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SIES
Indian Institute of Environment Management
RISE WITH EDUCATION

ECOINSIGHTS

A Quarterly E-Magazine on Environment & Sustainable Development

CURRENT ISSUE: "CARBON MANAGEMENT AND CLIMATE ACTION "

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About Us

Founded in 1999, the SIES Indian Institute of Environment Management (SIES IIEM) is a premier academic and research institution committed to advancing sustainable practices through innovative research, comprehensive education, and impactful training programs. Recognized by the Department of Scientific and Industrial Research (DSIR), Government of India, the institute is ISO 9001:2015 certified for its Research & Development and laboratory testing services.

Some of our major activities include Academics, Research & Development, Industrial Consultancy, Environmental & Green Audits, Laboratory Testing and Outreach Activities. The institute also offers a range of academic programs, including Ph.D. program in Environmental Sciences, affiliated to University of Mumbai; M.Sc. in Sustainable Development and Environment Management, affiliated to Garware Institute of Career Education & Development (GICED); and, an online Post Graduate Diploma in Sustainable Environment Management (PGDSEM) for working professionals.

Since its inception, SIES IIEM has established strong collaborations with government and non-government agencies, industries, academia and environmental consultancies. The institute is equipped with state-of-the-art laboratories and is at the forefront of pioneering solutions for sustainable environmental management. Institute's core Research Areas on Environment and Energy include, Management of Natural Resources, Water Resources, Air Quality, Solid Waste, and Radioactive Waste; , Energy Transitions, Conservation, and Management; and Global Issues of Climate Change & Global Warming; Ozone Depletion; Trade and Environmental Linkages; Forest and Biodiversity, etc.

The institute specializes in conducting comprehensive Green Audits and offering specialized environmental consultancy services. Our green audit services assist organizations in assessing their environmental impact, identifying areas for improvement, and developing strategies to reduce their ecological footprint. We help organizations achieve sustainability goals while ensuring compliance with the environmental regulations. At SIES IIEM, we continue to lead the way in sustainability education and environmental research, driving positive change and fostering a sustainable future for all.

MISSION

To harness the power of Science, Technology and Innovation in pollution control, management of natural resources and excellence in academics to promote environmental, social and institutional sustainability.

CONTENTS

Editorial

The effects of climate change are becoming increasingly evident, with rising global temperatures, recurrent extreme weather events, and destabilization of our ecosystems and communities. The enhanced release of greenhouse gases (GHGs), primarily carbon dioxide (CO_2), into the atmosphere are the main casual factors. As we move into this quarter, the theme of "Carbon Management and Climate Action" is fundamental to global efforts to address the climate crisis. This issue of our E-Magazine highlights the carbon management efforts aimed at reducing carbon footprints.

Carbon management, through strategies and actions aimed at reducing and controlling the release of CO_2 and other GHGs into the atmosphere, is one of the most effective ways to combat climate change. Transitioning from fossil fuels to renewable energy sources such as solar, wind, and hydropower can significantly reduce emissions. Similarly, making energy-efficient buildings and adopting to cleaner modes of transport are some effective measures for reducing our carbon footprint.

Additionally, carbon management includes carbon capture technologies designed to capture CO_2 emissions at their source, preventing them from entering the atmosphere. When combined with reforestation and advanced soil carbon sequestration strategies, these technologies can play a key role in offsetting emissions from sectors like aviation and heavy industry, which are otherwise difficult to decarbonize.

Climate action involves altering our consumption and production patterns, reshaping industries, and implementing policies that incentivize sustainable practices. International cooperation is essential to ensure that all countries meet their emission reduction targets while also investing in adaptation and mitigation strategies. Educating individuals to adopt more sustainable lifestyles can foster the transformation needed to combat climate change by equipping people with the information, tools, and incentives to take appropriate action.

