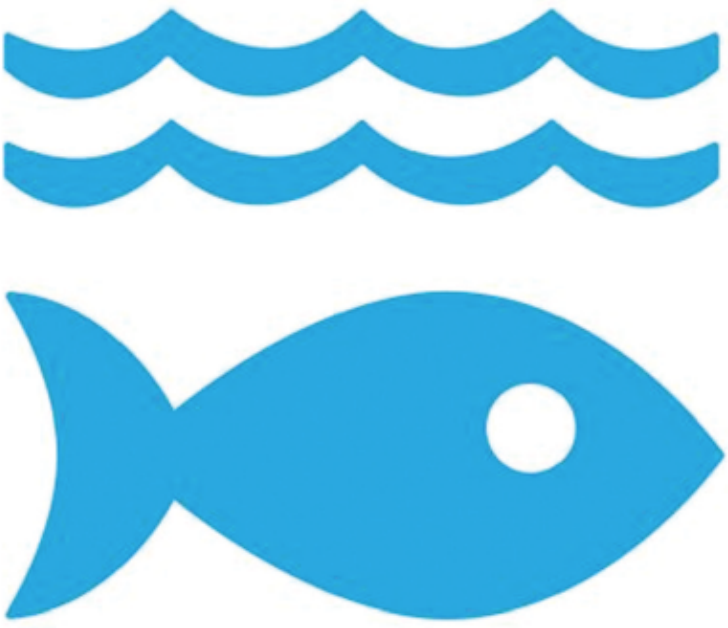
BAU BAHÇEŞEHİR UNIVERSITY

SDG 14: LIFE BELOW WATER



2024-2025

BAU AT A GLANCE

Since its foundation in 1998, the vision of BAU has been to be a global university known for its contribution to scientific, technological, and cultural knowledge through innovative education models and research approaches that reflect international standards as well as service to society. Currently, BAU Global Network comprises of 5 universities (Istanbul, Washington D.C., Berlin, Cyprus, Batumi), 5 liaison offices (BAU Global Azerbaijan Jordan, Uzbekistan, Mongolia, Pakistan) and 5 language schools.

Bahçeşehir University (BAU) is committed to advancing the wellbeing of local and global communities by integrating the United Nations Sustainable Development Goals (SDGs) into its institutional governance, operations, organisational culture, educational programmes, academic research and stakeholder partnerships. Through this integrated approach, BAU seeks to align its academic mission and institutional practices with sustainable development priorities and contribute to positive societal change.

Bringing together staff, students and alumni, BAU promotes a university community guided by ethical conduct, social responsibility and global citizenship. The University encourages its members to recognise their responsibilities towards one another, wider society and the environment, and to apply their knowledge and skills to building a more inclusive, equitable and sustainable future.

BAU IN THE TIMES HIGHER EDUCATION

BAU participates in the Times Higher Education (THE) Impact Rankings since 2019. According to the current rankings, BAU belongs to the 1000-12000 band in the World University Rankings, 59th in the Impact Rankings and the 251-300 in the Asia University Rankings 2026. Also, BAU is ranked as the top university in Türkiye.

The university continuously increases its standing in categories related to the UN Sustainable Development Goals. As of 2026, BAU holds the following standings in the THE Impact Rankings;

- 2nd in Gender Equality
- 6 th in Quality Education
- 77 th in Peace, Justice and Strong Institutions
- 89 th in Partnership for the Goals
- Ranks between 101-200 in Reducing Inequalities
- Ranks between 201-300 in Industry, Innovation and Infrastructure

The University takes the above-mentioned rankings as evaluation criteria for progress regarding its adherence and contribution to the UN Sustainable Development Goals and will continue to report its advancement in the rankings on a yearly basis.

Marine Conservation and Scientific Research at Bahçeşehir University

Bahçeşehir University approaches SDG 14: Life Below Water as a shared responsibility that connects scientific research, technological innovation, environmental stewardship, and public benefit. As pressures on marine ecosystems intensify through pollution, biodiversity loss, climate-related changes, and the degradation of coastal environments, the University recognizes the protection and sustainable use of oceans, seas, and marine resources as an essential part of its institutional mission. Through its academic expertise, research capacity, industry partnerships, and student-led innovation culture, Bahçeşehir University contributes to the development of solutions that support healthier aquatic ecosystems and more sustainable forms of interaction with marine environments.

A distinctive strength of Bahçeşehir University's contribution to SDG 14 lies in its pioneering role in underwater technologies and marine observation systems in Türkiye. The University has supported nationally significant advances that strengthen the country's capacity to monitor, understand, and protect underwater environments, including Türkiye's first domestically produced CTD Probe, developed in collaboration with STM, coordinated by BAUMIND, and supported under TÜBİTAK's Technology and Innovation Support Programs. By enabling more precise marine data collection, this system contributes to oceanographic analysis, environmental monitoring, and evidence-based ecosystem management. This commitment is further reflected in the Co-Light Underwater Lighting System, developed through the STM and BAU collaboration, which improves visibility beneath the water's surface and supports real-time underwater inspection, ecological monitoring, biodiversity assessment, and the evaluation of coastal and submerged environments. Student-led innovation also plays an important role through the BAUROV Autonomous Underwater Vehicle Team, whose latest model, G.Ü.L.L.E, supports underwater imaging, research, and environmental data collection. Through field activities in the Marmara Sea, including work related to the mucilage phenomenon, BAUROV demonstrates how science-driven engineering can contribute to pollution monitoring, water quality assessment, and the protection of marine life.

Together, these initiatives illustrate Bahçeşehir University's broader commitment to SDG 14 and to the protection of marine ecosystems through research, innovation, education, and collaboration. By investing in underwater technologies, supporting marine observation capacity, and empowering students to develop sustainability-oriented engineering solutions, the University positions itself as an active contributor to the conservation and sustainable use of aquatic environments. In doing so, Bahçeşehir University advances a model of higher education in which technological progress is aligned with ecological responsibility and the long-term well-being of life below water.

Turkey's First Domestic Marine Observation Instrument Developed by BAU



Bahçeşehir University, in collaboration with Defense Technologies Engineering and Trade Inc. (STM), has achieved a significant milestone in marine technology and oceanographic research through the development of Türkiye's first domestically produced CTD Probe (Conductivity, Temperature, Depth) system. Coordinated by BAU Innovation and Consultancy Inc. (BAUMIND) and supported under TÜBİTAK's Technology and Innovation Support Programs, the project strengthens national technological capacity in marine observation, oceanographic data collection, and environmental monitoring.

The domestically developed CTD Probe measures seawater conductivity, temperature, and depth, providing essential oceanographic data for understanding marine conditions, salinity distribution, water-column characteristics, and underwater environmental dynamics. These measurements are fundamental to scientific investigations of marine ecosystems, as changes in temperature and salinity influence ocean circulation, habitat conditions, and the distribution of marine organisms.

The initiative makes a particularly strong contribution to SDG 14 (Life Below Water), especially Target 14.a, which calls for increasing scientific knowledge, developing research capacity, and transferring marine technology to improve ocean health and enhance the contribution of marine biodiversity to sustainable development. By developing an advanced oceanographic measurement instrument through domestic research and engineering capabilities, Bahçeşehir University and its partners contribute to the technological infrastructure required for marine scientific research and evidence-based ocean management.

The CTD Probe also supports the broader objectives of SDG 14.2 (Protect and Restore Ecosystems) by providing environmental measurements that can inform the assessment and monitoring of marine ecosystem conditions. Reliable data on seawater temperature, conductivity, and depth can help researchers investigate environmental changes, identify variations in oceanographic conditions, and better understand the physical processes influencing marine habitats. Such scientific information is important for developing informed approaches to marine conservation, ecosystem management, and the sustainable use of ocean resources.

Beyond its scientific and technological contributions, the project demonstrates the importance of university–industry collaboration in advancing marine research infrastructure. By combining Bahçeşehir University's academic expertise with STM's engineering capabilities and TÜBİTAK's research and innovation support, the initiative also contributes to SDG 9 (Industry, Innovation and Infrastructure) and SDG 17 (Partnerships for the Goals).

Through the development of locally engineered marine observation technology, Bahçeşehir University reinforces its contribution to SDG 14 by expanding marine scientific knowledge, strengthening oceanographic research capacity, and supporting the data-driven understanding and sustainable management of marine ecosystems.

Bahçeşehir University's Innovations in Underwater Technologies, Marine Monitoring and Aquatic Ecosystem Protection

Bahçeşehir University advances marine science, underwater engineering, and environmental monitoring through a portfolio of patented technologies addressing underwater illumination, optical communication, water-quality analysis, and intelligent drainage management. Developed through university research and, in the case of the Co-Light Underwater Lighting System, collaboration with Technologies Engineering and Trading Inc. (STM), these innovations strengthen technological capabilities relevant to the observation, investigation, and sustainable management of aquatic environments.

The university's contributions are particularly relevant to Sustainable Development Goal 14 (Life Below Water), especially Target 14.a, which promotes marine scientific knowledge, research capacity, and marine technology, as well as Target 14.2, concerning the sustainable management and protection of marine and coastal ecosystems, and Target 14.1, addressing marine pollution from land-based activities.

1. Co-Light Underwater Lighting System – Underwater Lighting Apparatus







Patent Information

• Patent Title: Underwater Lighting Apparatus

• Application Number: 2017/01456

• Application Date: January 31, 2017

• Patent Registration Date: March 21, 2024

• Status: Registered Patent

Developed through collaboration between Bahçeşehir University and STM, the Co-Light Underwater Lighting System introduces an intelligent, multi-spectrum LED illumination technology designed to improve underwater visibility, imaging quality, and observation capabilities.

The system incorporates five independent LED arrays emitting red, green, blue, white, and ultraviolet (UV) light, each paired with a photodiode sensor that measures the absorption of its corresponding wavelength in water. By continuously evaluating optical density and turbidity, the system automatically adjusts the intensity and distribution of individual wavelengths to produce balanced illumination under changing underwater conditions.

Unlike conventional halogen or single-spectrum LED systems, Co-Light dynamically adapts its spectral composition to compensate for the selective absorption of light underwater. Its analog driver circuits enable smooth illumination transitions, minimize shadows and glare, and improve colour representation in underwater imaging.

The technology also incorporates a waterproof, pressure-resistant sealed housing suitable for demanding underwater environments. Its selective activation of required wavelengths supports energy-efficient operation, while compatibility with underwater cameras enables high-resolution imaging. Potential applications include deep-sea exploration, autonomous underwater vehicles, inspection of submerged infrastructure, underwater archaeology, and marine scientific observation.

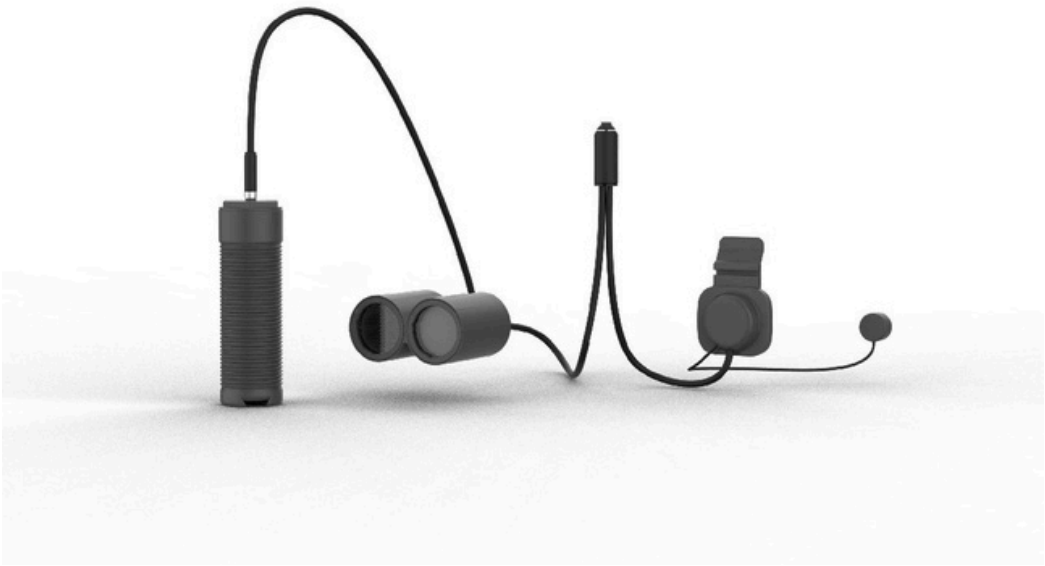
The system also offers opportunities for inspecting submerged structures without extensive dry-docking or disruptive intervention, potentially reducing the operational disturbance associated with certain conventional inspection activities.

