Karunya INSTITUTE OF TECHNOLOGY AND SCIENCES
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SDG - 14 LIFE BELOW WATER

14.1 Research on life below water

Sl. No	Title	Authors	Year	Scopus Source title	Citations
1	Abundance, distribution and composition of microplastics in sediment and fish species from an Urban River of Bangladesh	Khan, M.B.| Urmy, S.Y.| Setu, S.| Kanta, A.H.| Gautam, S.| Eti, S.A.| Rahman, M.M.| Sultana, N.| Mahmud, S.| Baten, M.A.	2023	Science of the Total Environment	23
2	An inclusive trend study of evaluation and scientometric analysis of microplastics	Perumpully, S.J.| Kumar, R.P.| Gautam, S.| Ambade, B.| Gautam, A.S.	2023	Physics and Chemistry of the Earth	14
3	Impact of COVID-19 on Black Carbon and Carbon Monoxide Levels and Its Health Risk Assessment Over East India	Sankar, T.K.| Kumar, A.| Ambade, B.| Mahato, D.K.| Hussain, A.J.| Sethi, S.S.| Mohammad, F.| Soleiman, A.A.| Gautam, S.	2023	Aerosol Science and Engineering	3
4	Machine Learning Algorithm Review for the Detection of Formalin in Fish	Benny, A.| Emilin Renitta, R.| Anitha Mary, X.| Dutta, P.K.| Karthik, C.| El-Kenawy, E.-S.M.	2023	IET Conference Proceedings	1
5	Ocean Litter detection using Inception Transfer Learning Models	Sanjai, P.| Bonny, T.| Nasir, N.| AlShabi, M.| Al Shammaa, A.	2023	Proceedings of SPIE - The International Society for Optical Engineering	1
6	Marine Debris detection using Visual Geometry Group 19 and Residual Network 50	Sanjai, P.| Bonny, T.| Nasir, N.| AlShabi, M.| Al Shammaa, A.	2023	Proceedings of SPIE - The International Society for Optical Engineering	0
7	Regional air quality: biomass burning impacts of SO2 emissions on air quality in the Himalayan region of Uttarakhand, India	Gautam, A.S.| Kumar, S.| Gautam, S.| Singh, K.| Ram, K.| Singh, D.| Ambade, B.| Sharma, M.	2024	Air Quality, Atmosphere and Health	12
8	A sustainable solution for mitigating environmental corrosion in the construction sector and its socio-economic concern	Kanagaraj, B.| Priyanka, R.| Anand, N.| Kiran, T.| Andrushia, A.D.| Lubloy, E.	2024	Case Studies in Construction Materials	10

9	Ocimum sanctum as a Source of Quorum Sensing Inhibitors to Combat Antibiotic Resistance of Human and Aquaculture Pathogens	Issac Abraham, S.V.P.| Arumugam, V.R.| Mary, N.I.| Dharmadhas, J.S.| Sundararaj, R.| Devanesan, A.A.| Rajamanickam, R.| Veerapandian, R.| John Bosco, J.P.| Danaraj, J.	2024	Life	2
10	Fate of Micro/Nano Plastic Pollutants in the Marine Ecosystem	Thathapudi, J.J.| Gomez, L.A.| Vijay, V.| Chandrapragasam, V.| Shepherd, R.| Paul, S.| Lee, M.-J.| Somu, P.	2024	Remediation of Plastic and Microplastic Waste	0
11	Sustainable Solutions: Reviewing the Future of Textile Dye Contaminant Removal with Emerging Biological Treatments	Kusumlata| Ambade, B.| Kumar, A.| Gautam, S.	2024	Limnological Review	63
12	Rational construction of MOF derived α-Fe2O3/g-C3N4 composite for effective photocatalytic degradation of organic pollutants and electrocatalytic oxygen evolution reaction	Kumaravel, S.| Avula, B.| Chandrasatheesh, C.| Niyitanga, T.| Saranya, R.| Hasan, I.| Abisheik, T.| Rai, R.S.| Pandiyan, V.| Balu, K.	2024	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectrosco	38
13	IoT-Based Automatic Water Quality Monitoring System with Optimized Neural Network	Anoop, E.G.| Bala, G.J.	2024	Agronomy Journal	10
14	Multi-model exploration of groundwater quality and potential health risk assessment in Jajpur district, Eastern India	Sabinaya, S.| Mahanty, B.| Rout, P.R.| Raut, S.| Sahoo, S.K.| Jha, V.| Sahoo, N.K.	2024	Environmental Geochemistry and Health	8
15	Utilizing banana peduncle as an affordable bio-adsorbent for efficient removal of lead ions from water and industrial effluents	Muthusamy, P.| Murugan, S.| Mandal, S.K.| Mishra, B.| Mohanta, Y.K.| Sarma, H.| Narayan, M.	2024	Sustainable Chemistry for the Environment	4
16	Plant-based biopolymers for	Harshan, K.| Rajan, A.P.| Kingsley, D.|	2024	Physical Sciences Reviews	3

