



VIT[®]

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

SDG 6 Clean Water and Sanitation

Annual Report 2018-19

6 CLEAN WATER AND SANITATION



Ensure availability and sustainable management of water and sanitation for all

Vellore Institute of Technology

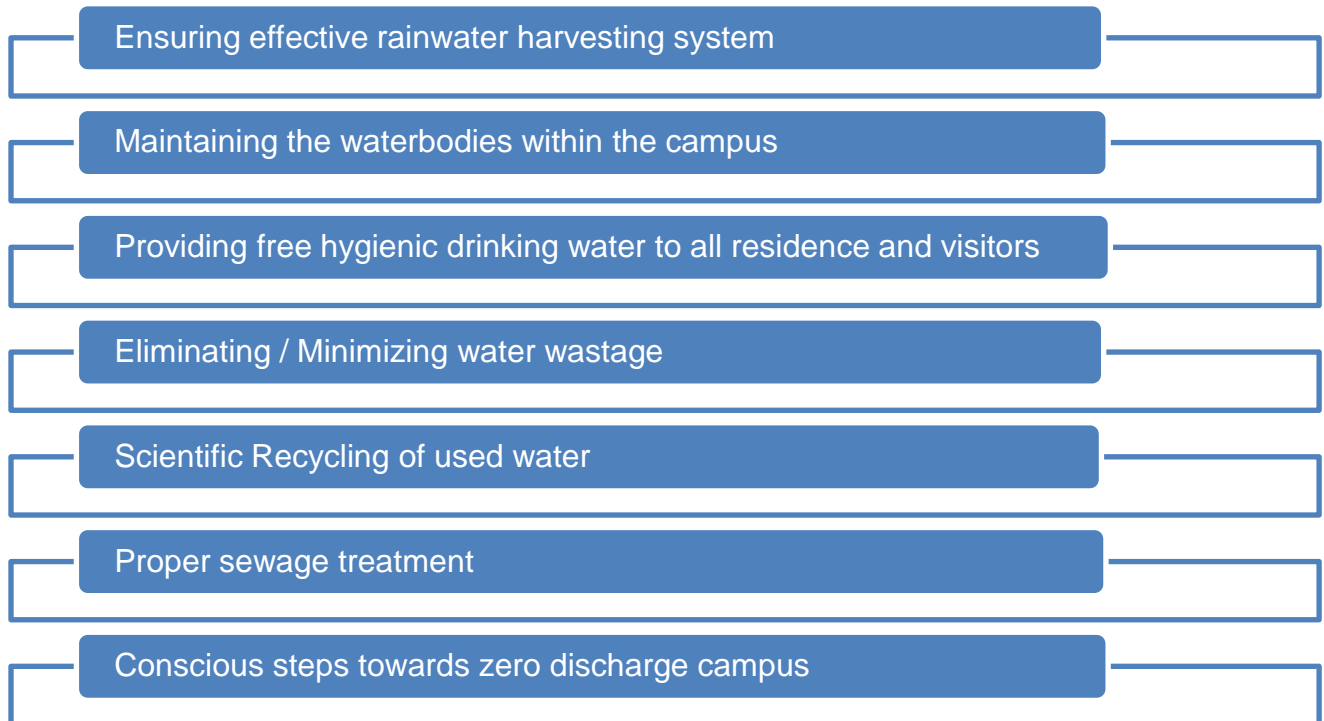
Vellore – 632014
Tamil Nadu, India
www.vit.ac.in

Report of VIT-Vellore Campus

GOAL 14: Clean Water and Sanitation...

Water is the prerequisite for life as we perceive it today. The development of human civilisation is closely tied to the water sources. In the modern times the need for Clean Water and Sanitation is all the more significant and it is a most important metric indicating the level of human civilisation.

VIT is committed to respecting the significance of water. Over the years of its growth, the institution has developed a series of measures to make a sensible use of this invaluable resource. Some of policy decisions in this direction include.

