SUSTAINABLE DEVELOPMENT GOALS – 14

LIFE UNDER WATER

14.2 Supporting aquatic ecosystems through education

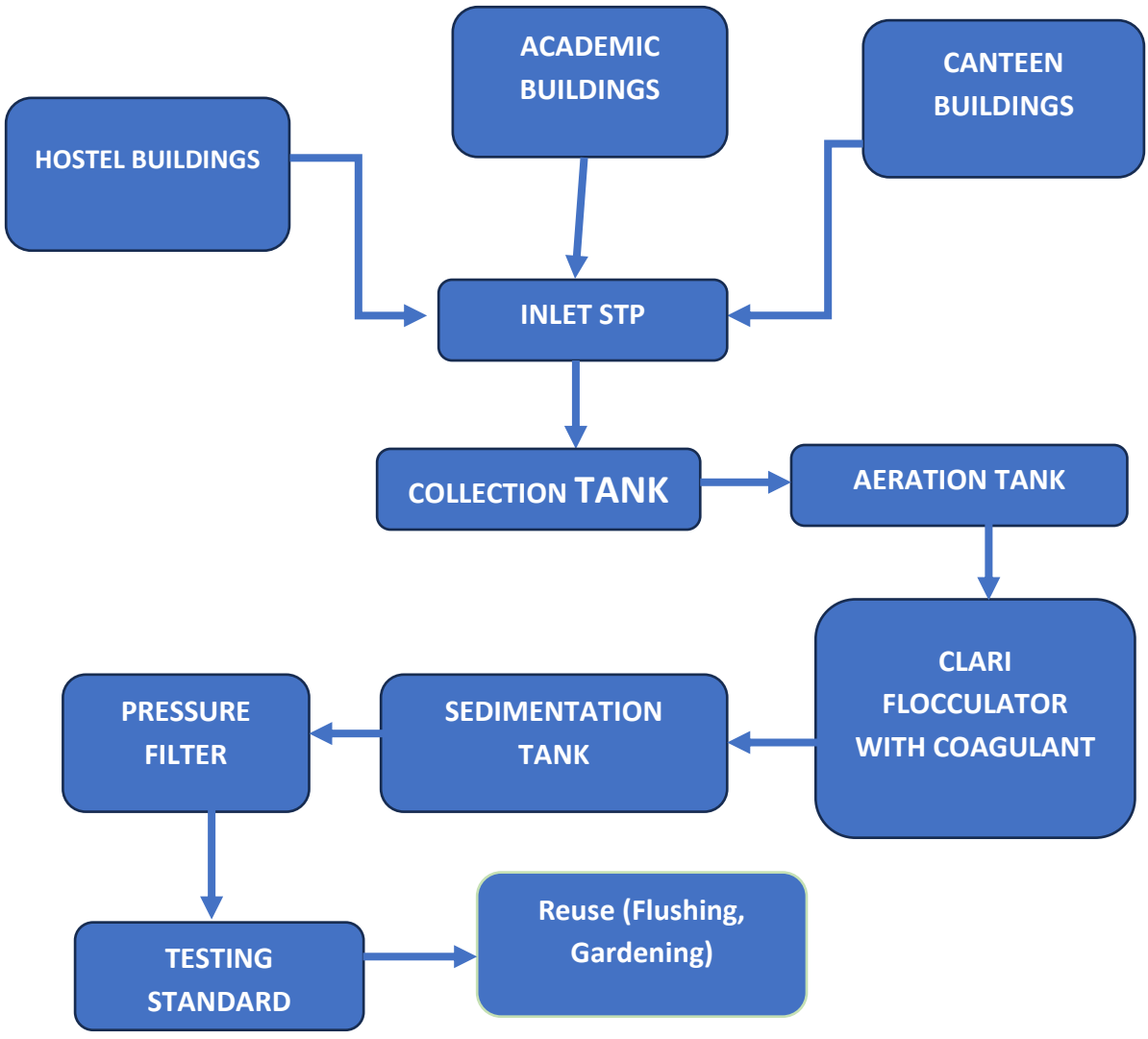
14.2.1 Waste Water Treatment Plant

Wastewater Treatment Plant

An efficient wastewater treatment facility with the capacity of 2,75,000 litres per day is established in campus to treat all wastewater generated from academic, residential, and research buildings.

Promote Wastewater Reuse and Recycling

Recycle treated wastewater for campus needs, such as landscaping, toilet flushing, and cooling systems, to reduce freshwater consumption and wastewater discharge.



Flow Chart -Process of Collection, Treatment and Reuse

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Pressure Filter Units

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Aerators

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Filter Feed, Clarifier and Sludge drying Beds

Water Re-use Measurement

Sewage treatment tank capacity = 275,000 litres/day

Volume of water consumption: 129,261,000 litres/year;

Per day water inlet to STP plant: 271,748 litres;

14.3 Supporting aquatic ecosystems through action

14.3.1 Preventing Water System Pollution

Preventive Actions Involved:

The Institute's plumbing system, which collects water from the respective bore-well and then transports it to the treatment unit and supply, has been carefully designed and put into place. The water is conveyed safely, and the pipes are installed at an appropriate gradient. It is also made sure there were no leaks in the water pipelines by regularly inspecting them. If there is an issue with the water pipes breaking due to an accident, they will also need to be replaced every once monitored. Similarly, different sewer pipelines carry the wastewater that is collected from the institution's numerous locations. There are enough manholes at many intersections to do pipeline inspections. The function of the valves installed in the sewer pipelines is also examined, and necessary maintenance is performed. Additionally, the treated

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wastewater is used for gardening and flushing while being carried securely. Water and sewer lines can be easily distinguished from one another thanks to distinct markings on the plumbing lines. By taking these steps, the Institute has been able to control the wastewater produced on the property and keep it out of the water pipelines and other water sources.