	wastewater pollutants mitigation	Sheikh, R.A.| Aashmi, J.| Rajan			
17	Advanced Weather Monitoring and Disaster Mitigation System	Paul, D.J.| Janani, S.P.| Ancy Jenifer, J.	2024	2024 International Conference on Cognitive Robotics and Intelligent Systems, ICC - ROBINS 2024	3
18	Fundamentals and applications of carbon nanotube-based carbocatalysts for water treatment	Kadarkarai, G.| Arumugam, A.| Subramanian, U.M.| Mohan, R.	2024	Woodhead Publishing Series in Composites Science and Engineering: Nanocomposites for Environmental, Energy, and Agricultural Applications	2
19	Adaptive Water Quality Potability Prediction and Analysis Through GEM Continual Learning Algorithm for Sustainable Resource Management	Jeremy David, C.| Shibin, D.	2024	10th International Conference on Advanced Computing and Communication Systems, ICACCS 2024	1
20	Evaluation of toxicity in real-time textile effluents post-treatment using Sorghum bicolor and Danio rerio-Potential for reuse	David, J.J.| Maria Stephen, A.M.| Sebastian, S.L.| Krishnan, S.K.| Kavitha, S.| Kalivel, P.| Palanichamy, J.	2024	Desalination and Water Treatment	1
21	Exploring chitosan nanocomposites for wastewater treatment via solid phase extraction biorefinery	Gowri Lakshmi, S.| Gomez, L.A.| Shepherd, R.| Chandrapragasam, V.| Vijay, V.| Thathapudi, J.J.	2024	Bio Refinery of Wastewater Treatment: Way to Generate Waste to Va	1
22	Avenues and opportunities of detoxification of micropollutants from industrial effluent using advanced biological treatment techniques	Avenues and opportunities of detoxification of micropollutants from industrial effluent using advanced biological treatment techniques	2024	Emerging Innovative Trends in the Application of Biological Processes for Industrial Wastewater Treatment	1
23	An Investigation on the Treatment of Wastewater Disperse Dye by Electrocoagulation and Examine the Use	Asath Murphy, M.S.| Jovitha, J.D.| Robin, R.S.| Sahaya, L.S.| Palanichamy, J.| Parameswari, K.	2024	Iranian Journal of Chemistry and Chemical Engineering	0

