



# VIT<sup>®</sup>

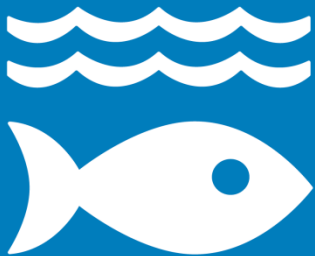
**Vellore Institute of Technology**

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

# SDG 14 Life Below Water

## Annual Report 2018-19

**14** LIFE  
BELOW WATER



Conserve and sustainably use the oceans, sea and marine resources for sustainable development

**Vellore Institute of Technology**

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## Report of VIT-Vellore Campus

### GOAL 14: Life Below Water...

The ecosystem of our planet Earth majorly depends on the oceans. The oceans provide and regulate our rain water, the Oxygen we breathe, drinking water, weather, and climate. Saving our ocean must remain a priority. Marine biodiversity is critical to the health of people and our planet. Marine protected areas need to be effectively managed and well-resourced. Regulations need to be put in place to reduce overfishing, marine pollution and ocean acidification.

Vellore Institute of Technology (VIT) is working hard to prepare the student community and to make them understand and appreciate the importance of the marine diversity. Faculty community is also being continuously encouraged to work in areas that contribute to the uplift of the marine biodiversity. VIT also periodically conducts technical conferences, workshops and seminars on water conservation and management techniques. VIT encourages faculty and student to reduce the usage of plastics which often gets dumped in to the aquatic systems affecting the biodiversity. As a part of this initiative and to set an example to the society, VIT have declared the campus as plastic free campus and prohibits the usage of plastics inside the campus. Vellore Institute of Technology is also maintaining a big lake inside the campus where the rain water collected from various parts of the campus are filtered and channelised in to the lake.

Vellore Institute of Technology as a part of its outreach activities has conducted an Public awareness rally on Afforestation and Conservation of Native Plants & Water Bodies through the students of National Service Scheme (NSS). NSS is a Central Sector Scheme of Government of India, Ministry of Youth Affairs & Sports. VIT has taken a great initiative in cleaning the River Palar, which is one the primary river flowing through Vellore, has a part of it social responsibility in preserving the water bodies.

Faculty of VIT has involved themselves in various sponsored research projects related to marine diversity over the past 5 years. Some of the projects are:

- Image processing techniques for extracting ocean features from satellite imagery, a project sanctioned by DRDO, Government of India
- Bye-carbonate: Engineering Pro chlorococcus to tackle ocean Acidification, a project sanctioned under DBT, Government of India
- Prediction of extreme severe cyclonic storms over North Indian Ocean using high resolution numerical modeling system for disaster preparedness, a project sanctioned under DST, Government of India
- Formulation, Characterisation of Biobased Oil Nanoemulsion Towards Controlling Bacterial Infection in Aquaculture (Special Reference to Fish and Shrimp), a project sanctioned under DST, Government of India
- Antioxidant and antibacterial activity of seaweeds against fish bacterial pathogens, a project sanctioned under DST, Government of India.
- In vitro and in vivo Antimicrobial efficacy of polymer and semiconductor nanoparticles and its based nanocomposites against and fish pathogens, a project sanctioned under DST, Government of India
- A marine analogues and its membrane damage mechanism on fish pathogens-design and Chemical transformations of penipanoid C and Luotonin F, a project sanctioned by Vellore Institute of Technology.
- Probiotics as a feed for enhancing growth and diseases resistance in freshwater prawns *Macrobrachium rosenbergii*, a project sanctioned by Vellore Institute of Technology.
- Destruction of Recalcitrant Amoxicillin by an Integrated Clean Chemical and Biological Treatment of Wastewater, a project sanctioned by Vellore Institute of Technology.
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- Synthesis of Novel Graphitic Carbon Nitride Nanostructures for Degradation of Pharmaceuticals in Water and Waste Water, a project sanctioned by Vellore Institute of Technology.

