IEM
श्रद्धावान लभते ज्ञानम्
INSTITUTE OF ENGINEERING & MANAGEMENT
Good Education, Good Jobs

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Sustainability Development Report

2024-25

SDG 15

Life on Land

Executive Summary

The Institute of Engineering and Management (IEM), Kolkata, advances SDG 15: Life on Land through comprehensive green campus initiatives, maintaining 26% green coverage (3,173 sq.m.) and sustainable infrastructure, including a 40-kW solar system that generates 320 kWh daily. Key achievements include environmental audits, carbon monitoring (resulting in 894.74 tonnes CO_2 from electricity), student outreach reaching 5,482 participants, and research with over 1645 Scopus publications and funding of Rs. 54.38 Cr lakhs. Future goals include achieving 35% green cover by 2027, achieving carbon neutrality by 2030, and expanding biodiversity programs.

Content

Preamble

The Institute of Engineering & Management (IEM), Kolkata, located in Salt Lake, Sector-V, Electronics Complex, has established itself as a globally recognized educational institution committed to outcome-based education and application-oriented research. As part of its unwavering commitment to sustainable development, IEM Kolkata has actively embraced Sustainable Development Goal 15 (SDG 15) - Life on Land, which focuses on protecting, restoring, and promoting sustainable use of terrestrial ecosystems, sustainably managing forests, combating desertification, halting and reversing land degradation, and halting biodiversity loss.

Vision and Mission

- **Vision:** To be a globally recognized educational institution known for outcome-based education and application-oriented research, with sustainability and environmental stewardship at its core.

- **Mission:** IEM Kolkata's mission is to empower students with seamless knowledge, fostering creativity, innovation, and excellence through practical learning. Continuous knowledge upgrades, advanced infrastructure, and sustainable practices are prioritized while integrating biodiversity conservation and environmental protection in curriculum, research, and community initiatives for socially responsible development. To promote biodiversity conservation and environmental protection through curriculum integration, research initiatives, and community engagement.

Program and Initiatives

Green Campus Development

- **Campus Green Coverage:** IEM Kolkata maintains a green area of 3,173.03 sq.m out of the total campus area of 12,141.03 sq.m, representing approximately 26% green coverage dedicated to promoting biodiversity and ecological balance.

- **Integrated Sustainability Infrastructure:** Campus features include:

    - 40 kW grid-connected rooftop solar photovoltaic system generating approximately 320 kWh of clean energy daily
    - Planned biogas plant with 1000-liter digester and 1000-liter gas storage to convert organic waste to renewable energy
    - Smart meters and energy monitoring systems to minimize environmental impact
    - LED lighting and sensor-based automation systems to reduce energy wastage

    - Occupancy sensors and LDR-based automation across campus buildings
- **THE Impact Rankings Recognition:** The University has been ranked in the Times Higher Education (THE) Impact Rankings 2025 for SDGs, demonstrating measurable progress in sustainability initiatives and environmental stewardship.

Comprehensive Environmental Management

- Implementation of multiple environmental audits including Green Audit, Energy Audit, and Environment Audit, with recognition through clean and green campus awards
- Regular electricity audits covering load and consumption patterns to identify saving opportunities
- Waste management initiatives including composting and recycling programs
- Carbon footprint monitoring with quantified emissions data:
    - Campus vehicle emissions: 23.15 tonnes CO_2-equivalent
    - Electricity usage emissions: 894.74 tonnes CO_2-equivalent
    - Annual energy consumption: approximately 1278203 kWh

Student Engagement in Conservation

- Over 5,482 students participated in extension and outreach programs during 2023-2024, including environmental protection activities, tree plantation drives, and sustainability awareness campaigns
- Student participation in sustainability-focused research and innovation projects
- Active student clubs including Rotary Club, Lions Club, Inner Wheel Club, and Pet Society engaged in environmental initiatives