	of the Treated Dye for Flora and Fauna				
24	Monsoon Shifts and Their Impact on Air Quality and Weather: A Case Study of the Amaravathi River Basin, India	Aerosol Optical Depth and Precipitation: Measuring Particle Concentration, Health Risks and Environmental Impacts	2024	Aerosol Optical Depth and Precipitation: Measuring Particle Concentration, Health Risks and Environmental Impacts	0
25	Variability of ground water quality in quaternary aquifers of the cauvery and vennar sub-basins within the Cauvery Delta, Southern India	Kokkat, A.| Mondal, N.C.| SajilKumar, P.J.| James, E.J.	2024	Sustainability of Natural Resources: Planning, Development, and Management	0
26	IoT Based Water body & Canal Management system using Cloud Technology	Shyaam Sankar, M.| Janani, S.P.| Ancy Jenifer, J.| Stewart Kirubakaran, S.	2024	Proceedings - 2024 4th International Conference on Pervasive Computing and Social Networking, ICPCSN 2024	0
27	A study on the assessment of pollution and strategies for rejuvenation of Bharathapuzha river in Kerala, India	Anto, C.A.| Verghese, V.| Kurian, P.K.| Cyriac, M.G.| Archana, S.	2024	International Journal of Water	0
28	Microbial immobilization as an adept bioremediation tool for dye degradation	Krishnan, S.K.| Subbiah, K.| Subramanian, K.| Kandasamy, S.	2024	Emerging Innovative Trends in the Application of Biological Processes for Industrial Wastewater Treatment	0
29	Dynamic change analysis of water spread region and its impact assessment using spectral indices of remotely sensed data	Anand, B.| Rekha, R.S.| Remitha, K.R.| Maniyammai, V.| Ramaswamy, K.| Gautam, S.	2024	Environment, Development and Sustainability	7
30	Application of artificial intelligence tools in wastewater and waste gas treatment systems: Recent advances and prospects	Behera, S.K.| Karthika, S.| Mahanty, B.| Meher, S.K.| Zafar, M.| Baskaran, D.| Rajamanickam, R.| Das, R.| Pakshirajan, K.| Bilyaminu, A.M.| Rene, E.R.	2024	Journal of Environmental Management	12

31	Comprehensive assessment of microalgal-based treatment processes for dairy wastewater	Singh, P.| Mohanty, S.S.| Mohanty, K.	2024	Frontiers in Bioengineering and Biotechnology	11
32	Temporal dynamics of urban air pollutants and their correlation with associated meteorological parameters: an investigation in northern Indian cities	Soni, P.S.| Singh, V.| Gautam, A.S.| Singh, K.| Sharma, M.| Singh, R.| Gautam, A.| Singh, S.P.| Kumar, S.| Gautam, S.	2024	Environmental Monitoring and Assessment	7
33	Plant-based biopolymers for wastewater pollutants mitigation	Harshan, K.| Rajan, A.P.| Kingsley, D.| Sheikh, R.A.| Aashmi, J.| Rajan, A.P.	2024	Physical Sciences Reviews	3
34	Reuse and Recovery of Water from Industrial Textile Dyeing Effluent Using High-Performance Electrodes Continuous Flow Electrocoagulation Reactor	Jegathambal, P.| Brunoc| Shobina| Mayilswamy, C.| Parameswari, K.	2024	Nature Environment and Pollution Technology	2
35	Assessing titanium vs. aluminium electrodes for wastewater remediation in the small-scale industries (SSI) textile sector	Sebastian, S.L.| Kalivel, P.| Subbiah, K.| Murphy, M.S.A.| David, J.J.| Palanichamy, J.	2024	Environmental Nanotechnology, Monitoring and Management	1
36	Exploring chitosan nanocomposites for wastewater treatment via solid phase extraction biorefinery	Gowri Lakshmi, S.| Gomez, L.A.| Shepherd, R.| Chandrapragasam, V.| Vijay, V.| Thathapudi, J.J.	2024	Bio Refinery of Wastewater Treatment: Way to Generate Waste to Value	1
37	Microplastics Detection in Soil and Water: Leveraging IoT Technologies for Environmental Sustainability	Johnpaul, J.B.| Thusnavis Bella Marry, I.| Thomas, P.| Rithika, S.| Vishalakshi| Mercy, M.	2024	International Conference on Computing and Intelligent Reality Technologies, Proceedings of ICCIRT 2024	0
38	Ecology and diversity of microbial communities involved in the removal of priority contaminants and micropollutants in wastewater treatment systems	Shepherd, R.| Vijay, V.| Nair, A.| Rai, R.S.| Chandrapragasam, V.| Gomez, L.A.| Thathapudi, J.J.	2024	Trends in Biological Processes in Industrial Wastewater Treatment	0