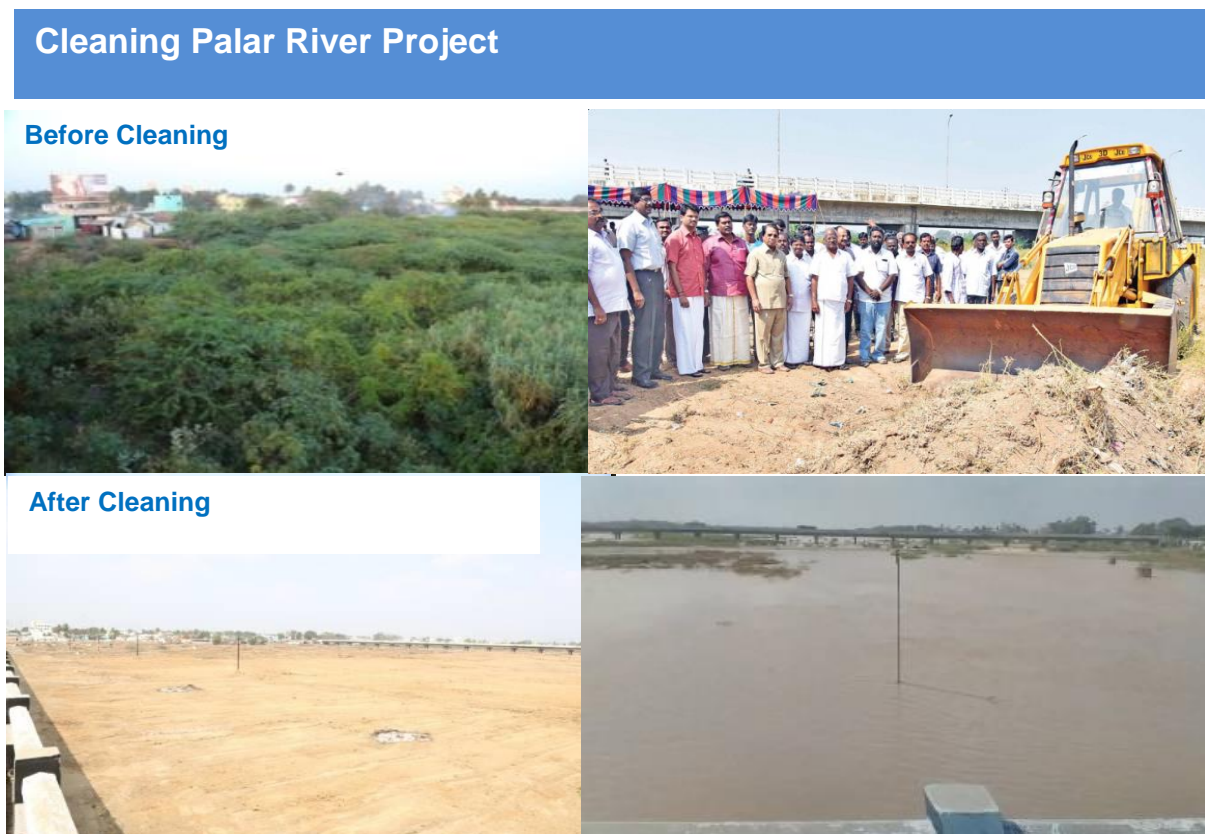


Some of the major initiatives taken by the institute towards Clean Water and Sanitation in 2018-19 are

- Organising an international countenance on Innovative and Emerging Technologies for Farming, Energy & Water during 12th – 14th October 2018.

- Water conservation week from 18th to 22nd March, 2019 in the Vellore campus to spread the awareness among the campus inhabitants and people around
- Cleaning of water bodies in the neighbourhood in Chennai campus

Consistent with its belief, the Institute has taken a major initiative in 2018-19, to clean a major water body in its neighbourhood - the Palar river. There was a large growth prosopis juliflora along the river bed. Being an invasive plant, the growth was very rapid and it also played a significant role is depleting the ground water resources. VIT took up the task of clearing the river bed and the cleaning of the river bed for about 1.06 million sq.m was cleared in two phases.



