

Report on

SDG 14: Life Below Water

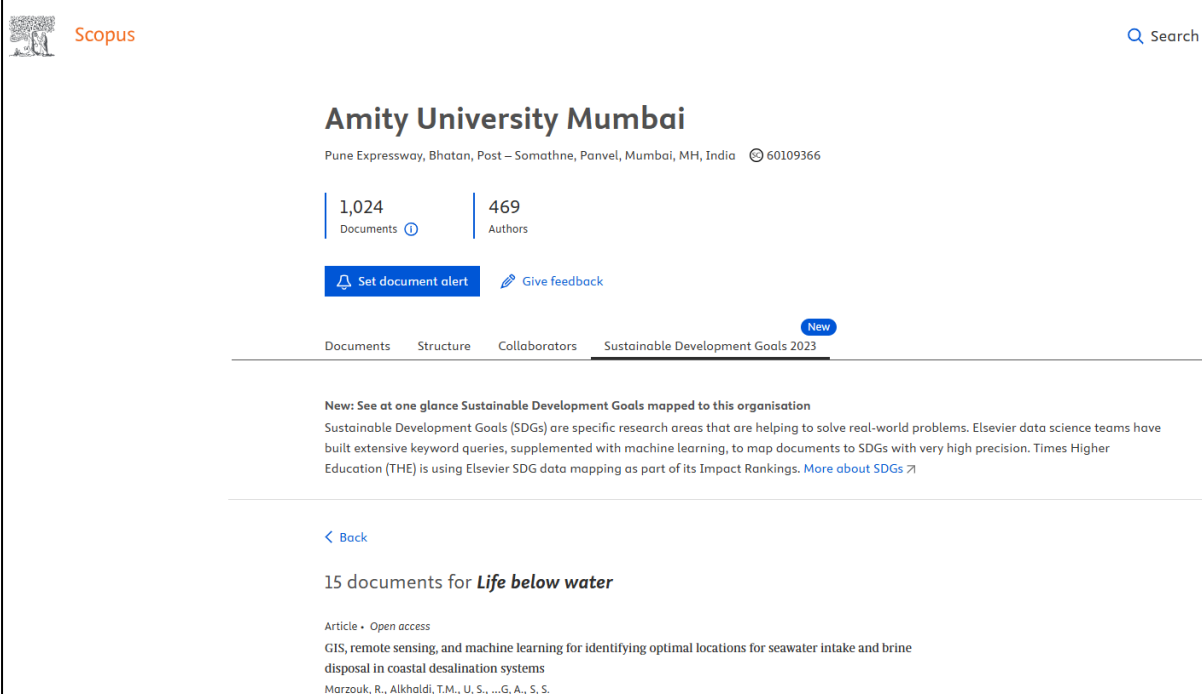


Table of Contents

SDG 14: Life Below Water	3
Publication in Scopus for SDG 14: life Below Water	3
Improving the feasibility of aquaculture feed by using microalgae	3
Overtourism Perceptions of Institutional Stakeholders on Alibag: A Regenerative Solution	4
Responses of natural plastisphere community and zooplankton to microplastic pollution: a review on novel remediation strategies	5
GIS, remote sensing, and machine learning for identifying optimal locations for seawater intake and brine disposal in coastal desalination systems	6
Nanofiltration applications for potable water, treatment, and reuse	7

SDG 14: Life Below Water

Publication in Scopus for SDG 14: life Below Water



The screenshot shows the Scopus profile for Amity University Mumbai. It displays 1,024 documents and 469 authors. The profile is categorized under Sustainable Development Goals 2023. A new feature highlights that the organization's research is mapped to specific SDGs. A list of 15 documents for 'Life below water' is shown, with the first article titled 'GIS, remote sensing, and machine learning for identifying optimal locations for seawater intake and brine disposal in coastal desalination systems' by Marzouk, R., Alkhalidi, T.M., U. S., ...G. A., S. S.

The publications are in the reputed journals Sustainable Industrial Wastewater Treatment and Pollution Control, Marine Biology Research, Marine Pollution Bulletin, **Marine Biology Research** and Solutions for Managing Overtourism in Popular Destinations.

Phycoremediation Processes in Industrial Wastewater Treatment, Environmental Research, Environmental Science and Pollution Research.

Improving the feasibility of aquaculture feed by using microalgae

The aquaculture industry is an efficient edible protein producer and grows faster than any other food sector. Therefore, it requires enormous amounts of fish feed. Fish feed directly affects the quality of produced fish, potential health benefits, and cost. Fish meal (FM), fish oil (FO), and plant-based supplements, predominantly used in fish feed, face challenges of low availability, low nutritional value, and high cost. The cost associated with aquaculture feed represents 40–75% of aquaculture production cost and one of the key market drivers for the thriving aquaculture industry.

