SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY
An Autonomous Institution | Approved by AICTE | Affiliated to Anna University | Accredited by NAAC with A++ Grade
Kuniamuthur, Coimbatore – 641008
Phone : (0422)-2678001 (7 Lines) | Email : info@skcet.ac.in | Website : www.skcet.ac.in

SDG 14 – LIFE BELOW WATER



LIFE BELOW WATER

SDG 14: Life Below Water aims to conserve and sustainably use the oceans, seas, and marine resources. It focuses on reducing marine pollution, protecting marine ecosystems, and addressing the impacts of ocean acidification. The goal emphasizes the need to manage and conserve fish stocks sustainably and eliminate overfishing. It also promotes the protection of coastal and marine habitats to ensure the health of marine biodiversity. By safeguarding marine environments, SDG 14 supports the well-being of people and the planet.

POLICY

Our institute is committed to SDG 14: Life Below Water by actively promoting the conservation and protection of marine and freshwater ecosystems. We focus on reducing water pollution through community-driven clean-up initiatives and awareness programs. Our policy encourages the responsible management of waste and emphasizes the importance of preserving water bodies for sustainable use. By engaging students and local communities, we aim to foster environmental and

protect aquatic biodiversity. Through these efforts, we strive to contribute to cleaner and healthier water ecosystems for future generations.

ACTIONS PLANNED

An experimental setup of a Sustainable Smart Aquarium Monitoring and Automation System was developed and demonstrated to government school students.

OTHER SDGS INTERLINKED WITH SDG 14



The Department of Mechatronics Engineering developed a prototype on **Sustainable Smart Aquarium Monitoring & Automation System".** The experimental setup focuses on improving the routine care of aquarium fish through sensor-based monitoring, automated feeding and controlled water replacement. The setup brings together an ESP32 controller, water-quality sensors, a servo-driven feeding mechanism, relays and water pumps, with a mobile application for remote monitoring and control.

The experimental setup is presented under Sustainable Development Goal 14 (SDG 14 – Life Below Water), as it demonstrates the use of engineering and IoT-based technology to support the monitoring and responsible management of an aquatic environment.

OBJECTIVES OF THE PROJECT

- To monitor important aquarium water parameters, including pH, temperature and water level.
- To automate fish feeding through a servo-operated screw-feeding mechanism, with manual or scheduled operation.

- To facilitate water drainage and refilling using two pumps controlled through a relay arrangement.
- To process sensor information and control the connected devices using an ESP32 microcontroller.
- To enable remote monitoring and control through a mobile application, including access to a live video feed as described in the project review.

PROJECT DESCRIPTION AND WORKING PRINCIPLE

The sensors placed in the aquarium provide readings of the water conditions to the ESP32. The controller processes the incoming information and communicates with the mobile application. Based on the selected commands, the controller operates the relay module to activate the feeder or the water pumps.

The feeding unit uses a servo-driven screw mechanism. Fish pellets are placed in the feed container and are moved towards the discharge opening by the rotating screw. The water-management arrangement uses separate pumps for draining and refilling the aquarium. The prototype also incorporates an ultrasonic sensor for water-level monitoring, along with pH and temperature sensing arrangements.

The experimental setup specifies an aquarium capacity of approximately 23–25 litres. It also records a target pump flow rate of about 500 L/h and a calculated feed quantity of approximately 3–5 grams per feeding.

RELEVANCE TO SDG 14 – LIFE BELOW WATER

SDG 14 aims to conserve and sustainably use oceans, seas and marine resources. Although this experimental setup is a small-scale aquarium prototype rather than a marine-conservation intervention, it has an educational connection to SDG 14 through its focus on aquatic-environment monitoring and responsible care of aquatic life.

- **Aquatic-environment awareness:** the project demonstrates why monitoring water conditions is important for maintaining a suitable environment for fish.
- **Technology for monitoring:** sensors and the ESP32 provide a practical example of using IoT-based systems to observe water parameters.
- **Responsible care:** Automated feeding and controlled water replacement are intended to support consistent aquarium maintenance.

PROTOTYPE DEMONSTRATION

The experimental setup was presented for review, during which the team demonstrated the aquarium arrangement and its working principle to students. The prototype was also demonstrated to government school students.