The Co-Light system makes a particularly relevant contribution to SDG Target 14.a by advancing marine observation and imaging technology. Accurate underwater visual documentation is important for studying marine habitats, identifying changes in underwater conditions, and supporting scientific investigations of aquatic ecosystems.

The technology is also relevant to SDG Target 14.2, as improved underwater imaging can support the observation of marine habitats, the documentation of ecosystem conditions, and the assessment of submerged environments. Its adaptive illumination capabilities may facilitate more reliable visual information in environments where turbidity, depth, and variable light absorption make conventional observation difficult.

By improving the quality of underwater imaging while using energy-efficient illumination, the invention strengthens the technological foundations for marine research and environmental monitoring. It also supports SDG 7 (Affordable and Clean Energy) through efficient LED operation and SDG 9 (Industry, Innovation and Infrastructure) through advanced optical engineering.

2. An Underwater Communication Device – Optical Communication Between Divers



Patent Information

• Patent Title: An Underwater Communication Device

• Application Number: 2018/10865

• Application Date: July 27, 2018

• Utility Model Registration Date: January 22, 2024

• Status: Registered Utility Model

This invention introduces an optical underwater communication device designed to enable real-time, wireless, bidirectional voice communication between divers without relying on conventional communication cables, face-mask-mounted microphones, or acoustic transmission systems.

The system uses a throat microphone that captures vibrations from the user's larynx and converts them into electrical signals. A control unit modulates these signals into optical waves transmitted through an underwater light emitter. At the receiving end, a photodetector captures the optical signal, while a demodulation unit and earphone reconstruct the transmitted voice.

The technology allows divers to act as both transmitters and receivers, enabling two-way communication during underwater activities.

Its technical architecture includes a vibration sensor, modulated control unit, directional light emitter with guiding walls to minimise scattering, photodetector receiver, demodulator, and speaker system. The optical unit can use laser or multi-LED light sources to improve transmission fidelity.

The design seeks to provide low-latency communication, reduced electromagnetic interference, and improved speech clarity in noisy underwater environments. Its ergonomic configuration also reduces dependence on bulky communication equipment.

Potential applications include underwater scientific expeditions, diver-assisted environmental monitoring, marine infrastructure inspection, underwater rescue operations, and coordinated research activities.

The invention supports SDG Target 14.a by developing communication technology relevant to the operational capabilities of marine researchers and underwater scientific teams.

Effective communication is essential when divers conduct habitat observations, collect environmental samples, inspect submerged research equipment, or document underwater conditions. By enabling direct communication between divers, the device could improve coordination, information exchange, and operational safety during marine fieldwork.

The technology is also relevant to SDG Target 14.2, as communication capabilities can support organised underwater surveys, marine habitat assessments, and coordinated conservation-related activities.

Optical communication offers an alternative to acoustic systems in suitable operating conditions. However, any reduction in underwater noise impacts would require specific environmental testing and should not be assumed solely from the device's design.

The invention additionally supports SDG 9 (Industry, Innovation and Infrastructure) through optical communication innovation and SDG 16 (Peace, Justice and Strong Institutions) through potential applications in underwater safety, security, and rescue coordination.

3. Communication Device for Underwater Platforms – Optical Data Networks



Patent Information

• Patent Title: Communication Device for Underwater Platforms

• Application Number: 2019/20881

• Application Date: December 20, 2019

• Patent Registration Date: February 21, 2024

• Status: Registered Patent

This invention develops a wireless, bidirectional optical communication system for transmitting digital information between underwater platforms, including submarines, autonomous underwater vehicles (AUVs), seabed stations, and fixed marine infrastructure.

The device incorporates a data input unit, control module, optical transmission unit, and photodetector-based receiver. Digital information is converted into modulated optical signals and reconstructed by the receiving unit.

Its components are integrated into a cylindrical, pressure-resistant, waterproof housing designed to support optical communication across a 360-degree field, allowing data exchange between moving and stationary platforms without requiring continuous active alignment.

The system uses LED or laser-based emitters, multi-photodetector arrays, and a microprocessor-controlled communication board to support high-bandwidth data transmission.

Its modular plug-and-connect architecture facilitates integration with different underwater platforms and fixed observation nodes. Energy-efficient LED-based transmission also supports applications requiring sustained underwater operation.

Compared with conventional wired communication systems, the technology offers greater deployment flexibility. Within suitable optical line-of-sight conditions, it also provides an alternative to acoustic communication for transmitting information between underwater devices.

The invention contributes strongly to SDG Target 14.a by advancing the communication infrastructure needed for marine scientific research and underwater observation networks.

Marine research increasingly depends on autonomous vehicles, underwater instruments, and fixed monitoring stations capable of collecting environmental information. Reliable communication between these systems is important for transferring observations, coordinating research activities, and supporting the interpretation of underwater conditions.

The technology is also relevant to SDG Target 14.2, as interconnected underwater platforms could support ecosystem monitoring, marine habitat observation, and scientific assessments of environmental change.

By enabling information exchange between underwater instruments and platforms, the invention provides a technological foundation for more integrated marine observation systems. Such systems can assist researchers in examining environmental conditions across different locations and depths, supporting evidence-based approaches to the sustainable management of marine ecosystems.

The project additionally supports SDG 9 (Industry, Innovation and Infrastructure) through underwater networking innovation and has broader relevance to SDG 13 (Climate Action) through potential applications in long-term environmental observation.

4. Digital Optical Communication Device Between Underwater and Surface Platforms





Patent Information

• Patent Title: Digital Optical Communication Device Between Underwater and Surface Platforms

• Application Number: 2023/017317

• Application Date: December 14, 2023

• Patent Registration Date: June 23, 2025

• Status: Registered Patent

This invention introduces a digital optical communication system enabling high-speed, low-power data transmission between underwater and surface platforms.

The device establishes communication between an underwater fin communication unit and a surface-based control communication unit, using LED emitters, optical filters, and an IP-based digital communication architecture.

The system supports both audio and video transmission, allowing information collected underwater to be communicated to surface operators in real time.

A central technological feature is the use of blue and green LED wavelengths, which experience comparatively low absorption in water. This design improves optical transmission efficiency and helps reduce signal attenuation.

The system achieves a reported data transmission rate of approximately 2 Mbit/s and supports stable communication over distances of up to 25 metres under the stated operating conditions.

Additional technical features include LED emitters with a 120-degree emission angle, 7-degree reflectors designed to limit light scattering, and an aluminium and plexiglass enclosure providing waterproof protection and optical transmission performance.

Its modular design allows potential integration into civilian and research applications, including underwater archaeology, environmental monitoring, underwater exploration, and marine infrastructure inspection, as well as defence and security operations.

This invention has a particularly strong connection to SDG Target 14.a, as it addresses a fundamental challenge in marine research: transferring information efficiently between submerged instruments and surface-based monitoring systems.

The ability to transmit underwater audio and video information in real time can support marine scientists in observing submerged environments, monitoring research equipment, and coordinating scientific investigations.

The technology is also relevant to SDG Target 14.2, as improved connectivity between underwater and surface platforms can facilitate marine ecosystem observation and support the collection and communication of information relevant to habitat assessment and conservation planning.

By strengthening the connection between underwater observation systems and surface-based researchers, the invention supports the development of more responsive marine scientific infrastructure.

Its energy-efficient optical transmission architecture further contributes to SDG 9 (Industry, Innovation and Infrastructure), while its potential use in environmental monitoring provides complementary relevance to SDG 13 (Climate Action).

5. An Underwater Analysis Device for Measuring the Light Absorption Capacity of Water

Patent Information

• Patent Title: An Underwater Analysis Device for Measuring the Light Absorption Capacity of Water

• Application Number: 2017/11450

• Application Date: August 3, 2017

• Patent Registration Date: August 23, 2021

• Status: Registered Patent

This invention develops an underwater analytical device capable of measuring the optical absorption characteristics of water directly within aquatic environments.

The system uses a light-emitting unit, a light-detecting unit, and a processing module to evaluate changes in light transmission and absorption through a controlled water chamber.

Operating across a spectral range of 200–1100 nanometres, the technology covers ultraviolet, visible, and near-infrared wavelengths, enabling optical analysis of different water characteristics.

Unlike conventional approaches that depend primarily on retrieving water samples for laboratory analysis, the invention is designed for in situ, continuous, and real-time measurements, with a stated operating capability at depths of up to 5,000 metres.

The device incorporates two sealed compartments: one housing the light source and illumination window, and the other containing the photodiode sensors, detection window, and processor. A cylindrical chamber between these compartments allows water to enter through multiple inlet openings, enabling controlled optical measurements.

The light source transmits a test beam through the water sample chamber, while opposing sensors measure light absorption and forward the resulting information to a processing unit and user interface.

Its design provides a basis for investigating water characteristics associated with hydrocarbon dispersion, algal density, plankton concentration, suspended sediments, methane, and salinity. Interpretation of individual chemical or biological parameters depends on appropriate calibration and analytical methods.

The waterproof and pressure-resistant architecture makes the device relevant to marine observation, deep-water investigation, and environmental monitoring.

This invention represents one of the most direct contributions in the portfolio to SDG 14, particularly Targets 14.1, 14.2, and 14.a.

Under Target 14.1, the device offers measurement capabilities relevant to identifying and investigating changes in water conditions associated with pollution. Optical absorption measurements can provide information useful for monitoring suspended materials, algal conditions, and potential contamination-related changes in aquatic environments.

The technology is also relevant to Target 14.2, which promotes the protection and sustainable management of marine and coastal ecosystems. Reliable environmental measurements help researchers understand the conditions affecting aquatic habitats, investigate changes in water quality, and support scientific assessments of ecosystem health.

Its capacity for direct underwater measurements is particularly valuable because environmental conditions can vary significantly with depth, location, and time. In situ observation can therefore provide information that complements laboratory-based sampling and supports a more detailed understanding of marine environments.

Under Target 14.a, the invention advances marine scientific knowledge and technological capacity by developing an instrument designed for high-precision underwater optical analysis.

By enabling researchers to obtain and interpret environmental information directly within aquatic systems, the invention contributes to the scientific infrastructure required for marine conservation, pollution monitoring, and evidence-based ecosystem management.

The technology also supports SDG 6 (Clean Water and Sanitation) through its relevance to water-quality assessment and SDG 9 (Industry, Innovation and Infrastructure) through advanced environmental sensing innovation.

6. Smart Drainage System – Preventing Land-Based Waste from Reaching Aquatic Environments

Patent Information

• Patent Title: Smart Drainage System

• Application Number: 2024/011544

• Application Date: September 2, 2024

• Patent Status: Under Examination Report

The Smart Drainage System introduces an intelligent infrastructure solution designed to manage accumulated waste, reduce drainage blockages, monitor water levels, and generate renewable energy.