- Impounding of River flood waters along Dakshina Kannada Coast A sustainable strategy for water resource Development, a project sanctioned under DST, Government of India
- Spatial distribution of water quantity parameter in Dakshina kannada, Hassan and Tumkuru region, a project sanctioned under BRNS, Government of India.
- Feasibility of river bank filtration for rural water supply around check dam in non-perennial rivers, a project sanctioned under DST, Government of India.
- Preparation of biogenic bimetallic core shell PdFe nanoparticles for wastewater bioremediation applications, a project sanctioned under DST, Government of India.
- Marine Nutraceuticals for controlling bacterial infection in aquaculture, a project sanctioned by Vellore Institute of Technology.
- Construction of Polyketite Synthase, Non Ribosomal synthetase gene library and natural product library from cultivable and uncultivable marine actinoycetes for Bioprospecting, a project sanctioned under DBT, Government of India.

VIT has committed itself and has always encouraged faculty, student and other stakeholders in protecting the biodiversity of the water bodies in all possible ways.

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## Report of VIT-Chennai Campus

### PREAMBLE

The Ocean is crucial for sustainable life on Earth and people depend on it to survive. Oceans provide billions of people with food for their livelihoods, more than half of the oxygen that we need to breathe, and it regulates our planet's climate and weather. Yet Oceans' health is deteriorating due to increasing levels of garbage. This affects the marine biodiversity and has a huge impact on the environment and economy. Much needs to be done to preserve this crucial resource for a sustainable future.

### INTERNATIONAL COASTAL CLEAN-UP DAY

“All the King's horses and all the King's men will never gather up all the plastic and put the Ocean back together again” – Charles Moore, Marine Researcher

Our Oceans are polluted like never before and our coastal areas have lost its sheen due to plastic garbage. As an initiative towards sustainable development, the International Coastal Clean-up day was organised by National Service Scheme, VIT Chennai in association with Indian Coast Guard. The student volunteers of NSS cleaned the beach and segregated the material collected as bio-degradable and non bio-degradable. This clean-up process is a step towards mitigating pollutants especially non-biodegradable materials such as plastic which pollute Ocean / Sea and affects marine life.



## RESEARCH GRANT

Faculty from School of Civil Engineering has received a research grant from Science and Engineering Research Board, Department of Science and Technology, Govt. of India for the project titled “A high-resolution multi-proxy record of Neogene and paleoceanographic evolution of Southern Ocean link to Global climate change”. Researchers have increased their interest to understand association of benthic foraminifera to methane rich environments and relation between benthic foraminifera and gas hydrates sequence to understand the faunal trends and linkage between species assemblages, gas-hydrate environment and global climate changes. Benthic foraminifera are applied as proxies for oxygenation, depth and organic flux. Planktic foraminifera are the most important microorganisms used for surface paleoceanographic reconstructions. High concentration of certain species like *Globigerina bulloides* mirror upwelling conditions in the tropics. The seasonal monsoonal upwelling is a prime determinant of oceanic primary productivity, and promotes the blooming of distinct faunal and floral groups.

## INDO-KOREA JOINT WORKSHOP

Faculty from School of Electrical Engineering had participated in the Indo Korea Joint Workshop on Wave and Ocean Thermal Energy Conversion at IIT-Madras. The main objective of the workshop was to bring the like-minded researchers to discuss and present their works and provide a platform for research collaboration among organizations which focused on Wave energy & Thermal Energy Conversion.

## AWARENESS PROGRAMMES

A guest lecture on “Renewable Energy Sources and ocean renewable energy research” was organized by the School of Electrical Engineering. Dr.Biren Paatanaik, Scientist-D, Energy and Fresh Water, National Institute of Ocean Technology-Chennai, discussed about the utilization of the ocean resources to find alternative technologies for fresh



water and renewable energy. The lecture focused on developing sustainable technologies for tapping renewable energies and generating fresh water from the ocean.

Dr. Victor Simon Chandrasekaran, Adviser, Principal Scientist (Rtd) & Scientist-in-Charge, Social Sciences Division, Central Institute of Brackishwater Aquaculture (ICAR-CIBA), Chennai, delivered a lecture on “Coastal and Brackishwater Aquaculture and Entrepreneurial Opportunities”. The lecture was oriented towards using Brackish water regions into sustainable farming grounds for aquaculture. Dr.Victor explained about farming Pear, shrimps and edible fishes in brackish water regions. so that actual disturbances to the marine environment shall be reduced. Students were made aware of how pearls, shrimps and fishes can be grown in brackish water which is actually considered to be a region of no scope and reduce the stress rendered to the actual marine environment so that marine aqua environment can be conserved as well as cater to the human needs.

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