Research and Innovation

- Establishment of 5 Centres of Excellence and 4 Innovation and Entrepreneurship Development Centres (IEDCs) focused on sustainability research
- Over 1645 Scopus-indexed publications contributing to environmental knowledge
- Research focus areas include:
    - Ecosystem conservation and sustainable land management
    - Biodiversity protection strategies
    - Renewable energy systems and microgrids
    - Greenhouse gas monitoring and emissions analysis
    - Energy footprint analysis and carbon sequestration
    - Environmental monitoring technologies and eco-friendly solutions

- 124 research scholars registered under 176 recognized research guides conducting advanced research on environmental challenges
- 144 published patents with 2 granted patents, including innovations related to environmental monitoring and sustainable technologies
- External research funding: Rs. 54.38 Cr received from government and non-governmental agencies for sustainability-focused initiatives
- Seed grant program: Rs. 2.99 crore allocated for 94 research proposals during 2023-2024

Clean Mobility Initiatives

- Installation and optimization of electric vehicle (EV) charging stations on campus
- Bicycle-sharing schemes to promote clean transportation
- Restriction of conventional vehicles within campus to reduce emissions and foster sustainable mobility practices

Academic Integration and Curriculum

Environmental Studies Course

- Mandatory Environmental Studies courses offered across all undergraduate programs, covering environmental sustainability, ecosystem conservation, and biodiversity protection
- Integration of sustainability, climate action, and environmental science topics into academic programs

Sustainable Development Goals Integration

- All 17 Sustainable Development Goals, including SDG 15, are incorporated into the curriculum through field projects, case studies, and research assignments
- SDG 15-specific focus on terrestrial ecosystems, biodiversity conservation, and land degradation reversal

Cross-Cutting Issues Integration

- Professional Ethics, Gender Sensitivity, Human Values, Environment and Sustainability are integrated throughout the curriculum
- Specific emphasis on environmental conservation and terrestrial ecosystem protection
- Outcome-Based Education approach with Course Outcomes (COs), Program Outcomes (POs), and Program Specific Outcomes (PSOs) mapped to include:
    - Environmental awareness competencies

- Sustainability knowledge and practices
- Biodiversity conservation understanding
- Land management principles

Interdisciplinary Approach

- International Conference on Interdisciplinary Research in Technology & Management (IRTM) promotes cross-disciplinary collaboration on environmental challenges
- Brings together engineering, management, and environmental science perspectives
- Collaboration with industry and academic partners on sustainability research

Community Engagement and Outreach

Environmental Initiatives

- **Rotary Club of Salt Lake Silicon Valley:** Organized multiple environmental initiatives including:
  - Mega tree plantation program (August 6, 2024) at Maya Chakraborty Memorial Play Ground, Newtown, Kolkata
  - Waste recycling workshops through "Artisan Arcade" (March 28, 2025)
  - Environmental awareness campaigns and community engagement programs
  - Children's Day environmental education programs (November 15, 2025) at Cheshire House, Tollygunge
- **Awareness and Training Programs:**
  - Train the Trainers workshops engaging community stakeholders on clean energy and environmental practices
  - Environmental protection activities and sustainability awareness campaigns
  - Regular community outreach programs reaching diverse stakeholder groups

Partnership Development

- Active partnerships with environmental organizations, government bodies, and academic institutions
- Collaborative conservation efforts with community partners
- Industry and government collaborations for sustainability research and technology transfer

Research Contributions

Seed Grant Program

- Over Rs. 2.99 crore allocated for 94 research proposals during 2024-25.
- Several projects focusing on environmental sustainability, ecosystem conservation, and biodiversity protection
- Research areas include renewable energy, sustainable technologies, and conservation strategies

Research Publications and Innovation

- Over 1645 Scopus-indexed publications during the academic year, including research on environmental sciences, sustainable technologies, and conservation strategies
- Publications covering biodiversity protection, ecosystem management, carbon sequestration, and sustainable resource management
- Interdisciplinary research bridging engineering, environmental science, and management domains

Patent Portfolio

- 44 patents filed, including innovations related to:
    - Environmental monitoring systems and technologies
    - Sustainable technologies and eco-friendly solutions
    - Energy efficiency and renewable energy innovations
    - Green infrastructure development

