



**DCT'S DHEMPE COLLEGE OF ARTS & SCIENCE
MIRAMAR – GOA**

DEPARTMENT OF BIOTECHNOLOGY

REPORT OF FIELD VISIT TO SEWAGE TREATMENT PLANT, TONCA

A field visit to sewage treatment plant, Tonca, Panaji was organised for the F.Y.B.Sc Biotechnology students by the Department of Biotechnology, DCT's Dhempe College of Arts and Science supported by DBT Star College Scheme on 9th October 2025. Mrs Mrunal Phadke and Mr. Kamlesh Korgaonkar, faculty of the Department of Biotechnology, accompanied the students.

As part of the academic visit, students were first introduced to the sewage collection system of Panaji city. They were briefed on how sewage from various residential and commercial areas is transported through an underground pipeline network to the treatment plant. The collection system operates through a combination of pumping stations and gravity-based flow, depending on the terrain. All incoming sewage is initially collected in a central tank and directed to the wet well, where large solid wastes such as plastics, wood, and other debris are removed using mechanical screens and conveyor-based systems supported by sensors and manual supervision.

The collected sewage is then pumped using raw sewage pumps of varying capacities to regulate flow under different load conditions. This is followed by the primary treatment stage, where finer suspended materials are removed. This stage includes screening to remove smaller plastic particles, grit removal to eliminate sand and soil, and oil and grease removal using flotation principles. The treated water from this stage is then forwarded for biological treatment.

Further treatment is carried out in Sequential Batch Reactors (SBRs), where microorganisms degrade the remaining organic matter. This process involves controlled aeration and mixing to support microbial activity, followed by sedimentation to allow sludge to settle, and decantation to collect clarified water. The entire cycle is automated and monitored to ensure effective treatment.

The treated effluent is disinfected in a chlorine contact tank to eliminate pathogenic microorganisms and is subsequently reused for gardening and landscaping purposes. The sludge generated during treatment is partially recycled as microbial inoculum, while excess sludge is processed, dewatered, sun-dried, and utilized as manure due to its nutrient-rich nature.

Throughout the treatment process, the quality of treated water is regularly monitored through parameters such as BOD, COD, and pH, and reports are submitted to the Pollution Control Board. The treated water is released only after ensuring compliance with environmental standards, thereby preventing ecological disturbance. Overall, the visit provided valuable practical exposure to large-scale sewage treatment operations and reinforced theoretical concepts related to environmental biotechnology.

Number of beneficiaries: 27

Learning outcomes:

1. Students gained practical understanding of large-scale sewage collection systems, including gravity-based flow and pumping mechanisms used in urban wastewater management.
2. The visit enabled students to comprehend the sequential stages of sewage treatment, from preliminary screening and primary treatment to biological processing using Sequential Batch Reactors (SBRs).
3. Students understood the role of microorganisms in wastewater treatment and the importance of controlled aeration, sedimentation, and decantation for effective organic matter degradation.
4. Students became familiar with water quality assessment parameters such as BOD, COD, and pH, and the importance of regulatory compliance to ensure environmental safety and ecosystem protection.



Faculty In-charge
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Mrs. Mrunal R. Phadke
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