Sustainability Initiatives at CHARUSAT

CHARUSAT strives to provide a unique learning environment that involves understanding of the environment protection and relating it to issues of a local area and using student's skills and knowledge to conduct research and executing best sustainable practices.

CHARUSAT does this by intersections of environment and learning that develops responses and interventions to advance the wellbeing of both students and the environment.

The various initiatives profiled here provide opportunities for innovation, research, analysis, and partnership, and it is expected that not only that they will be sustained at the CHARUSAT campus, but that they will help to inspire similar efforts on other campuses in the years to come.

Following are environmentally-friendly campus facilities, socially responsible and equitable work policies and work environments adopted at CHARUSAT.

1. Environmental (Sustainability) Policy

CHARUSAT drives the social and sustainable responsibilities in its operations and curriculum by its commitment to preserve the environment. It is committed to a Clean & Green Campus.

CHARUSAT will endeavor to exceed its environmental performance improvement and will:

- Support and fully comply with the requirements of relevant statutory bodies
- Follow appropriate regulations and codes of practices
- Reduce, Reuse and Recycle the campus waste to the maximum extent possible
- Use energy and water as efficiently as possible
- Apply the principles and knowledge of environmental engineering for welfare of the local community

2. Ban on Single Use Plastic and Restricted Use of Plastic Items

Based on the guidelines of UGC and AICTE, CHARUSAT proposed the strategic Action Plan on Plastic Waste Management which will be taken up in the following order:

- Reduce
    - *Banning the use of disposal/ single use plastics in campus premises*
    - *Minimize buying Packaged Drinking Water*
- Reuse
    - Reuse of the plastic items shall be promoted on campus and plastic scrap shall be evaluated for all possible re-usability before being sent for recycling.
- Recycle
    - *Waste plastic to recycled plastic*
    - *Waste Plastic to Fuel (Pyrolytic Conversion Technologies)*
- Disposal
    - *Waste Incineration*

3. Water Conservation

CHARUSAT works towards developing water use efficiency and conservation strategies by

- Monitoring and reducing the University's water consumption
- Planting indigenous plants to minimize water uptake
- Maintaining natural Water body available in campus premises
- Rain Water Harvesting
- Drip and Sprinkler Irrigation

4. Waste Management

- **Solid Waste Management:**
  The Solid Waste from generated from the various department and institutes of CHARUSAT mainly consist of Papers, Packaging (Plastic) material, cardboards and waste food in a small quantity. The other major source of the solid waste is garden waste such as dried leaves and green cuttings. CHARUSAT has developed a practice of segregating waste at its generation and has provided the two bin system (i.e. Dry Waste and Wet Waste) in all buildings. The waste dry waste is then taken to the Incinerator for burning under controlled conditions. Thus the dry waste is managed by controlled burning. The Wet waste

along with Garden waste is put in the open pits for natural decomposition in the due course of time.

- **Liquid waste management**

  CHARUSAT has installed a 100 KLD capacity Integrated Wetland System for the treatment of Sewage. The quality of treated effluent is well within stipulated limits by pollution control board. There are total 34 Soak Pits/ Septic Tanks installed underground for the final disposal and management of sewage generated from the respective buildings.

- **Biomedical waste management**

  The Biomedical waste generated from CHARUSAT hospital is segregated in various categories and the sent to M/s Samvedana BMW Incinerator (Unit-II), Tarapur (GPCB authorized CBMWTF) for further management.

- **E-waste management**

  The e-waste from campus is supplied to the authorized vendor dealing with the recycling of the e-waste for further management.

- **Waste recycling system**

  Reduction and reuse of the item is always a high priority of CHARUSAT. Paper being major waste material, emphasized is given on recycling of it. All newspapers waste generated from various institutes are used for making Paper Pens. Paper pens is one of the unique initiative of CHARUSAT in collaboration with Center for Environment Education, Ahmedabad which is a center of excellence of GoI. Also, Digital Paperless Exams are started in year 2019 in order to save papers.

- **Hazardous chemicals and radioactive waste management**

  The hazardous chemicals and radioactive waste generated from various constituent laboratories is sent for safe management to the GPCB authorized Transfer, Storage and Disposal Facility (TSDF) at Nandesari Environment Control Ltd. (NECL).

