



SDG 14: Life Below Water

Overview

The University of Science and Technology – Yemen (UST) recognizes the **critical importance of marine ecosystems** to Yemen’s food security, biodiversity, and coastal livelihoods.

Aligned with **SDG 14 (Life Below Water)**, UST’s strategy focuses on **marine science research, environmental education, pollution reduction, coastal resilience, and community engagement**.

In 2024, UST expanded its partnerships with **local environmental authorities, NGOs, and fishing communities** to address the challenges of marine pollution, coastal erosion, and ecosystem degradation — issues intensified by climate change and human pressures on Yemen’s coasts. UST’s programs link **academic research, student engagement, and public initiatives** to preserve marine biodiversity and promote sustainable coastal development.

1. Learning and Student Experience

a. Marine and Environmental Education

UST integrates **marine conservation and coastal management** into the curricula of multiple faculties:

- **Faculty of Environmental Sciences and Marine Studies** offers courses in:
 - Marine ecosystems and biodiversity.
 - Coastal resource management.
 - Marine pollution control and monitoring.
 - Fisheries sustainability and blue economy.
- **Faculty of Engineering (Civil and Environmental)** teaches modules on:
 - Coastal infrastructure resilience.
 - Water quality and waste treatment systems.
 - Sustainable desalination technologies.

These programs equip students with the knowledge and skills to protect marine life and manage coastal resources responsibly.

b. Student Engagement

Students participate in field-based learning through:

- **Marine field trips** to Aden Gulf and Al-Buraiqa coast to study coral reefs and water quality.
- **Environmental clubs** organizing annual **“Coastal Cleanup Day”** campaigns.

- **Workshops and awareness seminars** on plastic pollution and marine biodiversity. In 2024, more than **600 students** engaged in marine-related educational and volunteer programs.

2. Research and Innovation

a. Research Areas and Achievements (2023–2025)

UST researchers produced **15+ scientific outputs** directly supporting marine and aquatic ecosystem protection, including:

1. *“Assessment of Microplastic Pollution in Aden’s Coastal Waters”* – UST Environmental Journal (2024).
2. *“Impact of Urban Runoff on Marine Water Quality in the Gulf of Aden”* – Faculty of Engineering Research (2024).
3. *“Coral Reef Health Monitoring Using Remote Sensing Techniques”* – UST ICT and Environmental Collaboration Project (2023).
4. *“Sustainable Aquaculture in Yemen: Challenges and Prospects”* – Business and Environmental Policy Research Group (2024).
5. *“AI-based Prediction of Algal Blooms in Coastal Areas”* – UST Computer Science Research (2025).

These studies support **marine conservation policy development, pollution control, and sustainable fishing practices.**

UST’s applied research advances understanding of marine systems, pollution reduction, and sustainable coastal management — critical to achieving SDG 14 targets.

Year	Project / Publication	SDG 14 Relevance
2024	<i>Marine Pollution Assessment in the Red Sea Coast of Yemen</i> — UST Journal of Environmental Studies	Evaluates microplastic and chemical contaminants in coastal waters.
2024	<i>Impact of Urban Wastewater on Coastal Marine Life in Aden Governorate</i> — Faculty of Environmental Science	Recommends integrated wastewater management to protect marine habitats.
2023 – 2025	<i>Sustainable Fisheries and Livelihoods for Coastal Communities in Yemen</i> — Faculty of Business and Development Studies	Promotes sustainable fishing and value-chain improvements.
2024	<i>Marine Biotechnology Applications in Yemen’s Blue Economy</i> — Faculty of Pharmacy	Explores marine organisms for pharmaceutical and biotechnological use.
2024	<i>Satellite Monitoring of Coastal Erosion and Marine Ecosystem Changes</i> — Engineering Research Group	Uses GIS and remote sensing for marine environmental monitoring.

These research efforts demonstrate UST’s interdisciplinary contribution to marine science, environmental protection, and coastal community development — central goals of SDG 14.

b. Research Collaboration

UST collaborates with:

- **Yemen’s Environment Protection Authority (EPA)** – for marine monitoring and pollution assessment.
- **Ministry of Fish Wealth and Marine Resources** – on coastal resource management research.
- **Regional Organization for the Conservation of the Red Sea and Gulf of Aden (PERSGA)** – for data sharing and marine training programs.
- **UNDP Yemen** – on community-based coastal resilience initiatives.

These partnerships ensure that UST’s research translates into practical, policy-relevant outcomes.

3. Sustainable Campus and Environmental Operations

a. Waste Management and Marine Protection

UST has implemented a comprehensive **waste management program** to prevent marine pollution:

- Full elimination of **single-use plastics** in campus cafeterias and events (since 2023).
- **Recycling stations** installed at Aden and Hodeidah campuses to reduce ocean-bound waste.
- **Awareness campaigns** under the slogan *“Our Waste, Our Responsibility”* to prevent littering and runoff pollution.

b. Water Efficiency and Pollution Prevention

- **Greywater reuse systems** installed in campus facilities to minimize wastewater discharge.
- Research on **biodegradable waste filtration** systems to treat water before release.
- Faculty-led project: *“Reducing Chemical Waste Impact from University Labs on Coastal Waters”* (2024).

c. Green Campus Design

UST’s Aden campus landscaping uses **low-water native species** and permeable surfaces, reducing runoff pollution into the sea.

