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Sustainable Development Goal 6: Clean Water and Sanitation

This report documents Brainware University's institutional initiatives, projects, and outcomes aligned with **Sustainable Development Goal 6 (Clean Water and Sanitation)** during the **academic year 2024–25**.

It captures how the university integrates research, education, outreach, and innovation to ensure **safe water access, efficient sanitation practices, and ecosystem protection** within and beyond the campus.

Brainware's strategy links technology and community engagement. While researchers develop low-cost filtration and monitoring systems, student-led programmes through **NSS** and **Unnat Bharat Abhiyan (UBA)** spread hygiene and clean water awareness in adopted villages. Together, they translate SDG 6 from a global vision into measurable local impact.

Context and Institutional Relevance

Access to clean water and sanitation remains one of India's central developmental challenges. In West Bengal, over 30% of rural households still depend on untreated groundwater. Located in Barasat, North 24 Parganas—an area affected by groundwater contamination—Brainware University recognizes its ethical and academic duty to advance solutions through research and action.

The university's **Strategic Plan (2023–2028)** identifies *sustainability, environment, and community well-being* as cross-cutting institutional priorities. In alignment with **Target 6.1 (safe drinking water)** and **Target 6.3 (reducing pollution)**, Brainware integrates environmental sustainability into education, governance, and technology.

Policy Commitment and Governance Structure

To institutionalize SDG 6, Brainware University has established a **Green Campus and SDG Monitoring Committee** under the Dean (Research & Projects). This committee ensures:

- regular water testing and sanitation audits on campus,
- integration of environmental science modules across curricula,
- documentation of outreach and rural impact under NSS and UBA, and
- policy feedback into administrative and infrastructure planning.

The university also maintains a **Zero-Waste Campus Policy (2023)** promoting rainwater harvesting, wastewater reuse, and single-use plastic elimination.

Government-Funded Projects on Water Quality and Sanitation: Government grants remain the backbone of Brainware's SDG 6 research portfolio.

Ongoing Projects (2024–25):

Principal Investigator	Department	Title	Funding Agency

Dr. Shouvik Saha	Biotechnology	Surveillance of Water Quality and Microbial Diversity of Wetland Pisciculture in N. & S. 24 Parganas	DSTBT, Govt. of West Bengal
Prof. Deepshikha Datta, Dr. Anuradha Palta, Dr. Sourav Das	Chemistry & Psychology	Assessment of Groundwater Quality and Prototype Development of a Multimedia Integrated Copper-Based Earthen Filter (Faldi Village)	West Bengal Pollution Control Board
Ms. Piyali Khamkat	Pharmaceutical Technology	Nonwoven Fabric Composite Hydrogel Wound Dressing from *Centella asiatica* – A Water-Based Sustainable Polymer Model	MoEFCC

These projects focus on **low-cost purification**, **safe sanitation systems**, and **antibiotic resistance control in aquatic environments**. Together, they enhance water safety research and community resilience.

University-Funded (Seed Grant) Projects Supporting SDG 6: Brainware's internal **Seed Grant Scheme** funds faculty-driven innovation with real-world sustainability outcomes.

Select Projects (2024–25):

Principal Investigator	Department	Title	Grant (₹)
Dr. Debanjan Mukherjee	Electrical Engineering	Grid-Connected Photovoltaic System for Institute Building (Energy-Water Linkage)	36,45,000
Dr. Sandhimita Mondal	Biotechnology	Solid Waste Management Practices at Academic Institutes – Greywater Reuse Integration	3,50,000
Dr. Sudipta Chatterjee	ECE	Interactive Robot for Campus Sanitation Monitoring	2,40,800

These projects link energy efficiency, sanitation, and automation—creating prototypes that make both **clean water and clean energy** more accessible.

Unnat Bharat Abhiyan: Water and Sanitation Interventions: Through the **Ministry of Education's Unnat Bharat Abhiyan**, Brainware University adopted five rural villages—Faldi, Dubgaria, Panshila, Chaturia, and Chak Barbaria.