To limit global warming to 1.5°C above pre-industrial levels, global carbon emissions must be reduced by nearly fifty per cent by 2030, with a goal of achieving net-zero emissions by mid-century. Effective climate solutions must prioritize social equity, ensuring that the communities most impacted by environmental degradation are equipped with the resources and opportunities to adapt. Achieving this will require a coordinated effort, encompassing technological innovation, policy reforms, attitudinal shifts, and strong global leadership.

Each step we take towards effective carbon management brings us closer to an equitable, sustainable, and more resilient world.

Dr. Sangeeta Sharma
Director (I/C), SIES IIEM

Carbon Management Technologies Based on Different Energy Vectors Towards Net Zero

Dr. Amrita Dutta
Assistant Professor,
SIES Indian Institute of Environment Management

An energy vector is a substance or a method to transport energy from one place to another. Carbon-less or carbon-free energy vectors like bio/synthetic fuels, hydrogen, and ammonia can leverage existing fossil fuel-based energy infrastructure and potentially serve various energy applications, including transport, by offering high energy density and compatibility with current engines. Hydrogen is an essential energy vector in systems that use the flexibility between different energy networks.

Hydrogen has been generating massive expectations as a carbon-free economy enabler, but issues related to storage, distribution, and infrastructure deployment are delaying its full implementation. On the other hand, Ammonia, stands as a highly efficient energy vector delivering high energy density and an established and flexible infrastructure capable of mitigating hydrogen's key drawbacks. Ammonia as a hydrogen carrier has great potential as a carbon-free fuel with promising energy systems applications.

As reported in "Statistical review of world energy" by the British Petroleum (BP) Company (London, United Kingdom), the global R/P (reserve/production) ratios of fossil fuels reveal that oil and natural gas could still be exploited for 50 years as estimated. In contrast, for coal, the exploitation duration has been estimated at 132 years [1]. This exploitation duration has been extrapolated and assessed relying on the proved reserves in 2019 and considering the current production.

While oil and natural gas consumption has grown over the last couple of years, coal consumption has declined due to the growing use of natural gas and the development of renewable energy sources (RES), particularly in the power sector. However, despite the decrease in consumption, coal remains the most used fuel for power generation (around 36.4%). In comparison, natural gas represents 23.3%, followed by hydroelectric (around 15.6%), and then by renewables (about 10.4%), surpassing nuclear (approximately 10.35%) for the first time.

Over the last few years, the huge penetration of RES (wind, solar photovoltaic) in power generation combined with slower growth in energy demand has led to a consequential slowdown in the rise of greenhouse gas (GHG) emissions. Indeed, the global capacity of photovoltaic energy reached 586 GW in 2019 (an increase of 20% compared to 2018), whereas the global capacity of wind energy represents 622 GW (a rise of 10.4% compared to 2018) [1]. Despite the growing development and the interest in RES, some economic sectors, such as energy production, transportation, and industry, still suffer from releasing a large amount of CO2 emissions caused by using fossil fuels.

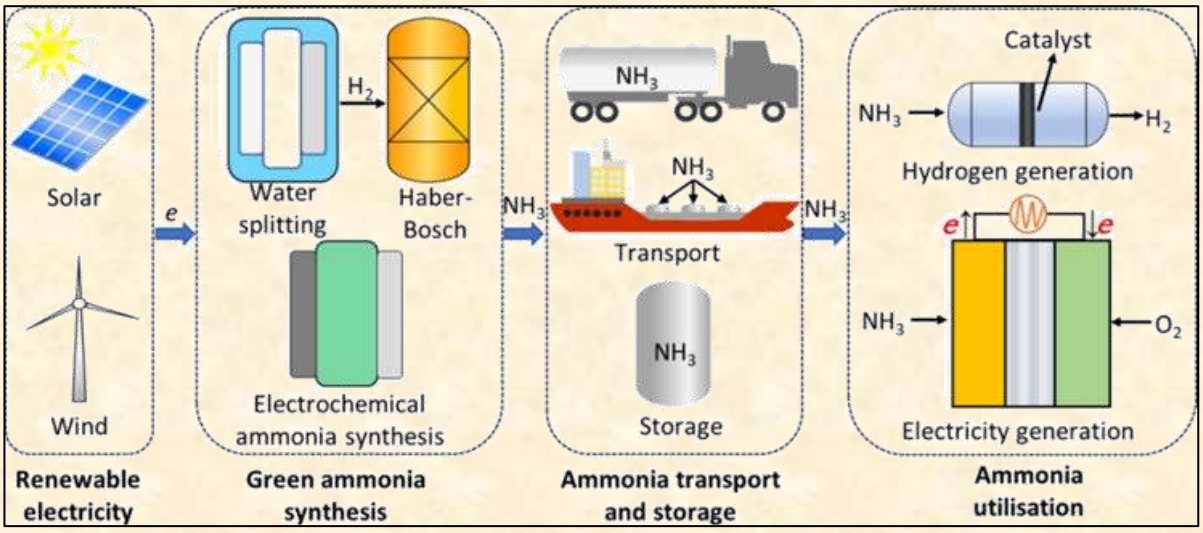
To avoid or overcome these challenging issues, the deployment of hydrogen as a sustainable green fuel has attracted a lot of attention from researchers, industries, and governments over the last few years. Hydrogen as an energy carrier represents several benefits, such as its combustion with oxygen, generating only non-toxic water and a high energy density per unit mass (120 MJ.kg−1).