The system integrates ultrasonic water-level sensors, weight sensors, a vacuum-based waste collection mechanism, a Pelton turbine for hydroelectric generation, and a solar-assisted energy management module.

Ultrasonic sensors continuously monitor water levels and identify conditions associated with potential blockages or flooding. When accumulated debris is detected, the vacuum-based collection mechanism is designed to remove waste and sediments from the drainage channel.

A weight-sensing collection tank monitors accumulated material and triggers an automated notification to the waste management centre when its capacity threshold is reached.

The system also incorporates automatic discharge and emergency piping, a centralised monitoring display, and remote monitoring capabilities.

Its hybrid renewable energy configuration combines hydropower generated through a Pelton turbine with solar-assisted energy supply and battery backup, supporting autonomous operation and reducing dependence on external power sources.

The design aims to improve drainage efficiency, reduce manual maintenance requirements, and strengthen urban flood-management infrastructure.

The Smart Drainage System establishes a particularly clear connection to SDG Target 14.1, which specifically addresses marine pollution originating from land-based activities.

Urban drainage networks can transport solid waste, sediments, and pollutants from streets and built environments into rivers, estuaries, coastal waters, and eventually marine ecosystems.

By incorporating automated debris removal and waste collection into drainage infrastructure, the proposed system addresses a potential pathway through which land-based waste can reach aquatic environments.

Its waste interception mechanism could help reduce the movement of larger debris and accumulated materials through drainage networks, while water-level monitoring and automated maintenance alerts may support more effective management of drainage infrastructure.

The technology is also relevant to SDG Target 14.2, as preventing waste from entering connected waterways can contribute to broader efforts to protect aquatic habitats and reduce environmental pressures on coastal ecosystems.

Importantly, the system addresses pollution prevention before waste reaches receiving water bodies, reflecting the source-control approach central to sustainable marine protection.

Although the environmental performance of the system would require field validation, its integrated design provides a technological approach relevant to reducing land-based waste pathways into aquatic ecosystems.

The invention additionally contributes to SDG 6 (Clean Water and Sanitation) through improved drainage and water management, SDG 7 (Affordable and Clean Energy) through renewable energy integration, and SDG 11 (Sustainable Cities and Communities) through resilient urban infrastructure.

Taken together, Bahçeşehir University's underwater technology and environmental engineering innovations demonstrate a multidimensional contribution to SDG 14 (Life Below Water).

The portfolio addresses three complementary dimensions of marine sustainability.

SDG 14.a — Increasing Scientific Knowledge and Developing Marine Technology: The underwater illumination, diver communication, underwater platform networking, surface-to-underwater digital communication, and water-analysis inventions strengthen technological capabilities relevant to marine scientific investigation. Collectively, they address practical challenges associated with observing, measuring, communicating, and analysing information in underwater environments.

SDG 14.2 — Protecting and Sustainably Managing Marine and Coastal Ecosystems: Advanced underwater imaging, communication, and environmental measurement technologies provide tools that can support habitat observation, ecosystem assessment, and scientific monitoring. These capabilities are relevant to understanding environmental changes and informing the sustainable management of marine resources.

SDG 14.1 — Preventing and Reducing Marine Pollution: The underwater water-analysis device provides a basis for monitoring environmental conditions associated with water quality and pollution, while the Smart Drainage System proposes a preventive approach to intercepting land-based waste before it reaches connected aquatic environments. Together, these technologies address both environmental observation and potential pollution prevention.

Beyond SDG 14, the innovations contribute to SDG 9 (Industry, Innovation and Infrastructure) through patented engineering solutions, SDG 6 (Clean Water and Sanitation) through water monitoring and drainage management, and SDG 17 (Partnerships for the Goals) through the university–industry collaboration underpinning the Co-Light initiative.

Through this portfolio, Bahçeşehir University demonstrates how scientific research, patented engineering solutions, and interdisciplinary technological innovation can strengthen the foundations of marine ecosystem protection. By developing tools for underwater observation, environmental measurement, communication, and waste interception, the university contributes to the research capacity and technological infrastructure needed to understand, monitor, and sustainably manage aquatic and marine environments.

Bahçeşehir University Underwater Cleanup Initiative: Protecting Marine Ecosystems and Combating Marine Pollution in the Bosphorus

During the 2024–2025 academic year, Bahçeşehir University, in collaboration with CIFAL Istanbul (UNITAR) and the Bahçeşehir University Underwater Club (BUSAK), organised an underwater cleanup and marine waste collection initiative in the Istanbul Bosphorus. The activity brought together university students and participants committed to marine conservation, focusing on removing accumulated waste from underwater environments and raising awareness of the environmental pressures threatening marine ecosystems.

The initiative combined direct environmental action, student volunteerism, institutional cooperation, and university-developed marine technology, demonstrating how higher education institutions can contribute to marine conservation through practical environmental activities.

The underwater cleanup involved diving operations aimed at collecting waste from the seabed and removing discarded materials from the marine environment. Such activities address an important environmental challenge affecting coastal waters and heavily used maritime areas: the accumulation of solid waste beneath the water's surface.

Marine litter can threaten aquatic organisms through entanglement, ingestion, and habitat disturbance. Waste accumulating on the seabed can also affect underwater habitats and contribute to the long-term degradation of marine environments.

By engaging in underwater waste collection, the initiative provided a practical example of marine pollution prevention and environmental stewardship, connecting sustainability awareness with direct action to remove waste from aquatic environments.

The participation of BUSAK students demonstrated the role of university student communities in marine conservation activities. Through involvement in underwater cleanup operations, students connected their diving skills and environmental awareness with practical contributions to protecting marine environments.

A particularly distinctive feature of the initiative was the use of an underwater lighting device developed by Bahçeşehir University during the cleanup operations.

Underwater visibility is an important consideration in diving activities, particularly when identifying submerged objects, inspecting underwater surfaces, and carrying out operations in environments where natural light and water clarity may be limited.

The application of university-developed underwater illumination technology demonstrated how engineering innovation can support practical marine operations, including underwater observation and waste collection.

This technological dimension reinforced the connection between Bahçeşehir University's research and development capabilities and their applications in marine environmental protection.

By bringing together underwater engineering, student participation, and practical conservation activities, the initiative illustrated how scientific and technological expertise can be mobilised beyond laboratory settings to support environmental action.

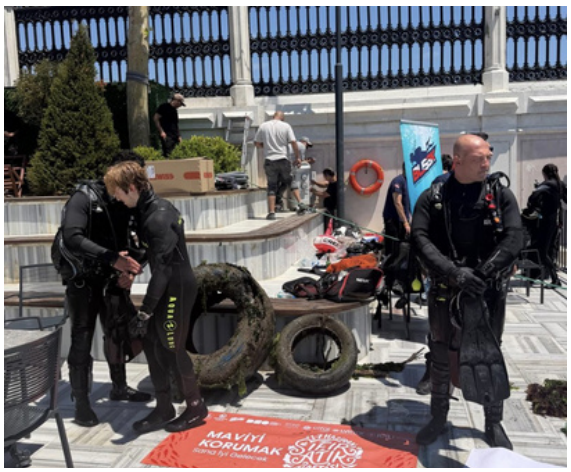
The initiative makes a direct contribution to SDG 14 (Life Below Water), particularly Target 14.1, which calls for preventing and significantly reducing marine pollution of all kinds, especially pollution from land-based activities, including marine debris.

Unlike initiatives focused exclusively on awareness-raising, the underwater cleanup involved the physical collection and removal of waste from the marine environment. This direct intervention is particularly relevant to SDG 14.1 because it addresses existing marine litter and supports efforts to reduce discarded materials in aquatic habitats.

The activity also aligns with SDG Target 14.2 (Protect and Restore Ecosystems) by contributing to the protection of underwater environments from waste-related pressures. Removing debris from marine habitats can help reduce certain risks to aquatic organisms and supports broader efforts to maintain healthier coastal and marine ecosystems.

A further contribution relates to SDG Target 14.a (Increase Scientific Knowledge and Develop Marine Technology) through the practical use of Bahçeşehir University-developed underwater illumination technology. Its application during the cleanup demonstrated the relevance of university engineering capabilities to underwater environmental operations and marine observation.

The initiative therefore addressed three complementary dimensions of SDG 14: marine litter removal, the protection of underwater environments, and the application of marine technology to environmental activities.





BUSAK Conference 5: Understanding Changes in Marine Ecosystems, Fisheries and Underwater Environments



During the 2024–2025 academic year, the Bahçeşehir University Underwater Club (BUSAK) organised BUSAK Mavisi 5, an event dedicated to exploring environmental changes affecting Türkiye's seas, underwater ecosystems, marine biodiversity, and traditional maritime activities. Bringing together individuals with extensive experience of underwater environments and maritime life, the initiative provided a platform for sharing observations and perspectives on the changing conditions of the Sea of Marmara, the Aegean Sea, the Mediterranean Sea, and the Princes' Islands.

The event approached marine environmental change from multiple perspectives, connecting underwater observation, traditional sponge diving, regional marine conditions, and fishing practices. By examining these interconnected subjects, BUSAK Mavisi 5 encouraged participants to consider the ecological, social, and economic dimensions of changes affecting marine environments and the importance of protecting underwater ecosystems for future generations.

Exploring Marine Environmental Change Through Four Perspectives

Aksona Mehmet – Changes in Sponge Diving

The session focused on changes in sponge diving; a traditional maritime activity closely associated with underwater environments and the use of marine biological resources. The topic provided an opportunity to consider the relationship between traditional marine livelihoods, underwater ecosystems, and the long-term sustainability of activities dependent on marine resources.

From an SDG 14 perspective, the discussion is particularly relevant to the importance of protecting marine biodiversity, maintaining healthy underwater habitats, and ensuring the sustainable use of marine biological resources. Traditional maritime knowledge also offers a valuable perspective for understanding how human activities and marine environments are connected.

Cem Dalyan – Changes in the Sea of Marmara

This session addressed environmental changes in the Sea of Marmara, drawing attention to a marine environment of particular ecological and geographical importance to Istanbul and the surrounding region.

The subject is directly relevant to discussions concerning marine ecosystem health, biodiversity conservation, water quality, and the environmental pressures affecting enclosed and semi-enclosed seas. Understanding changes in the Marmara Sea is important for raising awareness of the need for continuous marine observation, pollution prevention, and sustainable ecosystem management.

The session's thematic focus aligns with SDG 14.1, concerning marine pollution, and SDG 14.2, which promotes the sustainable management and protection of marine and coastal ecosystems.

Murat Draman – Changes in the Aegean and Mediterranean Seas

The session explored changes affecting underwater environments in the Aegean and Mediterranean Seas, broadening the event's geographical perspective beyond the Marmara region.

The topic highlighted the importance of understanding marine environments across different geographical areas and recognising the ecological connections between regional seas, underwater habitats, and marine biodiversity.

From a sustainability perspective, the discussion reinforced the relevance of marine ecosystem monitoring, biodiversity conservation, and long-term environmental stewardship. These themes are closely associated with SDG 14.2, particularly the need to protect marine ecosystems and strengthen their resilience.

Serço Ekşiyan – Changes in the Princes' Islands and Fishing

This session examined changes associated with the Princes' Islands and fishing activities, connecting marine environmental conditions with the use of living marine resources.

Fishing represents an important relationship between coastal communities, marine ecosystems, and economic livelihoods. Examining changes in fishing-related activities creates opportunities to discuss the importance of healthy fish populations, responsible resource use, and the sustainability of marine-based livelihoods.