The view of the riverbed before and after cleaning

This initiative was well recognised by the local population and by the government of Tamil Nadu recognised the initiative by “Green Award”.



Institution's Vice President Receiving Award from the Chief Minister of Tamilnadu, India



The Green Award Received on 04.06.2018.

Report of VIT-Chennai Campus

PREAMBLE

Climatic changes, population explosion, and urbanization have a dramatic effect on natural environment. The climate change leads to major changes in the availability of clean water because of unpredictable rainfall patterns, intense high energy events which results in the risk of flooding, affecting the land and marine regions. In coastal area, salt water intrusion is a major problem because of unsustainable ground water extraction. Due to urbanization, elimination and dumping of chemical waste and sewage to the water contaminates the water and quality for beneficial uses is compromised. Overexploitation of natural resources makes the availability of clean water at risk.

SUSTAINABLE PRACTICES of VIT involves in various practices adopting the green policy. The green initiatives promote sustainability in the institute. The energy conservation facilities, water conservation, water recycling facility, green building, source segregated solid waste collection and processing, and green campus landscape contribute to the development and maintenance of the campus as a green campus. Sustainability is the core of the campus infrastructure.



An artificial lake for Rainwater harvesting Wastewater Treatment and Reuse Plant

RAINWATER HARVESTING

Appropriate rain water harvesting methods are practiced in the campus to save water. An artificial lake is constructed in the campus to collect the water from storm water drains. The overflow from the lake is connected to the other ponds in the campus so that the entire rainwater is harvested and conserved. The roof top water during the rain was collected in the underground storage tanks and was used as stored water for firefighting purposes. Also, landscaping of the campus was done with few depressions and small mounts and by cultivating grass / small trees and plants over the ground to reduce the run-off and ultimately increase the ground water re-charge.

RECYCLED TREATED WATER FOR GARDENING/LANDSCAPING AND FLUSHING OF TOILETS

All the wastewater generated in the campus is collected and conveyed to a modern wastewater treatment plant and treated to a satisfactory level to recycle the water for gardening/landscaping and flushing of toilets. This helps in conserving the water to a great extent and helps in recharging the groundwater, which is the main source of water supply in the campus. Also, the nutrient and water value of recycled water is of great help in building the campus green. The recycled water is sprinkled to apply the optimal water for irrigation and thereby avoiding the water logging in the campus.

WATER SUPPLY

The water supply in the campus is done by drawing ground water from 11 numbers of open dug well and 4 numbers of bore wells. First the water would be pumped to the firefighting tank and the overflow would be taken to the domestic water tank. This operation ensures ever ready situation for firefighting in case the need arises. The water from the domestic tank would be pumped to overhead tanks for general purpose use. For drinking purposes, the water from the domestic water tank is treated in Reverse Osmosis (RO) plant housed in the top of buildings before supplying to users.

SUSTAINABLE WATER USE

Many invited lectures were organised on Water Issues Related to Thermal Power, Desalination Techniques in Water Purification, Desalination Techniques- An Overview, Lectures by Indian Coast Guard- Pollution Control Unit (Pollution Response Team) & Indian Coast Guard (ICG) Ship, Chennai Port Trust, Indian Meteorological Department for creating awareness among students and faculties. Several Guest lectures were organised on Zero Liquid discharge system on a tannery effluent treatment plant (Conducted for industrial effluents treatment and disposal and pollution control and monitoring classes and Solid waste management. As a part of curriculum the students were taken to Chembarambakkam water treatment plant, Ambur tannery effluent treatment plant, Perungudi Sewage treatment plant, Koyembedu and Sewage treatment plant at Chennai. As a part of curriculum, the following courses on Industrial Wastes Treatment and Disposal, Pollution Control and Monitoring, Water Resource Engineering and Solid Waste Management has been offered.