This energy density is nearly three times higher than gasoline (44 MJ·kg−1) and kerosene (42.8 MJ·kg−1), supplying cars and aircraft, respectively. Thus, Hydrogen is recognized as a promising and attractive energy carrier for decarbonization [2]. The storage and transportation of hydrogen are the key challenges for devising hydrogen technologies in applications (transportation, stationary, and portable power). Therefore, the development of advanced hydrogen storage and transportation solutions is required to offer a higher energy density.

Hydrogen carriers

Besides metal hydrides, Hydrogen-enriched compounds, which are liquid at mild conditions, such as ammonia, methane, and methanol, have recently gained attention as a distribution medium or for storage of hydrogen. The hydrogen in ammonia can be released through the decomposition process; therefore, wider possibilities for hydrogen utilization can be realized. Unlike methanol decomposition, ammonia decomposition produces no carbon monoxide, resulting in stable hydrogen utilization **(Fig.1)**.

Figure: 1: Ammonia as an effective hydrogen carrier



Source: Wang et al (2021)

Gaseous hydrogen storage requires high-pressure vessels of up to 70 MPa, while liquid storage needs cryogenic tanks maintained at -253°C. Compared to conventional fuels, hydrogen has a low volumetric energy density in both gas and liquid form [3]. In contrast to other forms of chemical storage, ammonia is the only carbon-free hydrogen carrier and can be synthesized from renewable sources as demonstrated by the opening of a pilot plant by Siemens in Oxfordshire, UK in June 2018 and a "green ammonia" plant by Nel Hydrogen and Yara starting up in Western Australia recent year.

Ammonia is a promising hydrogen carrier owing to its high hydrogen content (17.65 wt.%). Hydrogen can be released on demand from ammonia through catalytic decomposition and consumed in a Proton Exchange Membrane (PEM) fuel cell. Alternatively, ammonia can be combusted directly or used in an ammonia-fed fuel cell.

Conclusion

Hydrogen is a promising secondary energy source (energy carrier) for the future. However, because of its very low volumetric energy density in a gaseous form under atmospheric conditions, hydrogen needs to be stored and transported effectively in any form, with high gravimetric and volumetric hydrogen densities. Among the available technologies, ammonia shows superiorities over the others, especially in terms of storage, transportation, and utilization. Ammonia has strong advantages compared to other hydrogen storage media because it can be stored as a liquid under mild conditions.

Therefore, the storage and transportation infrastructure as well as regulations, are well established. Finally, ammonia utilization covers numerous different technologies, including internal combustion engines, combustion for turbines, and fuel cells. In terms of total energy efficiency, ammonia fuel cells with direct feeding are believed to be promising. Further studies correlated to energy-efficient and cost-effective ammonia production and utilization are demanded. These technologies should be developed in the context of CO_2-free systems.