The session is particularly relevant to SDG 14.4, which addresses sustainable fishing and the conservation of fish stocks, as well as the broader objective of protecting marine biodiversity and maintaining productive marine ecosystems.

BUSAK Mavisi 5 contributes to SDG 14 (Life Below Water) by promoting public and university-community awareness of changes affecting marine ecosystems, underwater habitats, and marine resource use. Through four complementary sessions, the event connected the experiences of individuals familiar with marine environments to broader discussions about the protection and sustainable use of the seas.

The initiative is particularly relevant to SDG Target 14.2 (Protect and Restore Ecosystems) through its emphasis on understanding changes in the Marmara, Aegean, and Mediterranean marine environments and the importance of maintaining healthy underwater ecosystems. By bringing regional environmental changes into a shared discussion, the event supported awareness of marine ecosystem vulnerability and the need for long-term conservation.

The programme also aligns with SDG Target 14.4 (Sustainable Fishing) through its examination of fishing-related changes around the Princes' Islands and the importance of sustaining marine biological resources. Its focus on sponge diving further highlighted the relationship between traditional maritime activities and the ecological conditions that support marine-based livelihoods.

In addition, the event has relevance to SDG Target 14.1 (Reduce Marine Pollution) by providing a forum for considering environmental changes in regional seas and the broader importance of preventing pressures that threaten marine ecosystem health.

Beyond SDG 14, the initiative supports SDG 4 (Quality Education) by extending environmental learning beyond formal academic instruction and encouraging knowledge exchange between experienced maritime practitioners and the university community. It also contributes to SDG 13 (Climate Action) by fostering awareness of marine environmental change and the importance of resilient aquatic ecosystems.

Through BUSAK Mavisi 5, Bahçeşehir University demonstrated the contribution of student-led initiatives to marine environmental education and awareness, creating opportunities for participants to engage with different perspectives on the changing conditions of Türkiye's seas. By bringing together discussions of underwater environments, traditional maritime practices, regional ecological change, and fisheries, the event reinforced the importance of informed public engagement and collective responsibility in protecting life below water.





BAUROV Team's Creative Underwater Robot: G.Ü.L.L.E



Founded by students of Bahçeşehir University, BAUROV (Bahçeşehir Autonomous Underwater Vehicle Team) develops innovative underwater robotic systems designed to advance marine research, environmental observation, and technological solutions relevant to ocean sustainability. Combining engineering expertise, autonomous systems, and environmental responsibility, the team demonstrates how student-led technological innovation can contribute to understanding and protecting aquatic ecosystems. Its activities are closely aligned with the United Nations Sustainable Development Goals, particularly SDG 14 (Life Below Water), through their focus on underwater exploration, marine environmental monitoring, and the sustainable management of ocean resources.

A significant achievement of the team is the development of G.Ü.L.L.E, its most compact and efficient autonomous underwater vehicle to date. Weighing 7.1 kilograms, featuring a 30.2-centimetre frame, and equipped with eight motors, the vehicle combines a compact engineering design with underwater mobility and operational capabilities. The system has been successfully tested at depths of up to 80 metres, demonstrating the team's capacity to develop and test robotic technologies for underwater operations.

Beyond vehicle development, BAUROV has undertaken underwater research and observation activities in the Sea of Marmara, where the team conducted underwater imaging and data collection to investigate environmental conditions associated with the mucilage phenomenon, a major ecological concern affecting marine ecosystems in the region. Marine mucilage can interfere with underwater ecological processes, affect marine habitats, and place additional pressure on aquatic organisms, making the observation and understanding of its environmental dynamics particularly important.

Through these field activities, BAUROV connects technological development with practical marine environmental research. Underwater imaging enables the documentation of submerged conditions, while sensor-based systems designed for pollutant detection and water-quality monitoring offer opportunities to gather environmental information relevant to marine ecosystem assessment. By integrating robotic mobility, underwater observation, and environmental sensing, the initiative supports the development of technological approaches that can strengthen marine monitoring and inform future environmental research.

BAUROV makes a particularly strong contribution to SDG 14 (Life Below Water), especially Target 14.a, which calls for increasing scientific knowledge, developing research capacity, and advancing marine technology to improve ocean health. The development of the G.Ü.L.L.E underwater vehicle demonstrates Bahçeşehir University's student-led capacity to design, construct, and test advanced underwater research technologies. By combining robotics, engineering, and environmental observation, the team contributes to the technological capabilities needed to investigate marine conditions and support scientific understanding of underwater environments.

The initiative also directly aligns with SDG Target 14.2 (Protect and Restore Ecosystems) through its underwater observation activities in the Sea of Marmara. By collecting images and environmental information related to the mucilage phenomenon, BAUROV supports efforts to better understand ecological pressures affecting marine habitats. Such observations are relevant to the assessment of ecosystem conditions, the identification of environmental changes, and the development of informed approaches to marine ecosystem protection and sustainable management.

A further connection exists with SDG Target 14.1 (Reduce Marine Pollution), particularly through the team's work on environmental sensing, pollutant detection, and water-quality monitoring. Marine pollution and nutrient enrichment are important environmental pressures associated with deteriorating water quality and conditions that can contribute to mucilage formation. Technologies capable of observing underwater environments and collecting water-quality information can support the identification and investigation of pollution-related changes, contributing to the scientific evidence needed for marine pollution monitoring and prevention strategies.

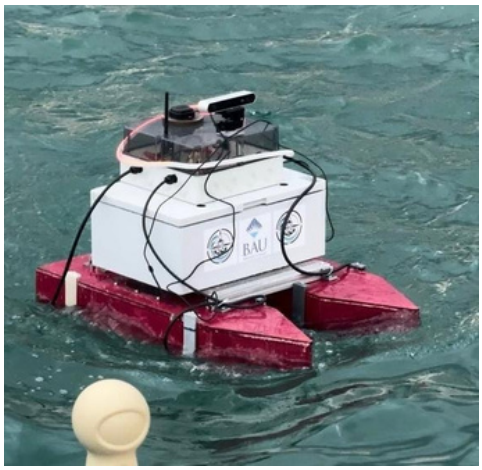
The significance of BAUROV's work lies in its integration of marine research, environmental monitoring, and technological innovation. Rather than approaching ocean sustainability solely as an educational or awareness-raising issue, the team develops engineering systems with practical applications in underwater observation and environmental investigation. Its research activities in the Sea of Marmara demonstrate how university students can participate in addressing regional marine environmental challenges through scientific inquiry and technological development.

The initiative additionally supports SDG 9 (Industry, Innovation and Infrastructure) through autonomous underwater robotics and sensor-based engineering, SDG 4 (Quality Education) by providing students with applied, interdisciplinary research and engineering experience, and SDG 13 (Climate Action) through the broader relevance of marine environmental observation to understanding changing aquatic conditions.

Through BAUROV, Bahçeşehir University contributes to the development of the next generation of marine research technologies while engaging students directly in the investigation of environmental challenges affecting Türkiye's seas. The combination of an operational underwater robotic platform, field-based imaging and data collection, and environmental sensing capabilities provides a concrete example of how student-led scientific innovation can support marine ecosystem monitoring, pollution-related research, and the long-term objectives of SDG 14: Life Below Water.

Navi İDA's Innovative Approaches to Autonomous Marine Systems





Established in 2024 by students of Bahçeşehir University, Navi İDA is a student-led research and development team dedicated to advancing autonomous marine technologies through artificial intelligence, computer vision, and innovative engineering solutions. Comprising 11 students from the Faculty of Engineering and Natural Sciences, the team develops unmanned marine vehicle technologies with potential applications in maritime operations, scientific observation, environmental monitoring, and the sustainable management of marine resources.

The team's technological achievements have received national recognition through the "Most Original Software" award at the TEKNOFEST Unmanned Marine Vehicle Competition. This distinction highlights Navi İDA's innovative approach to software development and autonomous navigation, demonstrating the capacity of Bahçeşehir University students to design sophisticated technological solutions for marine environments.

At the centre of Navi İDA's work is the integration of artificial intelligence, autonomous control systems, and computer vision technologies into unmanned marine vehicles. These technologies are designed to enable autonomous navigation, environmental observation, and the collection of information from marine environments. By combining intelligent software with maritime engineering, the team contributes to the development of technological platforms that can support scientific investigations and improve the efficiency of marine observation activities.

Autonomous marine vehicles offer important opportunities for environmental research, particularly in areas where repeated observation, systematic data collection, and precise navigation are required. Technologies such as those developed by Navi İDA can provide a foundation for monitoring water conditions, identifying visible environmental changes, and supporting future applications in pollution detection and marine ecosystem assessment.

The initiative also reflects the importance of interdisciplinary education in addressing environmental challenges. Through the design, programming, testing, and development of autonomous marine systems, students gain practical experience in engineering innovation while exploring how emerging technologies can contribute to the protection and sustainable use of marine resources.

Navi İDA makes a particularly strong contribution to SDG 14 (Life Below Water), especially Target 14.a, which promotes the development of marine scientific knowledge, research capacity, and marine technology. By developing artificial intelligence-based autonomous marine systems, the team strengthens the technological capabilities relevant to marine observation, scientific exploration, and environmental data collection.

The integration of computer vision and autonomous navigation is particularly relevant to the advancement of marine research technologies. These capabilities can enable unmanned systems to observe aquatic environments, navigate marine areas, and support the collection of information needed to understand changing environmental conditions. Such technological development contributes to the research infrastructure and scientific capacity required for evidence-based marine management.

The initiative also supports the objectives of SDG Target 14.2 (Protect and Restore Ecosystems) through the potential application of autonomous marine vehicles in ecosystem observation and environmental monitoring. Marine ecosystems require continuous scientific attention to understand changes in habitat conditions, biodiversity, and environmental pressures. Autonomous systems capable of conducting systematic observations can support researchers in gathering information relevant to marine ecosystem assessment and conservation planning.

A further connection exists with SDG Target 14.1 (Reduce Marine Pollution) through the potential application of artificial intelligence and computer vision technologies in identifying pollution-related changes and supporting water-quality monitoring. Autonomous marine platforms can provide technological foundations for future systems designed to detect environmental anomalies, document pollution, and support more informed responses to marine environmental challenges.

The significance of Navi İDA lies in its combination of student-led research, nationally recognised software innovation, and technological capabilities relevant to marine sustainability. While the team's documented achievements primarily demonstrate autonomous marine engineering and software development, its technological approach offers opportunities for applications in marine environmental monitoring and sustainable resource management.

Beyond SDG 14, the initiative contributes to SDG 9 (Industry, Innovation and Infrastructure) by advancing artificial intelligence, autonomous systems, and maritime engineering innovation. It also supports SDG 4 (Quality Education) by providing students with interdisciplinary, project-based learning opportunities that connect academic knowledge with practical technological development.

Through Navi İDA, Bahçeşehir University demonstrates how student-led innovation can strengthen marine research capacity and contribute to the technological foundations of ocean sustainability. By developing award-winning autonomous marine technologies and encouraging the application of artificial intelligence to maritime challenges, the university supports the advancement of scientific and engineering capabilities relevant to the long-term protection and sustainable management of marine ecosystems under SDG 14: Life Below Water.

Climate Change Summit: The Climate Crisis as a Sustainability Issue





In the 2024–2025 academic year, CIFAL Istanbul, UNITAR, and Bahçeşehir University (BAU) jointly organized the "Climate Change Summit: The Climate Crisis as a Sustainability Issue" in collaboration with Azerbaijan Technical University (AzTU), the Young Researchers Innovation Club (HİK), and BilimSenOl. Held at Azerbaijan Technical University in Baku, the summit brought together academics, researchers, and students to examine the growing intersection between climate change and sustainability.