39	Monsoon Shifts and Their Impact on Air Quality and Weather: A Case Study of the Amaravathi River Basin, India	Kumar, R.P.| Brema, J.| Gautam, S.| Catherina, G.	2024	Aerosol Optical Depth and Precipitation: Measuring Particle Concentration, Health Risks and Environmental Impacts	0

14.2 Supporting Aquatic Ecosystems through Education

14.2.1. Nature Walk from Karunya to Sadivayal (Environmental Awareness Initiative)

In an inspiring environmental awareness initiative, students and faculty members from Karunya Institute of Technology and Sciences organized a nature walk from the Karunya campus to Sadivayal, Coimbatore. The activity aimed to foster a deeper connection with nature, promote environmental consciousness, and encourage sustainable practices among participants.

The trail from Karunya to Sadivayal meanders through lush greenery, agricultural fields, forest stretches, and small village settlements, offering participants an immersive experience in the region's natural beauty. As the group proceeded along the path, they observed the diverse flora and fauna native to the Western Ghats foothills, while the melodious chirping of birds and the rustling of leaves added to the serene atmosphere.

Throughout the walk, participants reflected on the importance of preserving the ecosystem and maintaining environmental balance. The initiative also provided a platform for informal discussions on biodiversity conservation, pollution control, and sustainable land use practices. As the walk concluded at Sadivayal, participants took a moment to appreciate the tranquil landscape and rural charm of the area. The experience left everyone rejuvenated, instilling a sense of responsibility toward protecting and nurturing the natural environment.

Nature Walk from Karunya to Sadivayal served as a meaningful educational and recreational activity, blending physical well-being with ecological awareness. This initiative highlights Karunya's ongoing commitment to environmental stewardship and experiential learning through community and nature-based programs.

14.2.2. Community Outreach Visit to Mundanthurai Government School and Vellapathy Tribal Village

As part of the ongoing community engagement under the environmental sustainability initiatives, a visit was organized to Mundanthurai Government School and Vellapathy Tribal Village to assess local water management and sanitation challenges.

During the visit to Mundanthurai Government School, discussions with the Head Master revealed that a water treatment (RO) plant, procured through the MLA fund, had been installed but remained non-functional due to the absence of an operational electrical connection. The school administration requested institutional assistance in facilitating the installation and activation of the RO unit to ensure safe drinking water for students and staff.

Subsequently, the team visited Vellapathy Tribal Village, where it was observed that the stream adjacent to the village, serving as the primary source of drinking water, had been contaminated by wastewater discharge from the TWAD system. The villagers expressed concern regarding the deteriorating water quality, which poses a direct threat to both human health and aquatic ecosystems.

Additionally, a solar panel system, also provided through the MLA fund to power a water motor, was found to be non-operational. The community requested technical support to restore the solar panels for effective water pumping and sustainable energy use.

This outreach initiative aligns with Sustainable Development Goal 14 – Life Below Water, as it focuses on protecting freshwater and downstream aquatic environments from contamination, promoting water sustainability, and encouraging renewable energy utilization in rural communities. The visit underscored the importance of collaborative problem-solving between academic institutions and local communities to achieve clean water access and ecological preservation.

14.3 Supporting aquatic ecosystems through action

14.3.1. Upcycling Crafts from Waste

As part of its ongoing environmental awareness initiatives, the Nature Club of Karunya Institute of Technology and Sciences organized an innovative activity focused on creating useful crafts from discarded materials. The primary objective of this program was to encourage students to explore creative reuse through upcycling, thereby reducing the volume of waste that ultimately pollutes land and water bodies.