VIT Chennai is a part of DST-IITM Water Innovation Centre for Sustainable Treatment, Reuse and Management for Efficient, Affordable and Synergistic Solutions looking into a sustainable approach for water resources protection and augmentation through wastewater treatment and reuse and storm water management. Centre for Sustainable Treatment, Reuse and Management for efficient, affordable and synergetic solutions for water (Water-IC for Sutram of EASY WATER). The research group of VIT Chennai is working on Nutrient removal/ recovery from wastewaters, Recycling and Reuse of wastewater, Bioremediation of contaminated water and soil, Green building materials from waste, Waste to energy by biogas production (CH₄) and Hydrogen, Industrial effluent treatment for disposal and resource recovery, Groundwater treatment (F-, As, Mn, Fe, NO₃⁻, etc), Physico-chemical treatment of water and wastewater, Odour control by biofiltration, Biological processes for treatment of wastewaters, Bio-solids treatment and management, Nano and nanocomposites for environmental remediation, Solid waste, landfill liners and contaminant migration, Optimization algorithms in water resources, Surface and ground water modelling, Numerical modelling, Hydrologic

modelling, Irrigation and water resources management, Soft computing applications in water resources engineering and development of affordable, robust disinfection system for rural India.

The researchers of VIT presented the work on International conferences on “Water Balance Model for Chittar River Basin, Tirunelveli District, Tamilnadu, Water Balance Model for Chittar River Basin, Tirunelveli District, Tamilnadu, Assessing the problems in Agriculture in Indian context for farmers with small holdings and potential remedies, Assessing the problems in Agriculture in Indian context for farmers with small holdings and potential remedies, Water Issues in Thermal Power Plants, Coastal and Brackish water Aquaculture and Entrepreneurial Opportunities, Two Day Indo-Australia Workshop on Water scarcity and ways to reduce the impact, Developing Hydro-Climate Science, Information and Services for Water Management, Concrete for Under Water Tunnel, Reference Module in Materials Science and Materials Engineering-Polymer-Water Interfaces, Soil Water Balance model over the Chittar Subbasin, Tamilnadu using SWAT, A New Optimal 3D Mesh model watermarking based on Weber Law, Nano Technology, Food security and water treatment / Physical, Chemical and Biochemical Biosensors to Detect Pathogens, Assessment of Nonlinear Quadruplet Interactions for measured spectra in deep waters on the East coast of India through Gauss Legendre Quadrature method and assessing the problems in Agriculture in Indian context for farmers with small holdings and potential remedies.

WATER PURIFICATION

The Environmental Engineering research group in Civil Engineering is involved in developing appropriate techniques/processes for water water purification. The “Development of affordable, robust disinfection system for rural India”, a Department of Science and Technology Project initiated by Dr. S.M. Maliyekkal and Dr. P.C. Sabumon, aims at providing sustained access to clean drinking water at the Point of Use (POU). It is the mammoth task to supply palatable drinking water to a large population in rural settings and has been identified as the key challenges in the Millennium development goals of United Nations. World Health Organization (WHO) reports that there are about



3.275 million deaths occurred over the world due to drinking water related infections. The research work is focused on developing a film with antibacterial property consists of biopolymer template with reinforcing agent decorated with silver nanoparticles through an eco-friendly method. The nanocomposite showed excellent antibacterial property against gram positive and negative bacteria. The significant 99.9999% disinfection of E.coli for multiple cycles and the sustained, controlled release of silver ions make this nanocomposite material a promising candidate for the disinfection of drinking water, PV fed Water Pumping System in a Smart Home. The developed process has been patented and published for public to access the process knowhow. The group also developed process know for ammonia removal from wastewaters in order to protect surface waterbodies from eutrophication by executing two sponsored projects from Department of Science and Technology, Govt.of India. The developed processes have been patented and published for public to access the process knowhow.

- - -