The event featured contributions from Prof. Dr. Çisil Sohodol, Director of CIFAL Istanbul–UNITAR; Dr. Yasemin Ülker from the BAU Faculty of Economics, Administrative and Social Sciences; and Dr. Nilüfer Geysi from the BAU Faculty of Communication. Discussions explored how the climate crisis has developed from an environmental challenge into a broader sustainability issue encompassing social responsibility, energy transformation, and communication strategies for raising public awareness.

Through its multidisciplinary approach, the summit highlighted Bahçeşehir University's ongoing commitment to global climate education and international dialogue addressing the social, economic, and environmental dimensions of climate change. Its consideration of the wider environmental consequences of the climate crisis was also relevant to SDG 14: Life Below Water, as climate change places increasing pressure on oceans, coastal environments, and marine biodiversity. By strengthening climate awareness and encouraging more responsible environmental action, the summit supported the broader conditions required for protecting marine ecosystems and improving their resilience to climate-related threats. The initiative also contributed directly to SDG 13: Climate Action by advancing dialogue on climate resilience and to SDG 17: Partnerships for the Goals by fostering cross-border cooperation between Türkiye and Azerbaijan in sustainability-oriented education and research.

BAU Genç TEMA's Nature and Water Awareness Workshop



In the 2024–2025 academic year, BAU Genç TEMA, the environmental student club of Bahçeşehir University, delivered the "Nature and Water Awareness Workshop" at Biltes College in Istanbul. Designed to foster environmental awareness from an early age, the workshop introduced young learners to environmental responsibility, sustainable living, and the mission of the TEMA Foundation, with which the club is affiliated. The initiative extended sustainability education beyond the university campus, encouraging younger generations to understand their role in protecting natural resources and aquatic ecosystems.

Throughout the workshop, BAU Genç TEMA members emphasised the interconnectedness of soil, water, terrestrial ecosystems, and marine environments, helping students understand how environmental conditions on land can directly influence the health of rivers, coastal waters, and seas. Through interactive examples and storytelling, participants explored the importance of protecting water resources, preventing environmental pollution, and adopting responsible everyday practices that reduce pressures on natural ecosystems.

A particularly important dimension of the workshop was its connection to SDG 14 (Life Below Water), especially Target 14.1, which calls for preventing and significantly reducing marine pollution from land-based activities. By highlighting the relationship between environmental responsibility on land and the protection of aquatic environments, the initiative helped students recognise how waste, pollution, and unsustainable resource use can affect waterways and ultimately reach coastal and marine ecosystems.

The workshop also reinforced the importance of protecting marine biodiversity through preventive environmental awareness and responsible behaviour. By encouraging children to understand the consequences of pollution and the ecological connections between land and water, the initiative promoted the knowledge and attitudes necessary to support long-term aquatic ecosystem conservation. Its educational approach demonstrated how early environmental learning can contribute to a broader culture of marine stewardship and collective responsibility for the protection of life below water.

Beyond SDG 14, the initiative supported SDG 6 (Clean Water and Sanitation) through its emphasis on water conservation and the protection of water-related ecosystems, SDG 4 (Quality Education) by providing accessible sustainability education to schoolchildren, and SDG 15 (Life on Land) through awareness of soil and terrestrial ecosystem conservation. It also contributed to SDG 17 (Partnerships for the Goals) by strengthening cooperation between Bahçeşehir University's student community and Biltes College in promoting environmental education and sustainability awareness.

Roundtable with Civil Society: "Towards COP29 – Evaluating Challenges, Solutions, and Policy Pathways for Climate Action in Türkiye"



In the 2024–2025 academic year, Bahçeşehir University and CIFAL Istanbul–UNITAR, in collaboration with the Corporate Social Responsibility Association of Türkiye (CSR Turkey) and several leading environmental NGOs, organised the high-level roundtable "Towards COP29: Civil Society Evaluates." The meeting brought together civil society representatives, academics, and policy experts to assess Türkiye's environmental and climate agenda following COP28 and contribute to the development of national strategies ahead of COP29.

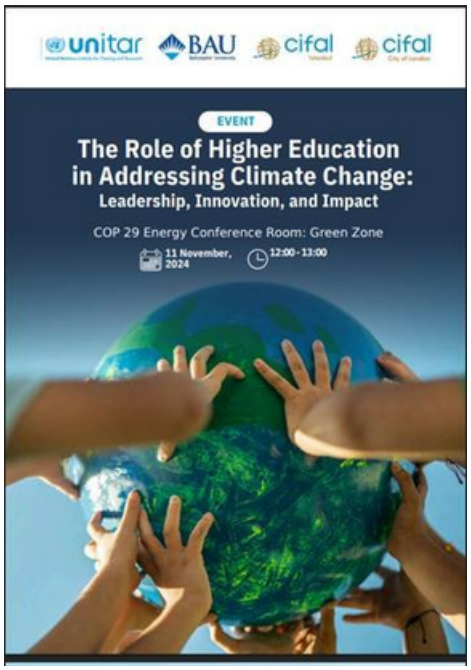
The roundtable provided a policy dialogue platform for discussing the role of civil society in advancing climate action, supporting the transition to renewable energy, and integrating sustainability into national development frameworks. Contributions from Özlem Katısöz, Climate and Energy Policy Coordinator at CAN Europe, and Barış Doğru, Editor-in-Chief of EkoIQ, offered analytical perspectives on Türkiye's evolving climate policy landscape, including progress and continuing challenges in fulfilling international environmental commitments.

Participants emphasised the need for a realistic roadmap to reduce dependence on fossil fuels and expand investments in renewable energy. Such measures are also relevant to SDG 14: Life Below Water, as reducing greenhouse gas emissions and strengthening environmental governance can help address climate-related pressures on marine and coastal ecosystems. Integrating the protection of aquatic environments into national climate strategies is important for improving ecosystem resilience and ensuring that climate policies account for the interconnected health of the atmosphere, land, and oceans.

By fostering informed discussion and cross-sector collaboration, the roundtable contributed to SDG 14 by supporting policy conditions relevant to marine conservation and the protection of aquatic ecosystems from climate-related threats. It also directly supported SDG 13: Climate Action by advancing climate-policy dialogue and awareness of climate resilience, SDG 17: Partnerships for the Goals through cooperation among academia, civil society, and policy experts, and SDG 16: Peace, Justice and Strong Institutions by encouraging inclusive, participatory, and evidence-based environmental governance.



Special Session at COP29: Bahçeşehir University and United Nations Institute for Training and Research (UNITAR)– Advancing Climate Policy, Education, and Global Best Practices



On November 11, 2024, during the United Nations Climate Change Conference (COP29) in Baku, Azerbaijan, a landmark session titled "The Role of Higher Education in Addressing Climate Change: Leadership, Innovation, and Impact" was co-organized by UNITAR, CIFAL Istanbul, Bahçeşehir University, and CIFAL City of London. Marking the first time a Turkish university hosted an independent session at COP, this event positioned Bahçeşehir University as a key contributor to global climate dialogue and higher education's policy impact.

The session convened academic leaders, policymakers, and sustainability experts to explore how universities can shape climate solutions through research, education, and innovation. Discussions focused on embedding climate literacy across curricula, promoting interdisciplinary collaboration, and developing science-based strategies for resilience and adaptation. Participants emphasized that universities play a pivotal role not only in knowledge generation, but also in influencing national and international climate policy through research-driven insights and stakeholder engagement.

In alignment with UNITAR's global learning objectives, the session highlighted best practices and comparative approaches to integrating climate change education into higher education, fostering capacity-building initiatives for young leaders, educators, and decision-makers. Expected outcomes included the creation of cross-regional networks between universities, NGOs, and government institutions; the sharing of case studies and innovative models; and the development of policy frameworks to accelerate sustainable transformation.

Representing Türkiye's academic leadership on the global stage, Prof. Dr. Esra Hatipoğlu, Rector of Bahçeşehir University, and Prof. Dr. Çisil Sohodol, Director of CIFAL Istanbul, shared the institution's experience in advancing sustainability-centered education and community partnerships. The session was moderated by Dr. Ebru Canan-Sokullu, Associate Director at the CIFAL Global Network (UNITAR), who underscored the importance of university–organization cooperation in shaping effective climate governance frameworks.



By integrating education, research, policy development, and international best practice exchange, this pioneering COP29 special session exemplified Bahçeşehir University's leadership in sustainable transformation. The session was also relevant to SDG 14: Life Below Water, as climate education, interdisciplinary research, and science-based policymaking are essential to addressing the effects of climate change on oceans, coastal areas, and marine biodiversity. Strengthening institutional capacity to understand and respond to ocean warming, ecosystem degradation, and other climate-related pressures supports the development of more resilient marine and coastal environments. By integrating education, research, policy development, and international best-practice exchange, the session contributed to SDG 14 while reinforcing commitments to SDG 13: Climate Action, SDG 4: Quality Education, and SDG 17: Partnerships for the Goals.

Sustainable Water Use in Hydrogen Production: 12th International Conference on Photosynthesis and Hydrogen Energy at Bahçeşehir University

In the 2024-2025 academic year, Bahçeşehir University's Faculty of Engineering and Natural Sciences hosted the 12th International Conference on "Photosynthesis and Hydrogen Energy Research for Sustainability-2024" in Istanbul. Bringing together scholars, researchers and industry professionals from different countries, the conference provided an international platform for exchanging knowledge on photosynthesis, biological hydrogen production and sustainable energy technologies. Discussions also addressed the relationship between hydrogen production and water resources, highlighting the importance of integrating water sustainability and aquatic ecosystem protection into the development of cleaner energy systems.

The scientific programme covered photosynthetic electron transfer, water oxidation, biological hydrogen production, hydrogen purification and storage, and developments in the global hydrogen economy. Within these discussions, participants considered water consumption in hydrogen production, opportunities for the responsible use of wastewater, and approaches to protecting water resources. These topics highlighted the need to improve water-use efficiency and assess alternative water sources as hydrogen technologies develop. They also drew attention to the importance of ensuring that the transition to low-carbon energy does not create additional pressures on water quality or aquatic environments.

Although the conference primarily addressed sustainable energy and water-resource management, its discussions also supported SDG 14: Life Below Water by promoting cleaner production methods and responsible water and wastewater management. Improving water-use efficiency and exploring the safe use of treated wastewater can help reduce pressure on natural water systems and limit pollution pathways that may ultimately affect coastal and marine ecosystems. By connecting energy innovation with the protection of water resources, the conference encouraged an integrated approach to safeguarding aquatic environments.

The conference also contributed to SDG 6: Clean Water and Sanitation through scientific exchange on water-use efficiency, wastewater use and water-resource protection; SDG 7: Affordable and Clean Energy through its focus on sustainable hydrogen technologies; and SDG 13: Climate Action through research relevant to lower-emission energy systems. Bahçeşehir University's hosting role further supported SDG 17: Partnerships for the Goals by facilitating international knowledge exchange and collaboration among academic researchers and industry professionals.





Green Dialogue Meeting: Climate Law, Marine Conservation and Environmental Accountability

On 27 December 2025, The Green Dialogue Meeting examined the role of climate law in translating environmental commitments into binding and enforceable public policy. Discussions addressed how legal frameworks can support Türkiye's 2053 net-zero emissions and green development objectives by regulating greenhouse gas emissions, establishing reduction mechanisms and defining the environmental responsibilities of public institutions and economic actors. Particular attention was given to the importance of legal accountability in preventing and responding to ecological disasters, including those that threaten seas, coastal areas and marine biodiversity.