Club members were encouraged to collect waste materials such as plastic bottles, old newspapers, cardboard boxes, and tin cans. Using these items, they designed and crafted a variety of eco-friendly products including bird feeders, photo frames, and pencil holders. This hands-on activity not only promoted creativity and teamwork but also reinforced the importance of minimizing plastic and paper waste through sustainable practices.



By transforming waste into valuable craft items, participants learned how small individual efforts contribute to larger environmental goals. The initiative directly supports Sustainable Development Goal 14 – Life Below Water, by reducing potential plastic leakage into aquatic systems and raising awareness about the importance of protecting marine and freshwater ecosystems from pollution.

In conclusion, the waste-to-art initiative by the Nature Club exemplifies how educational institutions can integrate environmental education with practical sustainability efforts. Through upcycling and responsible waste management, the program nurtures ecological consciousness among students and fosters a culture of respect toward both terrestrial and aquatic environments.

14.3.2. Training on Modern Farming Practices

A training program on Modern Farming Practices was organized by the Division of CCAC in collaboration with the Karunya School of Agricultural Sciences to promote environmentally responsible agricultural methods that safeguard aquatic and terrestrial ecosystems. Farmers from Mathvarayapuram, Vellapathy, and Porethy villages participated in the session, which also included an exposure visit to the Karunya North Farm.

The session highlighted the adoption of precision farming, automation, and organic practices to enhance crop productivity while minimizing water pollution. Participants learned how the use of controlled irrigation, biofertilizers, and integrated pest management reduces fertilizer runoff and chemical contamination of nearby water bodies, thereby protecting aquatic life. Hands-on demonstrations at the farm introduced farmers to sustainable livestock practices, including poultry and goat farming, emphasizing nutrient recycling and waste management. These techniques promote a closed-loop system that minimizes environmental degradation.

By fostering sustainable agriculture and pollution control, this initiative directly supports Sustainable Development Goal 14 – Life Below Water, by reducing agricultural pollutants entering aquatic systems and maintaining ecosystem health. The program concluded with an

interactive discussion and community lunch, reinforcing the collective responsibility toward environmental stewardship and rural sustainability.

14.3.3. Water for Peace" – World Water Day Celebration

The Rotaract Club of Karunya University organized the event "Water for Peace" in observance of World Water Day, bringing together club members on an open ground to form a powerful visual representation of water droplets. This symbolic gesture aimed to emphasize the significance of water conservation and the responsible use of this vital resource. Participants united to reaffirm their commitment to protecting and preserving water for the well-being of the planet. As part of the initiative, eco-friendly handcrafted pen stands were distributed to participants, reinforcing the message of sustainability and mindful consumption. Additionally, members expressed their understanding of water conservation through creative artworks and drawings, showcasing their reflections on the theme.

The event served as a poignant reminder of our shared responsibility in safeguarding water resources for current and future generations. It echoed the core objectives of SDG 6 (Clean Water and Sanitation) and SDG 14 (Life Below Water) by promoting awareness and collective action toward water preservation, peace, and environmental harmony.

14.3.4. “Green Bags” – Promoting Eco-Friendly Alternatives

The Rotaract Club of Karunya University organized an engaging event titled “Green Bags” with the primary objective of raising awareness about the importance of adopting paper bags as an eco-friendly alternative to plastic.

The initiative emphasized sustainable living by encouraging the reduction of plastic usage, thereby mitigating environmental pollution. Club members enthusiastically participated in a hands-on workshop where they used newspapers and cellophane tapes to craft paper bags. Guided by live demonstrations, participants showcased their creativity and craftsmanship, producing functional and aesthetically pleasing bags.

The event effectively promoted awareness on the harmful effects of plastic pollution and highlighted the importance of simple lifestyle changes in protecting the environment. By advocating for sustainable consumption, “Green Bags” supported the goals of SDG 12 (Responsible Consumption and Production) and SDG 14 (Life Below Water), fostering an environmentally conscious community within the campus.

