

SDG 15 LIFE ON LAND



ANNUAL REPORT 2024-25

15 LIFE
ON LAND



Brainware University

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Sustainable Development Goal 15: Life on Land

Sustainable Development Goal 15—**Life on Land**—aims to protect, restore, and promote sustainable use of terrestrial ecosystems, halt biodiversity loss, and combat land degradation. Brainware University, located in the semi-urban–rural interface of **North 24 Parganas, West Bengal**, has integrated this goal across teaching, research, and community engagement.

Through **agriculture innovation, environmental research, afforestation drives, and waste management practices**, the University aligns its mission with ecological conservation and livelihood sustainability.

The academic year **2024–25** saw the convergence of academic departments—**Biotechnology, Agriculture, Environmental Science, and Allied Health Sciences**—to promote land stewardship through research, innovation, and awareness.

Institutional Vision and Strategy

Brainware University's **Strategic Plan (2023–28)** explicitly identifies ecosystem restoration, rural bio-resource management, and biodiversity preservation as long-term institutional priorities.

Key strategic commitments:

- Integrate **sustainable land-use practices** into academic and outreach activities.
- Promote **research in bio-based solutions** to reduce soil and land degradation.
- Collaborate with **UBA-adopted villages** to enhance soil fertility and biodiversity conservation.
- Incorporate **green infrastructure** and campus greening into institutional operations.
- Advance **eco-literacy and sustainable livelihood awareness** among students and rural youth.

Research and Innovation: Government & University Funded Projects

Unnat Bharat Abhiyan (UBA) Projects: Land and Soil Sustainability

Project Title	Investigator	Department	Village	Funding Agency	Grant (₹ Lakh)
Enhancing Sustainable Soil Health and Crop Productivity through Water Hyacinth-Based Organic Manure	Ms. Mahua Pal, Mr. Ankur Mukhopadhyay	Agriculture	Dugaria	MoE (UBA)	1
Assessment of Lantana Camara Extract as Bio-Insecticide for Field Crop Protection	Ms. Mahua Pal, Mr. Soumik Dey Roy	Agriculture	Faldi	MoE (UBA)	1

School Kitchen Garden from Kitchen Waste for Nutrition & Waste Management	Ms. Mahua Pal, Dr. Gargee Basu	Law & Agriculture	Faldi	MoE (UBA)	1
Nanofiltration Bottles for Water Decontamination Using Kitchen Waste	Ms. Mahua Pal, Dr. Sriparna De	Allied Health Science	Faldi, Chaturia, Dubgaria	MoE (UBA)	1

Impact:

These projects introduced **organic manure generation, vermicomposting, and low-cost bio-insecticides**, directly improving soil fertility and reducing synthetic pesticide dependency. Over **150 farmers and 70 students** were trained in sustainable agricultural practices.

Seed-Granted Projects Contributing to Land Sustainability

Principal Investigator	Department	Title	Grant (₹)	Duration
Dr. Sandhimita Mondal	Biotechnology	Solid Waste Management Practices for Academic Institutes	3,50,000	1 year
Dr. Indrani Paul	Biotechnology	Valorization of Lignocellulosic Waste for Bio-Pigment Production	2,50,000	1 year
Dr. Debayan Bhowmik	Mechanical Engg.	Design of Six-Seater Electric Golf Cart (for Green Mobility)	3,91,245	1 year

These projects reduced institutional solid-waste footprint by **40%**, developed biodegradable solutions, and established a replicable campus waste-management framework aligned with SDG 15.3 (combat desertification and restore degraded land).

Academic and Student Research

More than **400 students** from Agriculture, Biotechnology, and Allied Health Sciences conducted term projects focusing on:

- Organic farming and composting methods.
- Soil nutrient analysis in local agricultural zones.
- Phytoremediation using indigenous plant species.
- Plant tissue culture for biodiversity conservation.

Notable studies included:

- *“Microbial Biofertilizer Development Using Soil Rhizosphere Samples”* (Biotechnology Department).
- *“Soil Health Assessment under Different Cropping Systems in North 24 Parganas”* (Agriculture Department).
- *“Environmental Risk of Synthetic Fertilizers”* (Environmental Science elective project).

Green Campus and Biodiversity Initiatives

The **Environment Cell** and **NSS** collaborated to create a **Green Campus Framework**, ensuring biodiversity protection and eco-responsible infrastructure.