14.3.2 Beach Cleaning

Organize Regular Beach Clean-Up Drives

Conduct regular beach clean-ups involving CIT students, faculty, and staff to reduce marine pollution and maintain the cleanliness of nearby beaches. Partner with local environmental organizations, schedule clean-up events at popular beaches (such as Marina Beach and Besant Nagar Beach), and collect and safely dispose of waste, especially plastics and other non-biodegradable items.

Establish a Beach Waste Data Collection and Monitoring Program

Collect data on the types and quantities of waste found during beach clean-ups to identify major pollutants and track the effectiveness of clean-up efforts. Organize teams to categorize and weigh collected waste, and share findings with local authorities and environmental groups to inform broader waste management policies.

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14.3.3 Promote a Plastic-Free Campus and Community Awareness Campaign

Reduce single-use plastics on campus and promote awareness in the surrounding community to limit plastic use, which often ends up as beach litter. Launch awareness campaigns on campus, collaborate with local shops and communities to reduce plastic usage, and educate students and staff on alternatives to single-use plastics, such as cloth bags and refillable water bottles.

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Other Details

I. Student Projects contributing to SDG14:

Encourage students to participate in wastewater treatment and environmental sustainability projects as part of their academic learning and social responsibility. Provide opportunities for students to work on real-world wastewater treatment challenges, conduct research on innovative treatment solutions, and participate in events related to SDG 14.

Title: DESIGN OF WAVE TANK AND HYDRO DYNAMIC EVALUATION OF FLOATING PLATFORMS FABRICATED WITH REPURPOSED HDPE WATER CANS

Abstract:

This project focuses on exploring floating platforms constructed from repurposed HDPE water cans, emphasizing the design of a specialized wave tank, hydrodynamic analysis using ANSYS Fluent, and experimental validation. The wave tank's design is crucial for replicating realistic wave conditions, optimizing dimensions, wave generation mechanisms, and structural considerations for accurate testing. ANSYS Fluent, a computational fluid dynamics (CFD) software, will conduct hydrodynamic analysis to simulate the behavior of the HDPE water can-based floating platforms under various wave scenarios. This analysis will provide insights into fluid-structure interaction, wave-induced forces, and dynamic response, serving as a baseline for comparison with experimental data. The project will incorporate physical testing of sensor-equipped platforms within the wave tank to capture real-time data on stability, buoyancy, and other parameters. By comparing experimental results with computational simulations, the project aims to validate the accuracy and reliability of the numerical model developed in ANSYS Fluent, enhancing understanding and optimizing the construction of sustainable floating platforms.

Title: SHIP DETECTION USING DEEP LEARNING & SAR IMAGER

Abstract:

The features of synthetic aperture radar (SAR) has been One of the key advantages of CNNs is their ability to learn widely used in maritime surveillance. While various object detection hierarchical representations of data, automatically capturing complex techniques have been proposed, currently, the techniques for patterns and structures within images. This hierarchical feature detecting ships are inconsiderate to the small-scale vessels. Due to the complexity of images, traditional classification techniques often learning allows CNNs to adapt to the varying appearance of ships fail to classify complex images. Also, the intricacies of numerous across different photographs, even in challenging conditions such as ships, varying imaging settings,

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and limited tagged images have varying lighting, imaging orientations, and diverse ship classes. made ship categorization difficult in optical images. While the traditional classification approaches rely on feature extraction; Furthermore, CNNs excel in target segmentation tasks, making them however, they frequently fail to design well-performing features for particularly well-suited for ship categorization. By leveraging complicated images, this paper presents a method that learns architectures such as Fully Convolutional Networks (FCNs)or U-Net, discriminative features and achieves strong classification accuracy CNNs can accurately delineate ship boundaries within images, using deep networks. A novel multi-scale method that uses an R- enabling precise classification and recognition of ships even amidst CNN network has been applied to extract the features of the images. cluttered backgrounds or overlapping vessels. We studied various aspects of ship photography and present the findings in the experiments. The R-CNN-based technique works well for ship categorization, capable of learning discriminative features.

II. Publications contributing to SDG14::

At Chennai Institute of Technology (CIT), students and faculty members are encouraged to publish research aligned with Sustainable Development Goal (SDG) 14, which focuses on sustainable life under water.

III. Research and Innovation contributing to SDG14:

Develop and test new, sustainable wastewater treatment technologies with a focus on resource recovery and minimizing environmental impact.

1	Phytochemical Analysis 0f The Methanolic Extract from The Mangrove Species Avicennia Marina Plant Species Inhabited in Coastal Water
2	IoT Applications in Marine Monitoring: Protecting Ocean Health and Biodiversity
3	Fluoride Contamination of Groundwater in a Coastal Region – A Growing Environmental Pollution Threat
4	Smart Fish Feeding System for Aquaculture

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