The meeting also considered the alignment of domestic climate policy with the Paris Agreement and other international environmental commitments. Participants discussed how clear legal obligations, effective monitoring systems and enforceable accountability mechanisms can strengthen the protection of natural resources and ensure timely institutional responses to environmental harm. In discussions on ecological disasters, marine conservation was highlighted as an important component of environmental governance, particularly in relation to preventing pollution, protecting coastal and marine habitats, and strengthening the resilience of aquatic ecosystems against climate-related pressures.

The meeting contributed to SDG 14: Life Below Water by emphasising the role of environmental law, institutional oversight and accountability mechanisms in preventing marine pollution and protecting coastal and marine ecosystems. By connecting marine conservation with climate policy and disaster prevention, the meeting promoted an integrated approach to safeguarding aquatic biodiversity and ensuring the sustainable use of marine resources. It also supported SDG 13: Climate Action through its focus on emissions reduction and climate resilience, SDG 16: Peace, Justice and Strong Institutions through its emphasis on transparent and enforceable environmental governance, SDG 7: Affordable and Clean Energy through discussion of the green-energy transition, and SDG 4: Quality Education by advancing climate and environmental awareness through informed public dialogue.



The Importance of Water and Waterways Seminar: Sustainable Water Management and Aquatic Ecosystem Protection



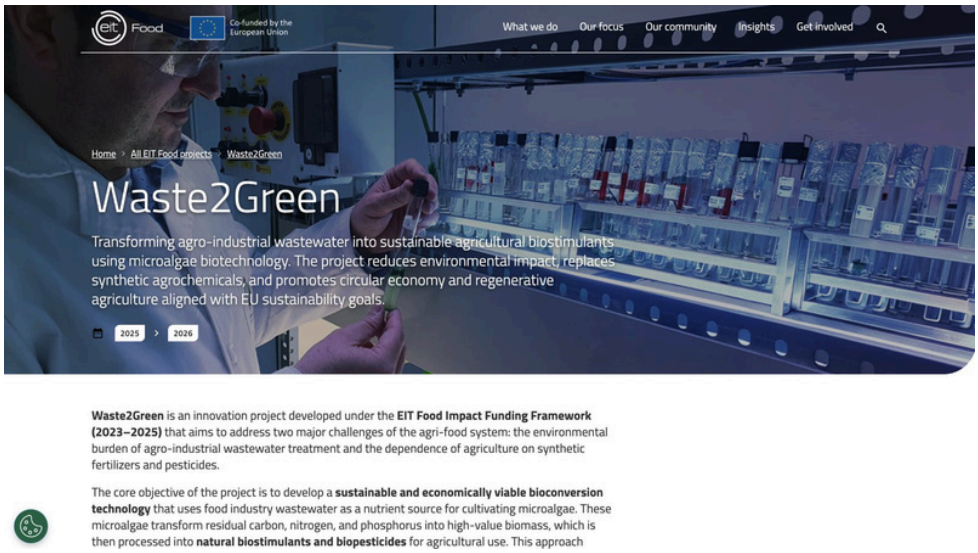
On 21 March 2025, organised in collaboration with the BAU Faculty of Economics, Administrative and Social Sciences and CIFAL Istanbul (UNITAR), the seminar "The Importance of Water and Waterways" raised awareness of the conservation and sustainable management of water resources, with particular emphasis on the interconnectedness of inland waterways, coastal environments, and marine ecosystems. The event highlighted the essential role of water in sustaining biodiversity, supporting communities and economic activities, and maintaining ecological balance, encouraging participants to recognise water conservation as a shared environmental and societal responsibility.

The seminar explored the importance of efficient water use, pollution prevention, and responsible management of rivers and waterways. By examining how activities along inland waterways can influence downstream water quality and coastal ecosystems, the discussions highlighted the need to protect aquatic environments from pollution and environmental degradation. The event encouraged participants to consider how sustainable water management practices can contribute to healthier aquatic habitats and the long-term conservation of water-dependent biodiversity.

A central theme was the ecological connection between freshwater systems and marine environments. Rivers and waterways transport water, sediments, nutrients, and pollutants across interconnected ecosystems, meaning that unsustainable practices upstream can have consequences for coastal waters and marine life. By drawing attention to these relationships, the seminar reinforced the importance of integrated water management, pollution prevention, and collective environmental responsibility in protecting aquatic ecosystems.

The initiative particularly supported SDG 14 (Life Below Water), especially Target 14.1, which calls for the prevention and significant reduction of marine pollution, particularly from land-based activities. By promoting awareness of how waterway management and pollution prevention contribute to the protection of coastal and marine ecosystems, the seminar highlighted the importance of addressing environmental pressures at their source. It also contributed to SDG 6 (Clean Water and Sanitation) through its emphasis on sustainable water management and the protection of water-related ecosystems, SDG 4 (Quality Education) through public environmental education, and SDG 17 (Partnerships for the Goals) through collaboration between Bahçeşehir University and CIFAL Istanbul (UNITAR).

Waste2Green: Converting Agricultural and Industrial Waste into Green Solutions through Microalgae Biotechnology



Bahçeşehir University participates in Waste2Green, an international research and innovation project supported through the EIT Food Impact Funding Framework, bringing together expertise in biotechnology, sustainable agriculture, wastewater management and circular resource use. The project aims to transform agro-industrial wastewater from an environmental management challenge into a valuable resource for developing innovative agricultural products, demonstrating the potential of biotechnology to contribute to more sustainable and resource-efficient food systems.

Bahçeşehir University's contribution is led by Dr. Alper Devrim Özkan, from the Department of Pharmaceutical Microbiology, Faculty of Pharmacy. Within the international consortium, BAU is responsible for characterising microalgal biomass and evaluating its potential applications as a biostimulant and biopesticide, including laboratory investigations of plant growth and protection against plant diseases. These activities involve algal characterisation, sequencing and biological activity assessments using model crops, contributing scientific evidence on the potential effectiveness of microalgae-derived agricultural products.

By connecting wastewater nutrient recovery with the development of biological agricultural inputs, Waste2Green addresses two interconnected sustainability challenges: reducing the environmental pressures associated with agro-industrial waste and developing alternatives that could support productive, resilient and environmentally responsible agriculture. BAU's participation brings pharmaceutical microbiology expertise into an interdisciplinary research framework linking environmental biotechnology, agricultural innovation and the circular bioeconomy.

Waste2Green addresses SDG 6 (Clean Water and Sanitation) by exploring innovative approaches to agro-industrial wastewater treatment and resource recovery.

The project uses wastewater as a cultivation medium for microalgae, which can assimilate residual nutrients, including nitrogen and phosphorus, during biomass production. This process creates an opportunity to recover valuable nutrients from wastewater streams while producing biomass with potential agricultural applications.

By treating wastewater as a resource rather than solely as a waste product, the project contributes to the development of more circular approaches to water management. Its research is relevant to reducing nutrient pollution, improving the efficiency of wastewater treatment processes and exploring opportunities to decrease the demand for additional resources in biomass cultivation.

These objectives are particularly relevant to SDG Target 6.3, which calls for improving water quality by reducing pollution and increasing wastewater treatment, recycling and safe reuse.

The project's contribution lies in developing and validating biological treatment and recovery technologies, with their actual effectiveness in reducing wastewater pollution to be established through technical assessment.

By integrating waste recovery, biotechnology, product development and traceability, Waste2Green demonstrates how innovation can help redesign production processes around resource efficiency and circularity.

Waste2Green contributes to research relevant to SDG 13 (Climate Action) by exploring technologies with the potential to reduce the environmental footprint of agricultural inputs and wastewater processing.

Its approach combines biological nutrient recovery with the development of agricultural products that may reduce dependence on certain conventional synthetic inputs. By investigating resource-efficient biological processes and alternative agricultural products, the project supports the development of technologies relevant to climate-responsive and environmentally sustainable agri-food systems.

The proposed modular processing approach may also create opportunities to examine resource use and processing efficiency at the source of wastewater generation.

However, potential reductions in energy consumption or greenhouse gas emissions require comparative lifecycle assessment and technical validation. The project's contribution to SDG 13 therefore lies in advancing research into potentially lower-impact production pathways rather than demonstrating quantified emissions reductions at this stage.

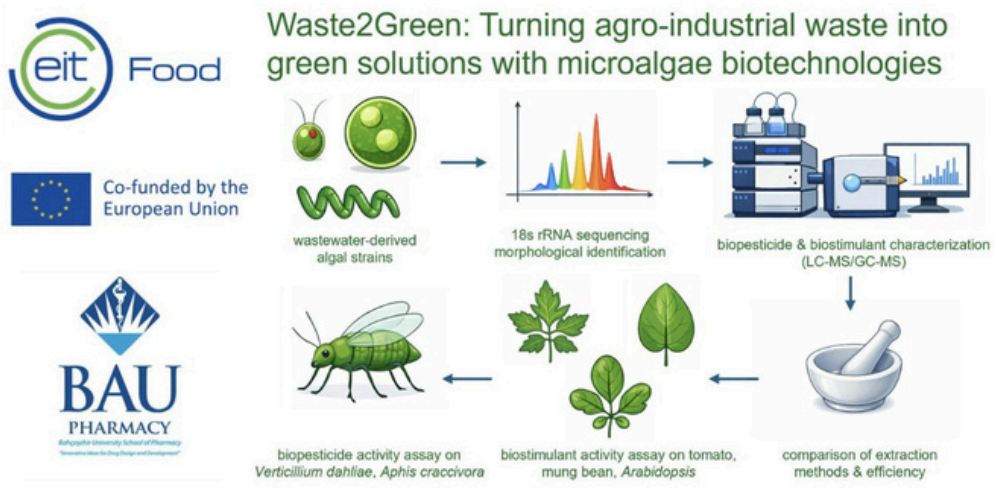
Waste2Green has a relevant connection to SDG 14 (Life Below Water) through its focus on recovering nutrients from agro-industrial wastewater and developing biological agricultural products.

Excessive nutrient discharge into aquatic environments can contribute to eutrophication and the deterioration of water quality. By investigating microalgal processes capable of recovering nitrogen and phosphorus from wastewater, the project explores a potential pathway for reducing nutrient loads before treated water reaches receiving environments.

Similarly, the development of effective biological alternatives to certain conventional agricultural inputs may offer opportunities to reduce pollution pressures associated with agricultural runoff.

These research directions are relevant to SDG Target 14.1, which addresses marine pollution, including nutrient pollution originating from land-based activities.

By transforming the relationship between agricultural waste and agricultural production, Waste2Green represents an innovative approach to sustainability in which wastewater becomes a potential source of valuable biological resources. Bahçeşehir University's research contribution helps advance the scientific assessment of this approach, supporting the development of agricultural technologies that seek to improve productivity, recover resources and reduce environmental pressures across the food system.



The Lost Sea: Documenting the Aral Sea's Environmental Collapse and the Future of Water and Ecosystem Sustainability

Initiated in 2025, the Aral Sea Documentary Project is an international documentary production exploring one of the world's most significant environmental transformations: the dramatic shrinkage of the Aral Sea and its consequences for ecosystems, natural resources, and communities across Central Asia. Filmed in Uzbekistan, Kazakhstan, and Turkmenistan, the project examines the historical, environmental, social, and cultural dimensions of the Aral Sea crisis, bringing together perspectives from academics, environmental activists, government representatives, and local communities.

Once one of the world's largest inland lakes, the Aral Sea has undergone extensive environmental degradation, largely resulting from large-scale irrigation policies and the diversion of rivers during the Soviet era. Its transformation represents a striking example of the long-term consequences of unsustainable water resource management, demonstrating how decisions concerning agricultural production and natural resource use can profoundly affect ecosystems, biodiversity, and human livelihoods.

Beyond its environmental significance, the Aral Sea holds an important place in the historical and cultural identity of the peoples of Central Asia and the wider Turkic world. The documentary explores this relationship between people and their environment, examining how ecological transformation has reshaped local communities, cultural memory, and perceptions of the future.

