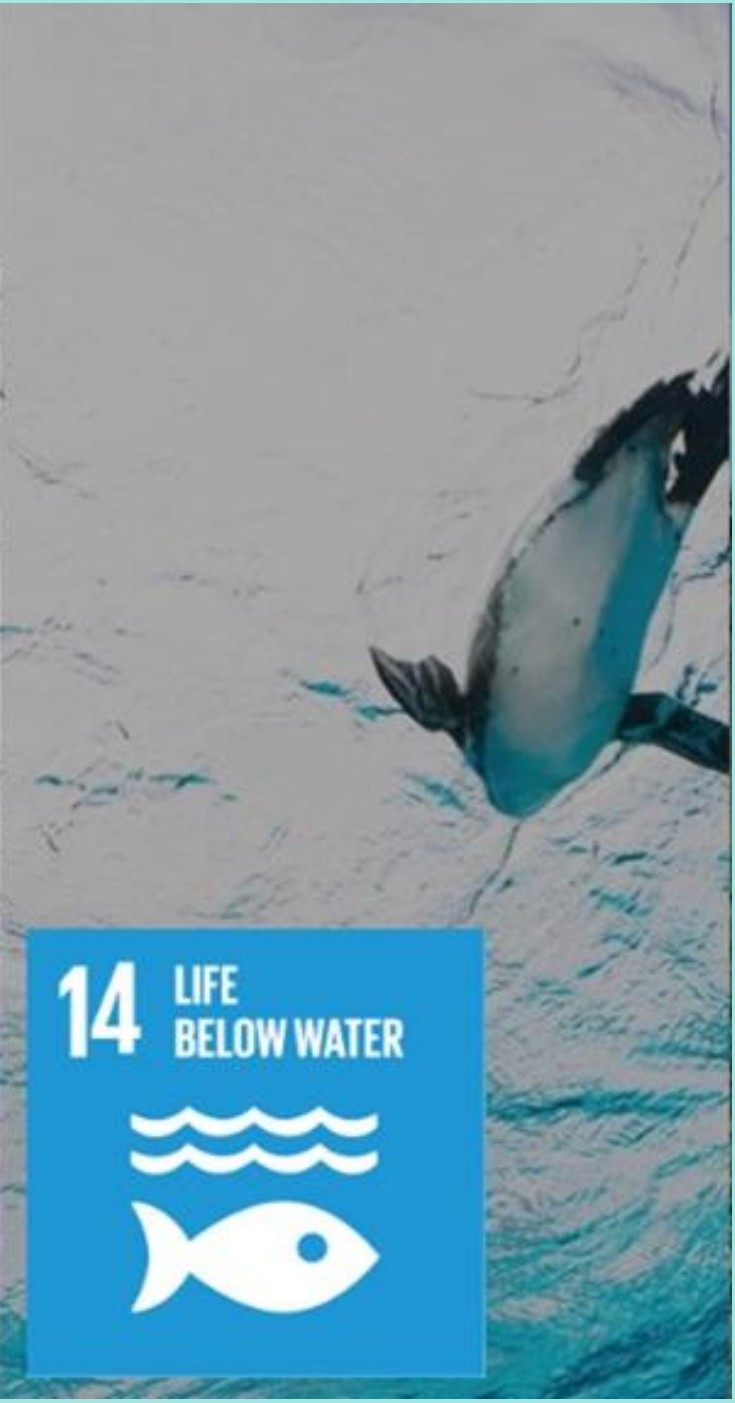

BRAINWAR UNIVERSITY

Annual SDG-14 Report
2023-24

SDG 14: Life Below Water

Conserving Aquatic Ecosystems and Advancing Sustainable Water Research

SDG 14: Life Below Water – *Conserving Aquatic Ecosystems and Advancing Sustainable Water Research*

About SDG 14

The United Nations' Sustainable Development Goal 14: Life Below Water aims to conserve and sustainably use the oceans, seas, and marine resources. While Brainware University is an inland institution, its scientific and community initiatives address the broader aquatic ecosystem — rivers, lakes, ponds, and groundwater — all vital to sustaining biodiversity and human life.

In West Bengal, where riverine systems and wetlands support livelihoods and biodiversity, Brainware University's approach focuses on freshwater conservation, pollution control, and sustainable water management through research, innovation, and education.

Institutional Framework and Policy Orientation

Under its Environmental Sustainability and Water Management Policy (2023), the University promotes water conservation, aquatic biodiversity education, and innovation in pollution mitigation technologies.

The policy aligns with SDG 6 (Clean Water and Sanitation) and SDG 14 by embedding water literacy in both academic and outreach activities.

Focus Area	University Initiative
Water Conservation	Rainwater harvesting and greywater reuse across hostels and laboratories
Pollution Mitigation	Lab-based wastewater pre-treatment before disposal
Awareness and Education	NSS/Clubs conducting awareness sessions.
Research and Innovation	AI-enabled monitoring and bioremediation studies

Research and Innovation for Aquatic Sustainability

Brainware University promotes R&D that directly contributes to aquatic sustainability through AI, biotechnology, and environmental science.