14.4. Mitigation of Water Contamination and Safeguarding Marine Ecosystem

14.4.1. Waste Paper Recycling Using Hydra Pulper Mixer Dryer

Waste paper recycling stands as a cornerstone of sustainable waste management, providing an effective means to convert discarded paper into reusable resources. The integration of advanced technologies such as the Hydra Pulper Mixer Dryer enhances this recycling process by improving operational efficiency and sustainability. Through this system, waste paper is efficiently transformed into high-quality pulp, contributing to environmental protection and reduced waste generation.

Hydra Pulper Mixer Dryer

The Hydra Pulper Mixer Dryer is a state-of-the-art machinery system engineered to facilitate the breakdown and processing of waste paper in an eco-efficient manner. It utilizes hydraulic pulping, mechanical mixing, and precision drying techniques to convert paper waste into pulp suitable for reuse in various applications.

Hydraulic Pulping: Waste paper is fed into the Hydra Pulper Mixer Dryer, where high-pressure water jets disintegrate paper fibers and separate them from impurities such as ink, glue, and coatings.

Mixing: The pulped fibers are thoroughly blended to ensure homogeneity and purity, resulting in a refined pulp product free from contaminants.

Drying: The pulp is then subjected to control drying processes, effectively reducing its moisture content and producing a dry, usable pulp ready for paper manufacturing or other industrial applications.

Benefits:

Efficiency: The Hydra Pulper Mixer Dryer streamlines the recycling process, significantly reducing processing time and energy consumption.

Quality Output: Its integrated mixing and pulping mechanisms ensure a high-grade pulp product suitable for diverse end uses.

Resource Conservation: By recycling paper waste, the system minimizes the demand for virgin pulp, thereby conserving forests and reducing water pollution caused by paper industry effluents.

Cost-Effectiveness: Onsite pulp generation lowers production costs, waste disposal expenses, and the environmental footprint of paper manufacturing.

This recycling initiative contributes to Sustainable Development Goal 14 by preventing paper waste from entering aquatic systems, thus mitigating water contamination and safeguarding marine biodiversity. Through resource recovery and pollution reduction, the Hydra Pulper Mixer Dryer promotes a circular economy approach that aligns with global sustainability objectives.

14.5. Mitigation of Water Contamination and Safeguarding Agriculture and groundwater

14.5.1. Expert Talk on Modern Agriculture and Sustainable Development (Supporting SDGs)

An expert talk was organized to enhance students' understanding of modern agricultural practices and the importance of Sustainable Development Goals (SDGs). The event featured two distinguished speakers — Dr. P. Ranchana, who shared insights on Horticulture Techniques, and Dr. T. V. Ranganathan, who addressed the role of SDGs in achieving environmental and social sustainability.

Topic 1: Horticulture Techniques Dr. P. Ranchana, an expert in sustainable crop production, emphasized the integration of traditional knowledge with modern horticultural innovations to ensure food security and ecological balance. Her talk covered scientific methods of plant propagation, intercropping, organic inputs, integrated pest management, and climate-smart horticulture.

She highlighted the role of horticulture in improving nutrition, income generation, and environmental resilience. By encouraging students to adopt sustainable cultivation methods and home-based gardens, her session promoted responsible production practices aligned with

SDG 2 (Zero Hunger), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action).

Topic 2: Sustainable Development Goals (SDGs) Dr. T. V. Ranganathan, a sustainability consultant and policy advocate, delivered an insightful session on the 17 United Nations SDGs, emphasizing their interconnection and collective impact. He illustrated how achieving goals such as **Clean Water and Sanitation (SDG 6), Life Below Water (SDG 14), and Life on Land (SDG 15)** directly supports global ecological stability. Through real-world examples of renewable energy use, waste recycling, and community-driven initiatives, he inspired students to become active change-makers in sustainability.

The expert talk encouraged participants to translate awareness into action by integrating SDG principles into academic projects and community service. The sessions collectively reinforced Karunya's vision of nurturing environmentally conscious individuals committed to sustainable growth and planetary well-being.