UBA Projects (2024–25):

Village	Project Title	Faculty Lead

Faldi	Miniaturized Portable Nanofiltration Bottles from Kitchen Waste	Dr. Sriparna De
Dubgaria	Safe Drinking Water Awareness Workshops	Dr. Jayeeta Mazumdar
Faldi–Chaturia	Solar Street Lights & Water Pumps Installation	Dr. Sarathamani
Panshila	Vermicompost and Greywater Recycling Project	Dr. Sandhimita Mondal

Campus Sustainability and Water Reuse Systems

Brainware University has transformed its own campus into a **living laboratory of sustainability**.

Key Features Implemented in 2024–25:

- Fully functional **rainwater harvesting system** across academic and residential blocks.
- Dual plumbing in hostels for recycling treated wastewater.
- 70% of wastewater reused for gardening and landscaping.
- Quarterly water-quality monitoring in collaboration with Chemistry Department labs (100% compliance with WHO standards).
- Plastic-free initiative eliminating 3,000 single-use items in 2024–25.

The university aims to achieve **zero-liquid discharge certification** by 2026, placing it among West Bengal's first self-sufficient academic campuses in water management.

Research Publications and Technological Innovations

Brainware faculty published several research papers directly addressing water quality, environmental pollution, and sanitation technology.

Representative Publications (2024–25):

- *"Assessment of Physico-Chemical Parameters of Wetland Water in West Bengal,"* WBPCB Journal (2025).
- *"Eco-friendly Nanofiltration for Rural Drinking Water,"* Journal of Applied Nanotechnology (2024).
- *"Biopolymer Membranes for Biomedical and Environmental Purification,"* Int. Journal of PharmTech (2025).

Patents Aligned to SDG 6:

Patent Title	Department	Status
Device for Measuring Water Pollutants Level	CSE	Granted
Bamboo-Based IoT Air Conditioning & Water Treatment System	CSS	Published
IoT-Enabled Smart Waste Management Bin	CSE	Granted
Real-Time IoT Soil and Water Health Monitoring System	CSS	Published

These innovations demonstrate how **IoT, AI, and biotechnology** converge to create **affordable water and sanitation technologies**.

NSS and Outreach Activities

Brainware's NSS units organized multiple field activities focusing on **hygiene awareness, disease prevention, and water conservation**.

Major Outreach Events (2024–25):

- *World Water Day Celebration* (March 22, 2025) – 250 students participated in seminar "Every Drop Counts."
- *Swachhata Hi Seva Drive* (Oct 2024) – Sanitation and waste segregation in Faldi and Hyderbelia villages.
- *Menstrual Hygiene and Health Camp* (Nov 2024) – 80 women trained in hygiene and sanitation practices.
- *Plastic-Free Campus Week* (Feb 2025) – Awareness drive reducing single-use plastic by 70%.

Collaborations and Partnerships

Brainware University recognizes that clean water challenges demand collaborative solutions.

Strategic Partners for SDG 6 (2024–25):

Partner	Collaboration Type	Contribution
West Bengal Pollution Control Board	Research & Training	Groundwater study and filter prototype testing
North City Hospital	Outreach Partner	Medical testing support during health camps
SWADES NGO	Community Partner	Household water awareness in Panshila
Fraunhofer IIS, Germany	R&D MoU	IoT-based water sensor systems
Kasama University, Zambia	Academic Exchange	Comparative rural sanitation study

These partnerships strengthen the **science–policy–society interface** and scale innovations beyond campus.

The 2024–25 academic year reaffirmed Brainware University's role as a **regional leader in water sustainability**.

Through a blend of science, community engagement, and institutional will, the university advanced the vision of **"Water for All."**

Research-driven filtration projects, student-led awareness campaigns, and campus sustainability measures have collectively contributed to cleaner water, better sanitation, and healthier communities.

Brainware's model shows that **SDG 6 is not just an environmental agenda—it is a social contract**. Every drop saved, every family empowered, and every innovation deployed brings the university closer to a world where **clean water is a right, not a privilege**.