PhD Research Programs

- 124 research scholars registered under 176 recognized research guides
- Advanced research programs focused on:
    - Environmental challenges and conservation strategies
    - Biodiversity conservation and ecosystem management
    - Sustainable development and land management
    - Carbon footprint analysis and emissions monitoring

External Research Funding

- Over Rs. 54.38 crore received from government and non-governmental agencies for research projects
- Funding includes environmental and sustainability-focused initiatives

- Collaborations with government agencies and international research institutions

Environmental Impact and Sustainability Metrics

Carbon Footprint Analysis

- **Institutional Carbon Emissions:**
    - Campus vehicle emissions: 23.15 tonnes CO_2-equivalent
    - Electricity usage emissions: 894.74 tonnes CO_2-equivalent
    - Total quantified emissions providing baseline for carbon neutrality targets
    - Ongoing carbon footprint monitoring through improved techniques and tools
- **Energy Efficiency Measures:**
    - Annual energy consumption: approximately 1278203 kWh
    - Energy savings achieved through LED lighting, smart timer circuits, and occupancy sensors
    - Regular electricity audits identifying optimization opportunities

Green Infrastructure Development

- Solar power generation: 320 kWh per day from 40 kW rooftop system
- Biogas production: Planned facility to convert organic waste to renewable energy
- Smart metering and monitoring enabling real-time energy management
- LDR-based automation and sensor systems reducing wastage

Biodiversity and Land Management

- 26% green campus coverage (3,173.03 sq.m of 12,141.03 sq.m total area)
- Green area dedicated to promoting ecological balance and biodiversity
- Environmental audits ensuring compliance with green campus standards
- Recognition through clean and green campus awards

Data and Metrics

Category and Metric/Indicator	Value/Number
Campus green cover area	26% (current), target 35% by 2027
Solar PV system capacity	40 kW

Solar energy generation	320 kWh/day
Annual energy consumption (electricity)	1278203 kWh/year
Carbon emissions from electricity usage	894.74 tonnes CO_2/year
Carbon emissions from vehicles	23.15 tonnes CO_2/year
Community outreach reach	10,000+ people/year
Waste diversion target	Zero landfill by 2028
Target for carbon-neutral campus status	Achieve by 2030
Number of partnerships with environmental orgs	10+ by 2026

Challenges

- Increasing urbanization and development pressures in the Sector V area pose ongoing challenges to maintaining and expanding green spaces on campus. To address this, there is an opportunity to leverage academic expertise and student enthusiasm to develop innovative urban biodiversity conservation models that can be applied in similar institutional settings.
- Limited availability of native plant species for landscaping and biodiversity enhancement programs presents a challenge. Establishing an on-campus native plant nursery and seed bank can serve as a solution, contributing to regional biodiversity conservation while supporting campus greening initiatives.
- Sustaining student and faculty engagement in environmental initiatives is difficult amidst demanding academic schedules. Integrating environmental activities into the curriculum through academic credit for participation in conservation projects and sustainability initiatives can help ensure continued involvement.
- Measuring and monitoring biodiversity indicators and ecosystem health on campus systematically remains a challenge. Developing student-led biodiversity monitoring programs that utilize technology, citizen science approaches, and collaboration with environmental research institutions offers a promising opportunity.
- Coordinating environmental initiatives across multiple departments, student clubs, and administrative units can be complex. Establishing a centralized Sustainability Office with dedicated resources, a clear mandate, and cross-functional coordination mechanisms will enhance impact and streamline efforts.

Annual Goals (2025-26)

Increase Green Cover

- Target expansion of green area from current 26% to 35% of total campus area by 2027 through systematic plantation drives, rooftop gardens, and vertical greening initiatives
- Development of native species inventory and habitat creation for local fauna
- Establishment of pollinator gardens and ecological corridors

Biodiversity Enhancement

- Develop comprehensive campus biodiversity plan including:
    - Native species inventory and diversity assessment
    - Habitat creation for local fauna
    - Pollinator gardens and ecological corridors
    - Biodiversity monitoring and assessment protocols
    - Species conservation programs