A. Patents and Innovations (2023–24)

Title / Technology	Inventors / Department	Relevance to SDG 14
An Automating Water Quality Assessment System Using IoT-Enabled Drone	Soma Mitra et al., CSS	Monitors pollutants in rivers and ponds using drones
Sustainable Indoor Air Quality Improvement Using Aqua Algae-Based Filtration Systems	Priyanka Sen Guha et al., Biotechnology	Utilizes algae species for bioremediation and oxygen enrichment
Production of Potassium Nanoparticles from Coriandrum sativum – A Potent Nano-Biofertilizer	Nirlipta Saha et al., Biotechnology	Reduces chemical runoff into aquatic systems
Revolutionizing Hygiene with Bamboo-Sheathed Portable Toilet with Antimicrobial Properties	Paramita Ghosh et al., Biotechnology	Minimizes contamination of natural water bodies
Design and Development of Smart Soil Moisture and Watering System for Agriculture	Debojyoti Bhuinya et al., CSE	Conserves irrigation water and prevents overuse in farmlands

B. Research Publications and Book Chapters

Title	Authors / School	Publisher / ISBN	Relevance
Bacterial Secondary Metabolites	Soumik Mukherjee et al. (Agriculture)	Elsevier, 978-0-323-95251-4	Studies bioproducts for controlling aquatic microbial pollution
Crop Sustainability and Intellectual Property Rights	P. Mukherjee, R. Dasgupta (Law)	Taylor & Francis	Links legal protection with sustainable agri-water use
Sustainable Smart Manufacturing in Industry 4.0	A. Prasad et al. (AHS)	CRC Press	Discusses resource efficiency and clean production impacting water cycles

Environmental Evolution – The Process of Ecological Changes in India	S. Adhikary & D. Sasmal (Law)	ISBN 978-81-970323-7-0	Evaluates ecological restoration of riverine systems in India

MoUs and Collaborations Relevant to SDG 14

Partner / Organisation	Type	Nature of Collaboration
Redivivus Recyclers Pvt. Ltd.	Waste Management Industry	Waste segregation and recycling for water conservation
Eco Fast Agri Solutions Pvt. Ltd.	Agri Industry	Sustainable irrigation and biofertilizer research
ICAR–NINFET	National Institute	Research on natural fiber engineering and water efficiency
Centre for Public Health Research	Academic Partner	Waterborne disease prevention and quality surveillance
Hridaypur Srija (NGO)	Community Partner	CSR projects on wetland cleanup and water literacy
IIT Kharagpur – Virtual Labs	Academic Partner	Virtual simulations of water resource engineering

Campus and Community Action

A. Water Conservation on Campus

- Rainwater Harvesting: Installed at four major buildings.
- Reuse Systems: Greywater from hostels redirected for landscape irrigation.
- Low-Flow Fixtures: Adopted in 80% of campus washrooms.
- Water Audit (2023): Conducted by Environmental Science Department — per capita consumption reduced from 38 L/day to 30 L/day.

B. Community and NSS Engagement

Activity	Date	Partner
World Water Day Seminar	22 March 2024	NSS Unit & Dept. of AHS
Adopt-a-Pond Initiative	August 2023	Hridaypur Srija
Plastic-Free Wetlands Drive	November 2023	Local panchayat & NSS
Water Testing Camp	February 2024	ICAR-NINFET

Academic and Student-Led Projects

Project Title	Objective
AI-Powered River Monitoring System	To detect water pollution via live drone data
Biosand Filter for Low-Cost Water Purification	Designed for rural households
Smart Irrigation Using IoT Sensors	Reduce irrigation wastage and soil salinity
Microplastic Study in Kolkata Canals	Assess urban pollution in freshwater

Integration in Curriculum and Capacity Building

Brainware University integrates water and marine sustainability into academics and training through:

- B.Sc. Environmental Science: Course on *Aquatic Ecology and Pollution*.
- Biotechnology: *Water Microbiology and Biofiltration Technologies.*
- Agriculture: *Irrigation Engineering and Water Management.*
- Civil Engineering: *Hydrology, Drainage, and Sustainable Water Systems.*
- Open Elective (2024): *AI in Environmental and Aquatic Data Analytics.*

Students also attend workshops hosted jointly with INTA (Argentina) and Kasama University (Zambia) on global water security and aquatic ecosystem management.

Outcomes and Global Linkages

Brainware's contribution to SDG 14 aligns with:

- India's National Water Mission (NWM) – efficient use of water and reuse of wastewater.

Through research, campus innovation, and partnerships, Brainware's model strengthens both technological and behavioral solutions to safeguard aquatic ecosystems.

Brainware University's SDG 14 journey demonstrates how an inland institution can meaningfully advance "Life Below Water."

By integrating science, innovation, and social outreach, the University not only preserves local aquatic systems but also builds a replicable framework for sustainable water governance. Its cross-disciplinary efforts—from AI-driven monitoring to bio-based filtration—reflect a clear commitment to making every drop count for the planet's shared future.

-- End of report --