4. Community Engagement and Public Awareness

a. Community Projects

UST’s Community Service Center leads multiple initiatives:

- **“Clean Coast, Safe Sea” Campaign (2024):**
 - Over **200 students and staff** joined local fishermen and NGOs in cleaning coastal areas of Al-Tawahi and Little Aden.
 - Collected **over 2 tons of plastic waste** from beaches.

- Featured on local media (Al-Ayyam, 2024).
- **Environmental Awareness Workshops for Fishermen:**
 - Conducted training on sustainable fishing, marine pollution, and waste management.
 - Delivered in collaboration with the Ministry of Fish Wealth and Aden University.
- **Educational Programs for Schools:**
 - UST students delivered **marine environment lectures** to secondary schools near Aden’s coastline, reaching over **78 students**.

b. World Oceans Day 2024 Celebration

UST marked World Oceans Day through exhibitions, expert talks, and student research presentations on:

- Marine plastic pollution.
- Coral reef degradation.
- Role of youth in protecting marine life.

This event strengthened UST’s visibility as a national leader in marine education.

5. Partnerships and Policy Engagement

UST’s efforts to advance SDG 14 are enhanced through local, national, and regional partnerships:

- **Yemen EPA** – joint water-quality monitoring.
- **UNDP and PERSGA** – technical training for students and staff on marine biodiversity.
- **Aden Port Authority** – pilot waste segregation and pollution-prevention project.
- **Local fishing cooperatives** – awareness sessions on sustainable fishing and gear management.

In 2024, UST signed **four new MoUs** with marine and environmental agencies for collaborative action.

6. Performance Indicators (2024)

Indicator	2024 Progress / Description
Marine-related research publications	15+ Increased interdisciplinary studies across faculties.
Students engaged in marine/environmental fieldwork	200+ Participation in cleanup, monitoring, and training.
Marine or coastal cleanup campaigns	6 Community and student-led programs.
Plastic reduction on campus (%)	70% Major phase-out achieved in 2024.
Partnerships with marine/environmental bodies	5 Including EPA, PERSGA, and UNDP.
Marine conservation or awareness events	10 Climate and ocean-themed events.

Indicator	2024 Progress / Description
Waste collected from cleanup drives (tons)	2.0+ Documented via UST Community Center reports.

7. Case Studies

Case Study 1 – “Clean Coast, Safe Sea” Campaign

A flagship UST community project launched in 2024 targeting marine pollution:

- Over **2 tons of waste** removed from coastal zones of Aden.
- Collaboration with local NGOs and fishermen.
- Supported by the Faculty of Environmental Sciences and student clubs.
- Resulted in local media recognition and policy engagement.

Case Study 2 – “Coral Health Monitoring via Remote Sensing”

An interdisciplinary research project between the Faculties of Engineering and IT:

- Used **drone and satellite data** to assess coral bleaching and sedimentation rates.
- Findings shared with the **Environment Protection Authority** to inform restoration projects.

Case Study 3 – “Zero Plastic Campus” Initiative

- Eliminated single-use plastics in cafeterias and administrative offices.
- Introduced water refill stations, reusable cups, and eco-packaging.
- Reduced estimated plastic waste by **70% in 2024**, preventing thousands of bottles from reaching the sea.

8. SDG Linkages

Linked SDG	Connection
SDG 6 – Clean Water and Sanitation	Pollution control and water-quality monitoring.
SDG 12 – Responsible Consumption	Plastic waste reduction and recycling.
SDG 13 – Climate Action	Coastal adaptation and resilience.
SDG 15 – Life on Land	Integrated watershed management.
SDG 17 – Partnerships for the Goals	Collaboration with EPA, PERSGA, and UNDP.

9. Future Outlook (2025 Targets)

1. Launch a **Marine Research and Sustainability Center** in collaboration with EPA and PERSGA.
2. Publish **at least 10 new marine-related studies** annually.
3. Expand the **Zero Plastic Initiative** to all branches.
4. Establish a **marine biodiversity database** for coastal Yemen.
5. Develop a **Bachelor’s minor in Marine and Coastal Studies**.
6. Host an **International Symposium on Marine Conservation and Climate Resilience (2025)**.

10. Conclusion

The University of Science and Technology – Yemen demonstrates a strong institutional commitment to **SDG 14: Life Below Water** through education, research, operational sustainability, and community partnerships.

Despite Yemen's challenging environmental context, UST continues to **lead marine conservation awareness, produce applied research, and engage youth and local communities** in practical marine protection efforts.

Its initiatives represent a **holistic and verifiable contribution** to marine sustainability and climate resilience, making UST a regional model for universities advancing **ocean-related SDGs**.