Through interviews, field observations, and documentary storytelling, the project seeks to connect scientific knowledge with lived experiences, encouraging reflection on the environmental consequences of human activity and the importance of sustainable development policies.

The documentary establishes a particularly strong connection with SDG 6 (Clean Water and Sanitation) by examining the consequences of unsustainable water management and large-scale irrigation practices that contributed to the Aral Sea's dramatic decline.

By documenting the historical processes behind the depletion of the lake and their environmental and social consequences, the project highlights the importance of responsible water allocation, long-term resource planning, and integrated approaches to water management.

The Aral Sea crisis demonstrates that water sustainability extends beyond access to drinking water and sanitation. It also requires the protection of freshwater ecosystems, the responsible management of shared water resources, and consideration of the long-term environmental consequences of agricultural and economic development.

The documentary also offers a perspective relevant to SDG 14 (Life Below Water) through its examination of aquatic ecosystem degradation and biodiversity loss associated with the shrinking of the Aral Sea. By highlighting the collapse of aquatic habitats and the far-reaching consequences of biodiversity loss, the documentary reinforces SDG 14 (Life Below Water) through its emphasis on aquatic ecosystem conservation, the protection of water-dependent species, and the importance of sustainable resource management in safeguarding aquatic biodiversity for future generations.

The dramatic reduction of the lake's water volume and the transformation of its aquatic habitats illustrate the vulnerability of water-dependent biodiversity to unsustainable resource management.

By exploring the environmental consequences of the Aral Sea crisis, the project raises broader awareness of the importance of protecting aquatic ecosystems, maintaining ecological balance, and preventing irreversible biodiversity loss.



Bahçeşehir University's Research Contributions to SDG 14: Life Below Water (2021–2025)

According to SciVal data, Bahçeşehir University contributed 9 publications classified under SDG 14: Life Below Water during the 2021–2025 period. These publications achieved a Field-Weighted Citation Impact (FWCI) of 1.38, indicating that they received 38% more citations than the global average for comparable publications, adjusted for subject field, publication year and publication type. This research addresses topics including aquatic pollution, marine biodiversity, plastic waste management and the sustainability of coastal communities.

The publications examine issues such as heavy metal contamination and phytoplankton composition, the accumulation of trace elements in marine sediments, and environmental factors shaping the genetic structure of marine populations. Other studies explore contamination in fishery products and mussels, the potential of plants for environmental remediation, and sustainable development challenges in coastal settlements. Together, these contributions provide scientific knowledge relevant to understanding pressures on aquatic environments and informing approaches to their protection and sustainable management.

The figure below presents Bahçeşehir University's publications classified under SDG 14 for the 2021–2025 period, including publication titles, authors, years and sources.

SDG 14: Life Below Water
BAU Publications (2021-2025)

Source: Scopus / SciVal | 9 publications | Data updated: 25 October 2026

No.	Year	Publication Title	Authors	Journal / Publication Source
1	2021	A case study performed in küçükçekmece lagoon channel/istanbul, turkey: How the heavy metal contamination and the seasonal variations on phytoplankton composition influence water quality	Yilmaz, N.; Ozyigit, I.I.; Dogan, I.; Demir, G.; Yalcin, I.E.	Desalination and Water Treatment
2	2022	An approach to assess PWR methods to cope with physical barriers on plastic waste disposal and exploration from developing nations	Narayanamoorthy, S.; Manirathinam, T.; Geetha, S.; Salahshour, S.; Ahmadian, A.; Kang, D.	Expert Systems with Applications
3	2022	Chronology of trace elements and radionuclides using sediment cores in Golden Horn Estuary, Sea of Marmara	Gözel, F.; Belivermiş, M.; Sezer, N.; Kurt, M.A.; Sıkdokur, E.; Kılıç, Ö.	Environmental Pollution
4	2022	The Korteweg-de Vries–Caudrey-Dodd-Gibbon dynamical model: Its conservation laws, solitons, and complexiton	Hosseini, K.; Akbulut, A.; Baleanu, D.; Salahshour, S.; Mirzazadeh, M.; Dehingia, K.	Journal of Ocean Engineering and Science
5	2023	The Intertwined Effects of Hydrographic Barriers, Palaeoclimate and Life History on Genetic Structure of Marine Populations: A Case Study of Two Marine Invertebrates	Tezcan, E.K.; Hemond, E.M.; Karhan, S.Ü.; Bilgin, R.	Mediterranean Marine Science
6	2025	Comparison of Virulence, Resistance Genes, and SCCmec Types in CoNS and Staphylococcus aureus Strains Isolated from Raw Cow Milk Samples	Mamal Torun, M.; Ekici, S.; Dincer, S.; Kara, İ.; Özmen, A.; Piyadeoğlu, D.; Elbizim, D.S.; Güler, B.; Aksaray, S.; Aktepe, O.C.; Demirci, M.; Dülger, D.	Kafkas Universitesi Veteriner Fakultesi Dergisi
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8	2025	Phytoremediation potential and ecophysiological features of water hyacinth Eichornia crassipes: a case study from Orontes River, Türkiye	Yalcin, I.E.; Altay, V.; Ozturk, M.	Journal of Environmental Science and Health - Part A Toxic/Hazardous Substances and Environmental Engineering
9	2025	Rethinking sustainable development goals (SDG) for floating slums in African coastal settings: Makoko community in Nigeria	Seçmen, S.; Ibrahim, F.A.	Cities

Article: “Comparison of Dietary Supplementation with Krill Oil, Fish Oil, and Astaxanthin on an Experimental Ethanol-Induced Gastric Ulcer Model: A Biochemical and Histological Study”


Comparison of Dietary Supplementation with Krill Oil, Fish Oil, and Astaxanthin on an Experimental Ethanol-Induced Gastric Ulcer Model: A Biochemical and Histological Study

Abstract

Published as a peer-reviewed article by Esra Tansu Sarıyer, Murat Baş, Hatice Çolak, Naziye Özkan Yenal, Özlem Unay Demirel, and Meral Yüksel (EID: 2-s2.0-85207678584), this research brings together academic expertise from Acıbadem Mehmet Ali Aydınlar University, University of Health Sciences, Üsküdar University, Marmara University, and Bahçeşehir University (Türkiye).

The study investigates the protective effects of krill oil, fish oil, and astaxanthin against oxidative stress and inflammatory damage in an experimental gastric ulcer model. By comparing the biological activities of these compounds, the research contributes to scientific understanding of marine-derived bioactive substances and their potential applications in health and nutrition.

The research contributes to SDG 14 (Life Below Water) by advancing scientific knowledge of biologically valuable compounds obtained from marine organisms, highlighting the importance of marine biodiversity as a source of resources for scientific and medical research. Krill and fish are integral components of marine food webs, and their use in producing bioactive compounds illustrates the relationship between marine ecosystems, biological resources, and human health.

The study also highlights the relevance of SDG 14.2 (Protect and Restore Ecosystems) and SDG 14.4 (Sustainable Fishing) by demonstrating the scientific value of marine biological resources whose long-term availability depends on healthy ecosystems and responsible harvesting practices. Understanding the potential applications of marine-derived compounds reinforces the importance of conserving marine biodiversity and maintaining the ecological conditions that sustain these resources.

While the study primarily examines biomedical effects rather than marine conservation or harvesting practices, its findings provide a scientific context for recognising the value of marine biodiversity and the importance of its sustainable use.

The research also aligns with SDG 3 (Good Health and Well-being) through its investigation of potential protective effects against gastric tissue damage and SDG 12 (Responsible Consumption and Production) through the broader relevance of responsible marine-resource utilisation. Its collaboration across multiple universities further supports SDG 17 (Partnerships for the Goals) through interdisciplinary scientific knowledge exchange.

Article: “Exploring the Dynamic Capabilities of Technology Provider Ecosystems: A Study of Smart Manufacturing Projects”



In 2024-2025 academic year, published as a peer-reviewed article by Aldo Stornelli, Christopher Simms, Wiebke Reim, and Sercan Ozcan (EID: 2-s2.0-85185846409), this research brings together academic expertise from the University of Portsmouth (UK), Luleå University of Technology (Sweden), Bahçeşehir University (Türkiye), and Azerbaijan State University of Economics (UNEC, Azerbaijan).

The study investigates how technology provider ecosystems develop dynamic capabilities in technology search and learning, robust implementation, and cross-organizational knowledge transfer to enable smart-manufacturing solutions. By examining the role of collaborative innovation networks, the research provides insights into how industrial organizations can adopt advanced technologies, improve resource efficiency, and integrate sustainability and circular economy principles into manufacturing processes.

The research contributes to SDG 14 (Life Below Water), particularly Target 14.1, through its relevance to reducing the environmental pressures associated with industrial production and land-based pollution. Industrial activities can affect aquatic and marine ecosystems through inefficient resource use, waste generation, and the release of pollutants into waterways. The development of smarter, more resource-efficient manufacturing systems offers opportunities to address these pressures at their source, supporting broader efforts to protect water quality and reduce pollution reaching coastal and marine environments.

By examining how technology providers collaborate to develop and implement innovative manufacturing solutions, the study identifies organizational capabilities that could facilitate the adoption of cleaner production practices and circular resource management. These capabilities are relevant to preventing industrial waste, improving material efficiency, and supporting technological approaches that reduce the potential transfer of land-based pollutants into aquatic ecosystems. The research therefore provides an indirect but meaningful contribution to the industrial sustainability practices that underpin marine pollution prevention.

The study also supports SDG 9 (Industry, Innovation and Infrastructure) by advancing knowledge of smart manufacturing and industrial innovation, SDG 12 (Responsible Consumption and Production) through its relevance to resource efficiency and circular economy practices, and SDG 13 (Climate Action) through opportunities for more environmentally sustainable production systems. Its international research collaboration and emphasis on cross-organizational knowledge transfer further align with SDG 17 (Partnerships for the Goals).

Conference Proceeding: "Detection of Human Breathing Using Signal Processing Techniques Under Debris"



The study, co-authored by Nurhan Turker Tokan (EID: 2-s2.0-85203682006), involves researchers affiliated with Bahçeşehir University, Faculty of Engineering and Natural Sciences (Istanbul, Türkiye); Kocaeli University, Faculty of Engineering (Kocaeli, Türkiye); and Yıldız Technical University, Faculty of Electrical and Electronics (Istanbul, Türkiye).

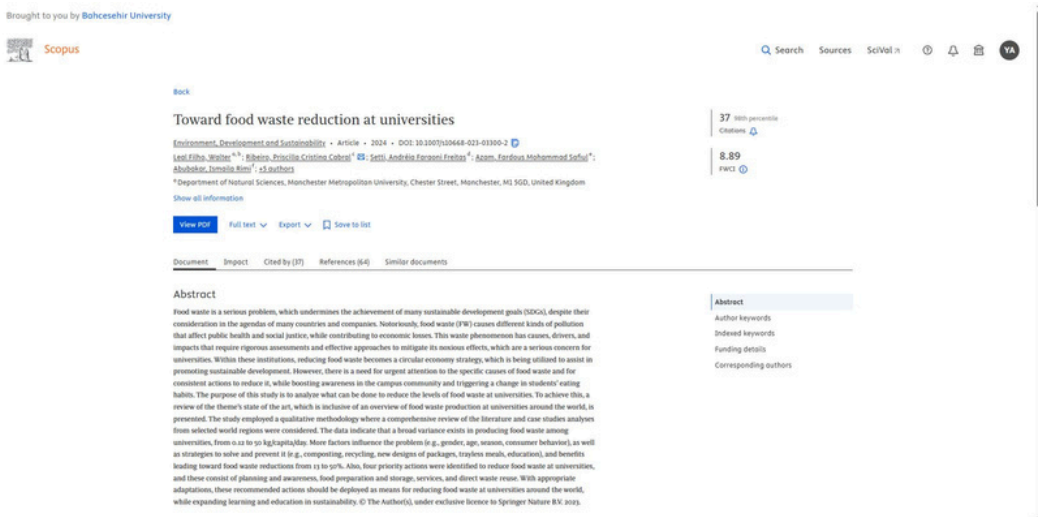
The research investigates advanced radar-based signal processing methods, including Short-Time Fourier Transform (STFT), wavelet analysis, and denoising techniques, to detect survivors trapped beneath rubble using a controlled laboratory debris model. By improving the identification of signals within complex debris environments, the study contributes to the development of sensing technologies relevant to disaster response, emergency management, and resilient infrastructure.