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Carbon Management and Climate Actions

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Introduction

With global temperatures rising and environmental degradation accelerating, carbon management and climate actions have emerged as critical strategies in combating climate change. The increasing concentration of greenhouse gases (GHGs), primarily carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), has led to alarming consequences, including rising sea levels, extreme weather events, biodiversity loss, and disruptions to food and water security. These environmental challenges threaten economic stability, human well-being, and the future of the planet.

Climate change is not just an environmental issue, it has profound social and economic implications. Developing nations, including India, face a dual challenge in ensuring economic growth and improving living standards while mitigating climate risks. Transitioning to a low-carbon economy requires comprehensive policies, innovative technologies, and global cooperation.

By implementing robust carbon management strategies and building international partnerships, countries can move toward a sustainable, climate-resilient future.

Understanding Carbon Management

Carbon management refers to the systematic approach of measuring, reducing, and offsetting carbon emissions to minimize their environmental impact. Its integration into national policies and corporate frameworks is essential to driving large-scale emission reductions. Governments, businesses, and communities contribute to this effort by implementing effective mitigation measures. Strong carbon management is fundamental to meeting climate commitments, including net-zero targets. The major aspects of carbon management include:

Carbon Footprint Assessment: This involves identifying and quantifying major emission sources, including industries, transportation, and energy consumption. A detailed assessment helps in formulating effective reduction strategies.

Emission Reduction Strategies: These involve implementing energy-efficient technologies, adopting cleaner production methods, and promoting sustainable urban development to reduce overall carbon emissions.

Carbon Offsetting: Since not all emissions can be eliminated immediately, carbon offsetting helps balance unavoidable emissions. This can be achieved through afforestation, reforestation, wetland restoration, and renewable energy projects that absorb or mitigate carbon emissions.

Carbon Trading & Credits: Market-based mechanisms like carbon credits and cap-and-trade programs allow industries to buy and sell emission allowances, incentivizing companies to invest in cleaner technologies.

Climate Actions and Global Commitments

International Climate Agreements

Climate change is a global crisis that requires coordinated international efforts. The Paris Agreement (2015) is a landmark treaty under the United Nations Framework Convention on Climate Change (UNFCCC) that aims to limit global temperature rise to well below 2°C, with an aspirational goal of 1.5°C above pre-industrial levels. Signatory nations have committed to reducing their emissions through Nationally Determined Contributions (NDCs), which outline their specific climate action plans. Other important international climate agreements include the **Kyoto Protocol (1997)**, a legally binding agreement that established emission reduction targets for developed countries; and the **United Nations Sustainable Development Goals (SDGs)** wherein the Climate action is integral to achieving the 2030 Agenda for Sustainable Development, particularly SDG 13 (Climate Action).

India's Climate Commitments

India has been a proactive participant in global climate discussions and has developed a comprehensive climate action framework under the National Action Plan on Climate Change (NAPCC). The plan includes eight core missions aimed at reducing carbon emissions, enhancing sustainability, and promoting climate adaptation:

1. National Solar Mission: Expanding solar power capacity to reduce dependency on fossil fuels.
2. National Mission for Enhanced Energy Efficiency: Promoting energy-efficient technologies across industries and households.
3. National Mission on Sustainable Habitat: Integrating green buildings, waste-to-energy projects, and sustainable transportation into urban planning.
4. National Water Mission: Enhancing water conservation, climate-adaptive water management, and sustainable irrigation practices.
5. National Mission for Sustaining the Himalayan Ecosystem: Addressing glacier retreat, biodiversity conservation, and climate adaptation in mountainous regions.
6. National Mission for a Green India: Increasing forest cover and carbon sequestration capacity through afforestation and ecosystem restoration.
7. National Mission for Sustainable Agriculture: Developing climate-resilient crops, sustainable farming techniques, and organic agriculture to ensure food security.
8. National Mission on Strategic Knowledge for Climate Change: Promoting climate research, policy innovation, and data-driven decision-making.