Microalgae are a primary producer in aquatic food chains. Microalgae are expanding continuously in renewable energy, pharmaceutical pigment, wastewater treatment, food, and feed industries. Major components of microalgal biomass are proteins with essential amino acids, lipids with polyunsaturated fatty acids (PUFA), carbohydrates, pigments, and other bioactive compounds. Thus, microalgae can be used as an essential, viable, and alternative feed ingredient in aquaculture feed. In recent times, live algae culture, whole algae, and lipid-extracted algae (LEA) have been tested in fish feed for growth, physiological activity, and nutritional value. The present review discusses the potential application of microalgae in aquaculture feed, its mode of application, nutritional value, and possible replacement of conventional feed ingredients, and disadvantages of plant-based feed. The review also focuses on integrated processes such as algae cultivation in aquaculture wastewater, aquaponics systems, challenges, and future prospects of using microalgae in the aquafeed industry. © 2021, The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

Overtourism Perceptions of Institutional Stakeholders on Alibag: A Regenerative Solution

Overtourism strains Alibaug's coastal habitats. Weekend congestion overflows local trash collection, polluting plastic and marine debris. Illegal coastal development and unregulated coastal water sports destroy the ecosystem. Urbanization, tar ball contamination, and oil spills damage these vulnerable ecosystems. These challenges are addressed by this pilot research of six institutional stakeholders, including government officials and activists. Stakeholder concerns included unmanaged garbage, disaster management, and safety. Overtourism threatens Alibaug's sustainability despite BEAG clean-ups. Regenerative tourism encourages environmental protection, community-led mangrove restoration, and waste management. Sustainable tourism strategies balance environmental restoration and economic rewards. The findings demonstrate the need for a comprehensive response to overtourism in Alibaug and provide a model for other Indian coastal communities.

Responses of natural plastisphere community and zooplankton to microplastic pollution: a review on novel remediation strategies

The ubiquitous presence of microplastics (MP) in different environments has been well documented. Microplastic contamination has rapidly become a serious environmental issue, threatening marine ecosystems and human health. MP has been reported to accumulate organic pollutants associated with various microbial communities. The MP hazard is specifically serious in urban lakes, near-shore beaches, and benthic sediments. To prevent the further spread of MP and mitigate the increasing level of MP contamination, along with its associated environmental and economic concerns, it is essential to address mitigation strategies and their negative impacts. Contributed by low degradability, hydrophobicity, and sorption potential, the plastic surface acts as an important substrate colonized by several microorganisms known as the plastisphere community. Adaptive responses of the plastisphere community, MP ingestion, and surface modifications by the zooplankton provide insight into novel remediation strategies based on integrated natural community-level approaches. Zooplankton studies are extensive and encompass assessments of their abundance, biomass, distribution, and DNA meta-barcoding. Additionally, zooplankton has been utilized as an indicator in various freshwater environmental policies. Overall, employing zooplankton as an indicator in environmental policies is a vital tool for assessing the health of aquatic ecosystems and can assist in guiding management and conservation efforts. This review summarizes (i) the current literature on the estimation of MP distribution in aquatic environments, (ii) the effects of MP accumulation on the environment and its inhabitants, i.e., the interactions with marine microbiota, (iii) addresses the bioremediation strategies with an emphasis on microbial degradation, ecological functioning and adaptive responses of marine microbes and finally, (iv) the directions of further research aiming to in situ mitigation of MP pollution. Recent advancements have focused on innovative methods such as membrane bioreactors, synthetic biology, organosilane-based techniques, biofilm-mediated remediation, and nanomaterial-enabled strategies. Nano-enabled technologies show substantial potential to enhance microplastic removal efficiency. Further investigation is necessary to develop advanced treatment technologies that can enhance the removal

efficiency of microplastics (MPs) in drinking water. Additionally, more research is needed to understand the toxic impacts of MPs on marine ecosystems, including coral reefs, seagrass beds, mangroves, and other important habitats. © The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2025.

GIS, remote sensing, and machine learning for identifying optimal locations for seawater intake and brine disposal in coastal desalination systems

The rising global demand for freshwater has made seawater desalination vital, especially in coastal areas like Bhimunipatnam, Andhra Pradesh, India. Improper placement of intake and brine discharge sites can lead to environmental damage and inefficiencies. This study introduces an integrated framework using Geographic Information Systems (GIS), Remote Sensing (RS), and Machine Learning (ML) to identify optimal desalination sites. Key environmental and technical factors—such as bathymetry, land use, ocean current velocity, slope, proximity to sensitive ecosystems, and geomorphology—were analyzed through geospatial datasets. A Random Forest (RF) model was used for predictive site suitability, while the Analytical Hierarchy Process (AHP) guided factor weighting within a Multi-Criteria Decision Analysis (MCDA). The resulting Suitability Index (SI) categorized areas from Very Low to Very High suitability. Over 50 % of the region fell into High to Very High suitability zones. Field validation showed over 85 % prediction accuracy. The approach offers a scalable, reliable method to balance environmental sustainability with technical feasibility, providing actionable insights for decision-makers. This model can be adapted for other coastal regions facing freshwater challenges, supporting long-term water security and coastal resilience.

Nanofiltration applications for potable water, treatment, and reuse

With increasing population and the advent of industrialisation, available means of potable water has become more polluted which demands for more advanced techniques of water treatment. In this context, nanofiltration (NF) is one of the most promising techniques replacing reverse osmosis (RO) and ultrafiltration; while RO membranes predominate the saltwater desalination sector, NF membranes are used to selectively remove ions and organic compounds in a number of water and wastewater treatment and industrial applications. The applications of nanofiltration have been extended to other industries such as milk and drink industries as well as pharmaceuticals and much more. The goal of this chapter is to describe how NF membranes are used in the water and wastewater treatment, involving water softening, colour removal, disinfection by-products, seasonal fouling, and heavy metal removal. Additionally, focus will also be on the advantages of NF technique as compared to others related to cost, use of chemicals, increase organic matter removal, etc.