The study offers potential technological relevance to SDG 14 (Life Below Water), particularly Target 14.1, which focuses on reducing marine pollution from land-based activities. Disasters can generate substantial quantities of debris and solid waste, some of which may enter rivers, coastal waters, and marine environments through flooding, runoff, and inadequate waste management. Advanced sensing and signal-processing technologies, such as those investigated in this research, provide a methodological foundation that could inform future developments in debris detection and environmental monitoring.

Its technological approach illustrates opportunities for adapting advanced sensing systems to environmental challenges associated with disaster-generated waste. Such future applications could support more effective debris identification and management, contributing indirectly to efforts to prevent solid waste from reaching aquatic and marine ecosystems.

The research contributes more directly to SDG 11 (Sustainable Cities and Communities) by advancing technologies relevant to disaster preparedness, emergency response, and urban resilience. It also aligns with SDG 9 (Industry, Innovation and Infrastructure) through innovation in radar sensing and signal processing, while supporting broader disaster resilience objectives associated with SDG 13 (Climate Action).

Article: "Toward Food Waste Reduction at Universities"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Toward food waste reduction at universities

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Abstract

Food waste is a serious problem, which undermines the achievement of many sustainable development goals (SDGs), despite their consideration in the agendas of many countries and companies. Notoriously, food waste (FW) causes different kinds of pollution that affect public health and social justice, while contributing to economic losses. This waste phenomenon has causes, drivers, and impacts that require rigorous assessments and effective approaches to mitigate its noxious effects, which are a serious concern for universities. Within these institutions, reducing food waste becomes a circular economy strategy, which is being utilized to assist in promoting sustainable development. However, there is a need for urgent attention to the specific causes of food waste and for consistent actions to reduce it, while boosting awareness in the campus community and triggering a change in students' eating habits. The purpose of this study is to analyze what can be done to reduce the levels of food waste at universities. To achieve this, a review of the theme's state of the art, which is inclusive of an overview of food waste production at universities around the world, is presented. The study employed a qualitative methodology where a comprehensive review of the literature and case studies analyses from selected world regions were considered. The data indicate that a broad variance exists in producing food waste among universities, from 0.12 to 50 kg/capita/day. More factors influence the problem (e.g., gender, age, season, consumer behavior), as well as strategies to solve and prevent it (e.g., composting, recycling, new designs of packages, trayless meals, education), and benefits leading toward food waste reductions from 13 to 50%. Also, four priority actions were identified to reduce food waste at universities, and these consist of planning and awareness, food preparation and storage, services, and direct waste reuse. With appropriate adaptations, these recommended actions should be deployed as means for reducing food waste at universities around the world, while expanding learning and education in sustainability. © The Author(s), under exclusive licence to Springer Nature B.V. 2023.

Abstract
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Indexed keywords
Funding details
Corresponding authors

In the 2024–2025 academic year, a peer-reviewed research article authored by Walter Leal Filho, Priscilla Cristina Cabral Ribeiro, Andréia Faraoni Freitas Setti, Fardous Mohammad Safiul Azam, Ismaila Rimi Abubakar, Julen Castillo-Apraiz, Unai Tamayo, Pınar Gökçin Özuyar, Kamila Frizzo, and Bruno Borsari (EID: 2-s2.0-85158171171) examined the drivers of food waste in higher-education institutions and strategies for reducing its environmental impact.

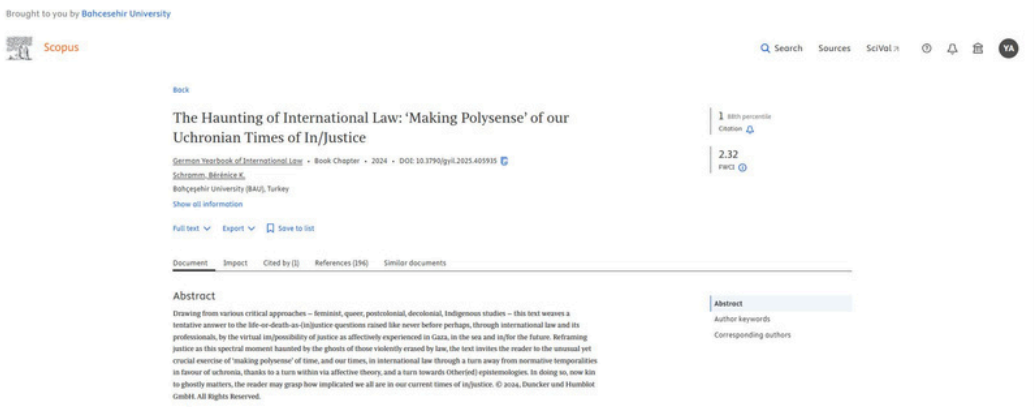
The authors represent institutions across several countries, including Manchester Metropolitan University (UK), Hamburg University of Applied Sciences (Germany), Fluminense Federal University (Brazil), University of Aveiro (Portugal), Neijiang Normal University (China), Imam Abdulrahman Bin Faisal University (Saudi Arabia), University of the Basque Country (Spain), Bahçeşehir University (Türkiye), Federal University of Santa Maria (Brazil), and Winona State University (USA).

The study investigates the key drivers of food waste in higher education and evaluates mitigation strategies, including composting, packaging redesign, trayless dining, and awareness programmes. It emphasises campus-level circular economy practices and demonstrates how behavioural change, infrastructure design, and educational initiatives can collectively reduce waste generation, improve resource efficiency, and minimise the environmental consequences of food consumption and disposal.

The research contributes to SDG 14 (Life Below Water), particularly Target 14.1, which focuses on preventing and significantly reducing marine pollution from land-based activities. Food waste and its improper disposal can contribute to water pollution through organic waste, nutrient-rich runoff, and the discharge of pollutants into waterways that ultimately connect with coastal and marine ecosystems. Excessive nutrient inputs can contribute to eutrophication, oxygen depletion, and the deterioration of aquatic habitats, placing additional pressure on aquatic biodiversity.

By identifying practical food-waste prevention and management strategies within university environments, the study provides evidence relevant to reducing land-based sources of aquatic and marine pollution. Its examination of waste reduction, composting, and more sustainable consumption practices highlights opportunities for higher-education institutions to limit waste-related environmental pressures before they reach rivers, coastal waters, and marine ecosystems. In this way, the research reinforces the importance of addressing pollution at its source as part of broader efforts to protect water quality, aquatic biodiversity, and ecosystem health.

Book Chapter: "The Haunting of International Law: 'Making Polysense' of Our Uchronian Times of In/Justice"



In 2024-2025 academic year, published as a book chapter by Bérénice K. Schramm (EID: 2-s2.0-105013487736), affiliated with Bahçeşehir University (BAU), Türkiye.

This work examines how critical approaches to international law reframe questions of justice—including those connected to marine and coastal governance—through alternative temporal and epistemological perspectives. The chapter deepens the conceptual links between law, sustainability, and ethics, emphasizing plural and inclusive frameworks for understanding environmental and social justice.

The study contributes to SDG 14 (Life Below Water) by enriching discourse on international legal and governance systems that support the conservation and sustainable use of ocean resources. It also aligns with SDG 16 (Peace, Justice and Strong Institutions) and SDG 17 (Partnerships for the Goals) by promoting equitable, transparent, and cooperative mechanisms for global environmental governance.

Article: “Genetic Engineering Contribution to Developing Cyanobacteria-Based Hydrogen Energy to Reduce Carbon Emissions and Establish a Hydrogen Economy”



Published as a peer-reviewed article by Gulzhanay K. Kamshybayeva, Bekzhan D. Kossalbayev, Asemgul K. Sadvakasova, Ardak B. Kakimova, Meruyert O. Bauenova, Suleyman I. Allakhverdiev, Bolatkhan K. Zayadan, Chi-Wei Lan, Saleh Alwasel, Tatsuya Tomo, and Jo-Shu Chang (EID: 2-s2.0-85147205683).

Authors are affiliated with Al-Farabi Kazakh National University (Kazakhstan); Satbayev University (Kazakhstan); Yuan Ze University (Taiwan); King Saud University (Saudi Arabia); Tokyo University of Science (Japan); Tunghai University – Department of Chemical & Materials Engineering and Research Center for Smart Sustainable Circular Economy (Taiwan); National Cheng Kung University (Taiwan); K.A. Timiryazev Institute of Plant Physiology, Russian Academy of Sciences (Russia); Institute of Basic Biological Problems, FRC PSCBR RAS (Russia); King Abdulaziz University (Saudi Arabia); and Bahçeşehir University – Faculty of Engineering and Natural Sciences (Türkiye).

This study explores genetic-engineering approaches to enhance photobiological hydrogen production in cyanobacteria and evaluates their role in building low-waste, cleaner energy systems. The research highlights pathways that reduce pollutant loads and integrate biological innovation into sustainable energy transitions.

The study contributes to SDG 14 (Life Below Water) by addressing pollution sources that ultimately impact aquatic environments and by linking technological progress with governance frameworks for the sustainable use of marine and freshwater resources. It also aligns with SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Action) by promoting renewable, low-carbon solutions that support environmental protection and the transition to a hydrogen-based economy.

Article: “Comparative in Silico and In Vitro Evaluation Toxic Effects of Bisphenol Derivatives in HepG2 Cells”



In 2024-2025 academic year, published as a peer-reviewed article by Aylin Balcı-Özyür, Anıl Yirün, Deniz Arca Çakır, İbrahim Özçelik, Merve Bacanlı, Gizem Özkemahlı, Suna Sabuncuoğlu, Nurşen Başaran, and Pınar Erkekoğlu (EID: 2-s2.0-85201557549).

Authors are affiliated with Hacettepe University, Faculty of Pharmacy, Department of Toxicology (Ankara, Türkiye); Bahçeşehir University, School of Pharmacy, Department of Toxicology (İstanbul, Türkiye); Çukurova University, Faculty of Pharmacy, Department of Toxicology (Adana, Türkiye); Hacettepe University, Vaccine Institute, Department of Vaccine Technology (Ankara, Türkiye); Erzincan Binali Yıldırım University, Faculty of Pharmacy, Department of Toxicology (Erzincan, Türkiye); and University of Health Sciences, Faculty of Pharmacy, Department of Toxicology (Ankara, Türkiye).

This study investigates the potential immunotoxic, apoptotic, and genotoxic effects of bisphenol derivatives (BPA, BPF, BPS) by combining in silico predictions with in vitro HepG2 assays. The integrated computational–experimental approach provides evidence on exposure risks and the environmental persistence of plastics-related chemicals.

The study contributes to SDG 14 (Life Below Water) by informing strategies to curb chemicals and microplastics that reach aquatic systems and threaten marine biodiversity. It also aligns with SDG 3 (Good Health and Well-being) and SDG 12 (Responsible Consumption and Production) by supporting safer material choices and reduced hazardous exposures.



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