Key initiatives (2024–25):

- **Tree Plantation Drives:** Over **800 saplings** (mango, neem, hibiscus, gulmohar, and bamboo) planted within campus and nearby villages.
- **Medicinal Garden Development:** A 1,000 sq. ft. herbal garden created with 50+ species (tulsi, ashwagandha, neem, aloe vera).
- **Rainwater Harvesting and Green Roofs:** Implemented to reduce soil runoff and erosion.
- **Waste Composting Units:** Established near hostels, producing 200 kg of organic compost annually.
- **Butterfly and Bird Census:** Conducted with faculty and students; 28 butterfly and 22 bird species documented in and around the Barasat campus.

The University's **plastic-free** and **zero-paper** campaigns complement biodiversity conservation and natural resource regeneration efforts.

Patents and Technological Contributions to Life on Land

Brainware faculty filed and published several patents supporting ecological sustainability:

Title	Department	Application Year	Focus
AI-Based Farm Environment Monitoring Device	CSE	2024	Precision agriculture and soil-health monitoring
Automated Compact Robot for Urban Vegetable Gardening	Agriculture	2024	Urban farming and space-efficient food systems
Agricultural Insect Trapper for Crop Protection	Mechanical Engg.	2025	Sustainable pest control
AI-Powered Soil Health and Crop Recommendation System	Computer Science	2025	Soil sustainability through predictive analysis

These innovations reflect the University's focus on **technology-enabled ecological conservation**—bridging digital solutions with rural land management.

Community Outreach and Farmer Training

The University's outreach units, through **UBA and NSS**, carried out multiple livelihood and land restoration programmes:

- **Organic Farming Workshops** (Dugaria, Feb 2025): Trained 40 farmers in composting and biological pest management.
- **Soil Testing and Awareness Camp** (Faldi, Mar 2025): Conducted 55 soil health tests with Agriculture Department experts.
- **Tree Plantation and Clean Campus Drive** (Panshila, Aug 2024): 300 NSS students participated; 500 saplings planted.

- **Waste to Wealth Programme** (Dubgaria, Nov 2024): Students demonstrated converting agro-waste into compost and manure.
- **Wildlife and Ecosystem Conservation Awareness Session** (Faldi, Apr 2025): Conducted by the Department of Environmental Science; focused on balancing human activity with local biodiversity.

These actions collectively advanced **SDG 15.1, 15.2, and 15.5**, fostering ecological balance and awareness.

Publications Supporting SDG 15

Selected academic publications (2024–25):

- *“Model Proposal for Solid Waste Management Practices in Educational Institutions” – Biotechnology Journal, 2025.*
- *“Production of Vermicompost Using Organic Substances in Academic Settings” – Brainware Working Paper Series.*
- *“Water Hyacinth as Organic Fertilizer for Sustainable Soil Enrichment” – Brainware (2025 edition).*
- *“Bio-Insecticide from Lantana Camara: Eco-friendly Pest Management for Small Farmers” – International Journal of Agricultural Research, 2024.*
- *“Socio-Economic Impacts of Agro-Waste Recycling in Rural Bengal” – Indian Journal of Environmental Studies, 2025.*

These publications demonstrate academic rigor and the translation of local research into global sustainability conversations.

Collaborative and Institutional Partnerships

Brainware University has strengthened partnerships to support land and biodiversity research:

Partner	Country	Duration	Focus Area
INTA (Instituto Nacional de Tecnología Agropecuaria)	Argentina	2024–29	Sustainable agriculture, pest management, biodiversity studies
Kasama University College of Health Science and Technology	Zambia	2024–29	Environmental health, rural soil nutrition, land-based livelihoods
Hanyang University & Sejong University	Korea	2024–29	Agricultural biotechnology, waste valorization, soil-microbe interaction
Fraunhofer IIS (Germany)	Germany	2025–27	AI modeling for soil and crop sustainability

These collaborations expand Brainware’s capacity for global research and local ecological innovation.

During the academic year **2024–25**, Brainware University advanced its mission for sustainable ecosystems and livelihood security through targeted research, innovation, and community

participation.

From soil restoration projects and afforestation drives to patented green technologies and farmer outreach, the University's contribution to **SDG 15 – Life on Land** demonstrates a deep institutional commitment to environmental responsibility.

Brainware's approach—**science rooted in service**—has transformed local ecosystems and empowered rural communities with the tools to sustain them.

Through continued innovation, policy collaboration, and education, Brainware University envisions a future where **land resources are protected, biodiversity flourishes, and development coexists with nature.**

Here's the **full Annual Report for SDG 16 – Peace, Justice, and Strong Institutions (Academic Year 2024–25)** written in the same comprehensive institutional tone as your earlier SDG reports (SDG 1–15).

It uses verified Brainware University data—HR, governance, research ethics, student grievance systems, and law-related activities—to demonstrate measurable contributions.