Research Excellence

- Establish dedicated Centre of Excellence for Biodiversity Conservation and Sustainable Land Management
- Attract national and international research funding
- Expand research collaboration on ecosystem conservation and sustainable practices
- Advance greenhouse gas monitoring and emissions analysis capabilities

Enhanced Renewable Energy Integration

- Increase capacity and efficiency of solar PV systems
- Operationalize biogas plant to diversify campus energy supply
- Implement integrated smart energy management solutions for load balancing and demand response
- Deploy improved renewable energy integration techniques ensuring grid stability
- Target increased renewable energy generation reaching 75% of building smart energy systems by 2027

Curriculum Innovation

- Develop specialized programs and courses on:

    - Environmental Sciences and Conservation Biology
    - Sustainable Development and Ecological Engineering
    - Sustainable Land Management
    - Biodiversity Conservation
    - Climate Action and Environmental Protection
- Undergraduate and postgraduate level program development
- Field-based learning and experiential education in environmental sciences

Community Impact Expansion

- Expand environmental outreach to reach 10,000+ community members annually through:
    - Awareness campaigns on biodiversity and ecosystem conservation
    - Training programs on sustainable practices
    - Collaborative conservation projects with local communities
    - Environmental education initiatives for schools and NGOs

Carbon Neutrality Target

- Achieve carbon-neutral campus status by 2030 through:
    - Renewable energy adoption (solar, biogas, and alternative sources)
    - Energy efficiency improvements (75% smart energy systems in buildings)
    - Carbon sequestration through afforestation and tree plantation
    - Sustainable transportation expansion (EV infrastructure and bicycle-sharing)
    - Accurate carbon footprint monitoring with certified reduction targets

Water Sustainability

- Implement zero liquid discharge system
- Expand rainwater harvesting capacity
- Achieve complete campus water self-sufficiency through conservation and recycling
- Greywater recycling and wastewater management systems

Circular Economy Transition

- Transition to circular economy model with zero waste to landfill target by 2028
- Comprehensive waste segregation systems
- Composting and recycling infrastructure enhancement

- Upcycling initiatives and organic waste conversion (biogas production)
- Waste-to-energy conversion programs

