants, staff and residents. Their Swachh measures include - 4 bin culture, complete banning of plastic bottles and polythene bags on the campus, replacing disposables with durables, reducing paper waste to a bare minimum while operating a handmade paper manufacturing unit on campus, feeding the workers nutritious food with zero waste, and giving visibility to their message of Swachh all over the campus, to imprint it on the minds permanently. At NIRD&PR, scientific management of waste is ensured by adopting the cardinal principles of Reduce, Reuse, Recycle, Recover and Regenerate (5Rs). The Institute's Solid Waste Management Goal is: *Residual reject sent to landfill must always be under 10% of the total waste generated. 90% of waste should be reclaimed.* The steps followed are :

- 1. Survey on Waste:** Sources of waste generation, the quantum of waste generated from each source per day, per week and per month are noted. After segregation of waste its quantity is calculated.
- 2. Plan and Prepare:** 5R principle. The methods are non-intimidating, demonstrable and replicable using simple cost-effective tools and equipment. The waste is not transported to faraway places for treatment or disposal and the tools and equipment locally available. Preparation involves training everyone in scientific waste disposal, involving sanitation staff in planning and educating campus residents. Sanitation supervisor and staff are consulted for manpower requirements and deployment.
- 3. Facility, Equipment and Logistics:** This includes bins, collection carts, uniform, safety gear, gloves and rakes for handling different kinds of wastes are provided at different locations. There is a hazardous waste management facility with an incinerator, compost bins. There is a facility for sanitation workers to wash and clean. Bins, carts, vehicles in their most appropriate sizes and place at different locations with colour coding for easy transportation of waste.
- 4. Segregation of Waste for Secondary Segregation and Resource Recovery:** Covered sheds are located away from each other to avoid mixing. Shredders, sieves and other mechanical devices are provided. Collected waste is checked for proper suitability before treatment. Tertiary segregation recovers recyclables and reusable wastes.
- 5. Refuse - Reuse - Recycle - Recover - Regenerate:** Important practices include total ban on single use items like plastic bottles, disposable plates and toiletries in sachets, reduction in paper use, sharing notes and documents. Recyclables like e-waste, glass and plastics are given to scrap collectors.
- 6. Waste Treatment & Management:** The NIRD prepared a technical management matrix indicating steps and stages in solid waste management with techniques and tools for each stage.

7. **Monitoring and Correctives:** Feedback and complaint box are provided to report regularity of sanitation staff for each source. Complaints are addressed on a daily basis, with physical verification and a positive approach. Non-compliance and non-cooperation are tackled by counseling and are fined to the tune of Rs. 5000 per month.
8. **Signage, Hoardings and Planting Tree Saplings:** Trees are planted by every visiting VIP. Signages and hoardings declare the benefits and steps to a clean environment.
9. **Welfare of the Sanitation Workers:** Sanitation workers are paid well and given uniform, gloves, masks and shoes, and proper training from time to time. A monthly health check-up and addressing of their grievance is also conducted.
10. **Reporting Mechanisms:** The staffs maintain record of daily collection of waste, and keeping in view the initial sample figures, they generate information on the volume of waste prevented (e.g. by banning plastics), reduced, recycled and regenerated (methane produced).

Source: '10 steps to a Swachh campus', Centre for Rural Infrastructure (CRI), NIRD&PR, Rajendranagar, Hyderabad – 500 030, www.nird.org.in

Case Study # 2

Manipal Institute of Technology

Waste Water Management

Manipal Institute of Technology, Karnataka scrupulously adheres to the 3 R's: Reduce, Recycle, Reuse. Three sewage plants treat 5,500 cubic meters of waste water per day are run by MAHE. Treated water is fully utilized for gardening and arboriculture. In addition, a sullage treatment plant treats around 200 cubic meters of grey water per day from the treatment plant which is re-circulated to the flush system in few hostel blocks.

Rainwater Harvesting

Rainwater is harvested from a catchment area of 27, 250 sq m. Rainwater from rooftops is filtered and used for domestic purposes. Storm water is diverted to 11 abandoned bore wells to improve the water table. For recharging dry bore wells, a pit is excavated around the bore well and a filter medium is filled into the pit. This has led to self-sufficiency during water stress periods.

Air Quality Monitoring

Emissions from diesel generators are further tested in-house at regular intervals to ensure conformity to environmental standards. A government-recognized Emission Testing Centre is located on the campus at subsidized rates, to encourage self-compliance by private vehicle owners. Open spaces are developed through arboriculture and greenery.

Energy Conservation

MIT's energy procurement mix has an increase in renewable sources like solar energy.

Air-conditioning systems with power-efficient star rated units, state of the art water cooled screw chillers, and sensors for efficient cooling and automatic switching on and off depending on occupancy and fixed time schedule are installed replacing old systems. Environment-friendly gas systems are used in all cooling systems. Energy efficient transformers, pumps, detuned filters for capacitor banks, and CFL /LED lighting; auto synchronization panels for load optimization and energy efficient power equipment as certified by Bureau of Energy Efficiency (BEE) are utilised. Solar water heaters are exclusively used for the heating requirements. Currently, the total installed capacity of solar heaters is four lakh liters per day.

Roof top solar photo voltaic (PV) systems on four buildings in the first phase with a capacity of 525 kilowatts peak (kWp) in September 2015 make up for 30% of the energy needs met by renewable means.

Solid Waste Management

Food Waste is sent to piggeries, while other organic waste is vermi-composted. Hazardous waste generated out of the maintenance activity of vehicles & DG Sets – disposed to Authorized recyclers. E-waste too is disposed to authorized recyclers. Construction debris is put in a designated landfill on campus. Biomedical waste generated in the hospital and nursing facilities within the campus is segregated at source in a strictly-implemented regimen and sent to a central unit. Authorized agencies collect it at regular intervals to treat and dispose of in a safe manner.

Source: <https://manipal.edu/mu/important-links/green-manipal.html>



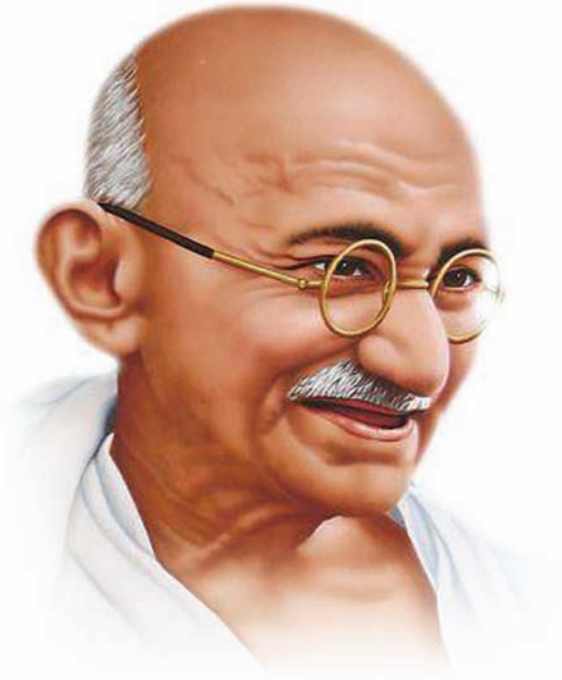


Master Plan for Swachh Campus Initiative

Strategies Proposed for Bringing Environmental
Sustainability to Campuses of Indian Universities and
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JULY 2018

A Project of the Higher Education Department
Ministry of Human Resource Development
Government of India



Mahatma Gandhi National Council of Rural Education

Department of Higher Education

Ministry of Human Resource Development, Government of India

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