Additionally, India's Long-Term Low-Carbon Development Strategy (LT-LEDS) outlines a roadmap for achieving net-zero emissions by 2070, balancing economic growth with climate resilience. The strategy emphasizes renewable energy expansion, sustainable mobility, carbon pricing mechanisms, and public-private partnerships to drive climate action at scale.

Carbon Emission Reduction Strategies

Transition to Renewable Energy

One of the most effective ways to reduce carbon emissions is by transitioning from fossil fuels to renewable energy sources. India has made significant strides in increasing its solar, wind, and hydropower capacity to meet its climate targets. Government policies supporting clean energy infrastructure, grid modernization, and incentives for green investments are crucial for accelerating this shift.

Enhancing Energy Efficiency and Sustainable Practices

Energy efficiency plays a key role in carbon management. Initiatives such as smart grids, LED lighting, and green buildings can significantly reduce energy consumption. Industrial sectors are also adopting waste-to-energy projects, circular economy models, and low-carbon manufacturing processes to minimize their carbon footprint.

Carbon Capture, Utilization, and Storage (CCUS)

Carbon capture technologies can prevent CO_2 emissions from entering the atmosphere by storing them underground or converting them into useful products. Research into carbon utilization for cement production, biofuels, and enhanced oil recovery (EOR) is gaining momentum as part of India's long-term climate strategy.

Sustainable Transportation

The transportation sector is a major contributor to carbon emissions. Expanding electric vehicles (EVs), developing low-carbon fuels, and improving public transportation networks can help reduce emissions. Additionally, policies promoting green mobility solutions and vehicle efficiency standards will be crucial in the transition to sustainable transportation systems.

Corporate Climate Responsibility

Businesses have a significant role in climate action. Many corporations are now committing to net-zero targets, carbon neutrality, and ESG (Environmental, Social, and Governance) compliance. Companies are adopting sustainable supply chain practices, carbon accounting, and green investments to align with global decarbonization goals.

Nature-Based Solutions

Nature-based solutions such as afforestation, wetland restoration, and regenerative agriculture can enhance carbon sequestration. Expanding protected areas, rewilding degraded landscapes, and promoting agroforestry are effective ways to capture atmospheric CO_2 while preserving biodiversity.

Challenges in Implementing Climate Actions

Despite significant progress, several challenges hinder the effective implementation of carbon management strategies. These obstacles include financial constraints, regulatory complexities, technological limitations, and resistance to adopting sustainable practices:

- High transition costs for industries and developing economies moving to clean energy solutions.
- Regulatory and policy complexities that delay the adoption of carbon pricing and emissions trading systems.
- Limited public awareness and resistance to adopting sustainable practices at the individual and community levels.
- Technological limitations in large-scale carbon capture, storage, and sustainable energy distribution.

The Way Forward

To achieve a carbon-neutral future, the following actions must be prioritized:

1. **Strengthening Climate Policies**

Implementing stricter carbon regulations is essential to hold industries accountable for their emissions. This can be complemented by providing incentives for green technologies, such as tax breaks or grants, to encourage businesses to adopt sustainable practices. Additionally, establishing robust climate finance mechanisms will support developing countries in their transition to low-carbon economies.

2. **Investing in Clean Technology and Innovation**

Significant investments in clean technology are crucial for scaling up renewable energy sources such as solar, wind, and geothermal. This also includes enhancing energy storage solutions to ensure reliability and efficiency. Expanding the development of hydrogen fuel and advanced carbon capture technologies can play a vital role in reducing emissions across various sectors.

3. **Developing Public-Private Partnerships (PPPs)**

Collaborations between government entities and private companies can accelerate large-scale decarbonization projects and the development of sustainable infrastructure. By pooling resources, expertise, and funding, PPPs can tackle complex challenges more effectively and drive innovation in climate solutions.

4. Enhancing Public Awareness and Engagement

Raising public awareness is essential for building support for climate initiatives. Educational campaigns and behavioural change programs, such as Mission LiFE (Lifestyle for Environment), can empower individuals to adopt sustainable practices in their daily lives. Engaging communities in discussions about climate change and its impacts can foster a collective commitment to sustainability.