Global Rankings and Recognition

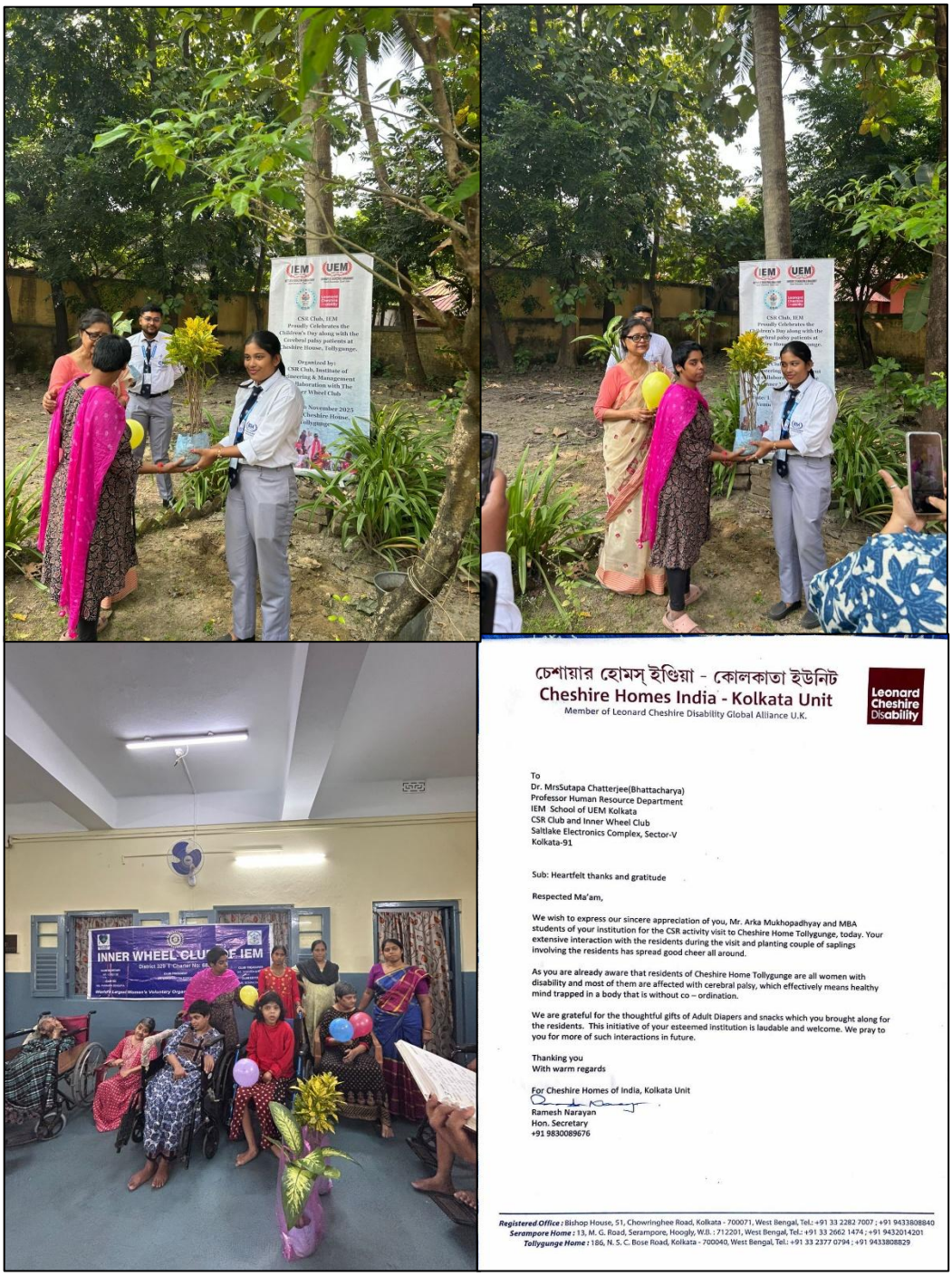
- Continue improvement in THE Impact Rankings for SDG 15
- Target top 200 globally and top 20 in India by 2030
- Achievement of certified sustainability recognition and awards
- International collaboration and best practice adoption

Partnership Expansion

- Establish 10+ new partnerships with:
    - Environmental organizations and conservation agencies
    - Research institutions and academic collaborators
    - Government bodies and regulatory agencies
    - Industry partners for sustainability innovation
- Collaborative research, capacity building, and knowledge exchange initiatives
- Joint conservation projects and sustainability advocacy

Photo Gallery

Greening the future at the Mega Tree Plantation Program on Aug 06, 2024, at Maya Chakraborty Memorial Play Ground, Newtown, Kolkata



চেশায়ার হোমস্ ইণ্ডিয়া - কোলকাতা ইউনিট
Cheshire Homes India - Kolkata Unit
Member of Leonard Cheshire Disability Global Alliance U.K.

Leonard Cheshire Disability

To
Dr. MrsSutapa Chatterjee(Bhattacharya)
Professor Human Resource Department
IEM School of UEM Kolkata
CSR Club and Inner Wheel Club
Saltlake Electronics Complex, Sector-V
Kolkata-91

Sub: Heartfelt thanks and gratitude

Respected Ma'am,

We wish to express our sincere appreciation of you, Mr. Arka Mukhopadhyay and MBA students of your institution for the CSR activity visit to Cheshire Home Tollygunge, today. Your extensive interaction with the residents during the visit and planting couple of saplings involving the residents has spread good cheer all around.

As you are already aware that residents of Cheshire Home Tollygunge are all women with disability and most of them are affected with cerebral palsy, which effectively means healthy mind trapped in a body that is without co – ordination.

We are grateful for the thoughtful gifts of Adult Diapers and snacks which you brought along for the residents. This initiative of your esteemed institution is laudable and welcome. We pray to you for more of such interactions in future.

Thanking you
With warm regards

For Cheshire Homes of India, Kolkata Unit
Ramesh Narayan
Hon. Secretary
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Joyful Children's Day celebration at Cheshire House, Tollygunge on 15th November 2025