Fig 1. Segregation of Dry and Wet Waste inside institutes building

Fig 2. Segregation of Dry Waste in campus premises

Fig 3. Incineration plant installed for plastic and related waste

Fig 4. Compact STP plant installed at CHARUSAT Hospital

Fig 5. Integrated Wetland System for Sewage Treatment at CHARUSAT

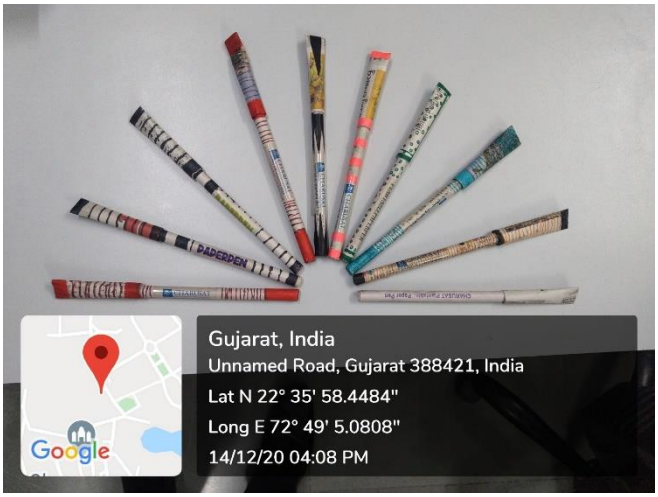

Fig 6. Paper Pens from Recycled Newspapers/ Waste Papers at CHARUSAT

5. Energy Efficiency & Conservation

CHARUSAT is committed to implement energy efficiency measures to lower consumption of non-renewable energy through energy saving activities and practices

- Solar based power generation on Campus
- LED and sensor based lighting system for energy saving
- Maximum use of natural light and ventilation

Fig 7. Solar Power Plant/ Panels Installed at CHARUSAT CL/ME Rooftop

6. Transportation

CHARUSAT strive to promote sustainable transportation by

- Promoting use, wherever possible of efficient public transport, walking, bicycles and car-sharing/pooling etc.
- Discouraging unnecessary use of both private and university vehicles to reduce traffic and parking issues on campus
- Restriction on the entry of the outside vehicle in the campus

7. Quality Audits on Environment and Energy

- The Green Audit of the campus is conducted once in a three years by the Civil Engineering Department, CSPIT
- The Environment Audit of the campus is conducted every year by recognized Environment Auditors
- The Energy Audit of the campus is conducted once in three years by the Electrical Engineering Department, CSPIT

8. Green Activities, Events, Programs

- Tree Plantation Drives
- Celebration of World Environment Day

- Digital Paperless Examination
- Organizing workshops, training programs and Knowledge Sharing
- Technology and Knowledge Sharing with Centre for Environment Education (CEE), Ahmedabad

9. Environmental Initiatives in Academic Programs

- University offers different courses in the field of Environment such as:
    - Environmental Sciences (All Programs 1st /2nd /3rd Semester)
    - Environmental Sustainably & Climate Change (All Program 3rd Semester)
    - Basics of Environmental Impact Assessment (All Program 4th Semester)
    - Air Pollution and Control (Civil Engineering-5th Semester)
    - Environmental Engineering-I (Water Supply Engineering, Civil Engineering 6th Semester)
    - Environmental Engineering-II (Wastewater Engineering, Civil Engineering 7th Semester)
    - Environmental Pollution & Control (Focusing on Industrial Pollution Civil Engineering -7th Semester)

- SDG Handprint Lab: The SDG Handprint Lab aims at familiarizing students with Sustainable Development Goals of United Nations, facilitating development of understanding their significance and getting them to take action at the local level.

10. **Community Initiatives**

- Students are encouraged to work with the local communities of the adopted villages by CHARUSAT's Rural Education Development Cell in areas like solid waste management, reduction of plastics use, and conversion of plastic waste as well as paper waste to more valuable products
- There were also studies of environmental health problems in the local communities and steps needed to mitigate these problems. A closely related area is

"Environmental Service-Learning" whereby student interns could learn about environmental problems while studying the environment of local communities.

- 7th Charotar Crocodile Count in the Wetlands of Anand and Kheda Districts is being organized during January, 2020.
- *6th Charotar Crocodile Count in Wetlands of Anand and Kheda Districts, January 2019*
- 5th Charotar Crocodile Count in Wetlands of Anand and Kheda Districts, January 2018
- Petlad Nagapalika's Waste Management and Plastic Pyrolysis plant study
- Swatchta Action Plan in CHARUSAT adopted villages in July 2020
- Recycled Paper Pen making training to nearby village women

Fig 8. Recycled Paper Pen making training to rural women in nearby community

Fig. 9 Visit to Petlad Municipality to study their Waste Management Practices

Fig 10 SDG Exhibition for spreading environment awareness among local community

11. Floral and Faunal Diversity (to be provided by Dr. Mandar Kulkarni)

12. Sustainability by the numbers

- CO_2 Absorbed by Green Cover/ Trees: 6789.27 Tons/ Year
- CO_2 Emission Saved from Digital Paperless Exam: 26.39 Tons / Year
- CO_2 Emission Saved from Solar Power Plant: 6.12 Tons / Year
- Carbon Negative based on Net Carbon Emission considering Direct Emissions
- 43% of Total Rain Water (162844.88 $m^{3)}$ harvested on campus
- Percentage Area Under Green Cover: 70.97 %