Conclusion

Carbon management and climate actions are critical to ensuring a sustainable and resilient future. By transitioning to renewable energy, improving efficiency, reducing emissions, and enforcing strong policies, nations can work collectively towards mitigating climate change. Now is the time to take decisive action and implement meaningful strategies before the effects become irreversible. Through proactive measures, global cooperation, and innovative solutions, a greener, more sustainable world can be built for future generations.

Blue Carbon: A Frontier in Climate Change Action

Ms. Manisha Lineswala
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Blue carbon is the new buzzword in the management of carbon. The term "blue carbon'' emerged in 2009 to draw attention to the vital role coastal and marine ecosystems can play in storing organic carbon. Blue carbon is the carbon captured and stored in coastal and marine ecosystems such as seagrass meadows, salt marshes, and mangroves. IPCCC defines blue carbon as "All biologically driven carbon fluxes and storage in marine systems that are amenable to management." Please refer figure 1.

Figure 1: Blue Carbon Ecosystems

Source: https://edharrison.co.uk/

Coastal and marine ecosystems typically consist of mangroves, which are tropical and subtropical forests that thrive in coastal intertidal zones; salt marshes, which are coastal wetlands that provide carbon-rich peat formation; and seagrasses, which are submerged flowering plants found in shallow marine environments. These ecosystems provide a wide range of ecosystem services, such as acting as natural barriers, reducing the impact of storm surges and erosion, purifying water, providing critical habitats for marine life, ecotourism, supporting fisheries and livelihoods, and sequestering carbon.

Although blue carbon ecosystems cover less than 2% of the ocean area, they can play a crucial role in mitigating climate change by absorbing atmospheric CO_2 and storing it in their biomass and sediments for centuries, unlike terrestrial forests. They can sequester 10 times more carbon per unit area from the atmosphere than that of terrestrial ecosystems. They annually sequester approximately 3–5% of global carbon, of which around 50% of carbon gets stored in ocean sediments.

Where Nature-based climate solutions are playing an important role for reducing greenhouse gas emissions to help achieve the Paris Agreement's goal of keeping global temperature rise below 2°C, blue carbon ecosystems (such as mangroves, salt marshes, and seagrasses) due to their exceptional carbon sequestration abilities, long-term burial of carbon in sediments, restoration potential and in addition to their wide-ranging ecosystem benefits can become an integral part of such nature based climate solutions.

However, there are several threats towards these coastal and marine ecosystems including various human activities such as aquaculture, pollution and land reclamation leading to degradation of coastal ecosystems, scientific uncertainty, lack of awareness and knowledge and community participation, lack of policy support and funds which poses a significant risk to global carbon balance and hence climate change.

Therefore, the conservation and restoration of these blue carbon ecosystems are crucial for climate change mitigation and the maintenance of the health of coastal environments. To enhance the role of blue carbon in climate action governments should incorporate blue carbon strategies into national climate policies and coastal management plans, strengthen legal protection, more investment is needed in research on studies on carbon sequestration rates and ecosystem restoration techniques, promote public-private partnerships, international collaboration to promote large scale conservation across borders, increasing public awareness and community involvement in conservation efforts to ensure long-term sustainability.

Blue carbon is a multifaceted concept that has numerous benefits. Despite their small footprint, their role remains crucial, especially in coastal resilience, biodiversity, and long-term carbon storage. However, their degradation threatens their ability to store carbon and provide ecosystem services. Through policy support, scientific advancements, and sustainable management, blue carbon initiatives can significantly contribute to global climate action.

Outreach Activities

Human Library Program (HLP)

Under the "Human Library" programme, a session on "Consumer Centricity for Innovation and Growth – The Lumière Experience," was held on 13th January 2025, presented by Ms. Deepa Soman, Founder and Managing Director of Lumière Business Solutions Pvt. Ltd., a pioneering social enterprise based in Mumbai. The lecture provided insights into the significance of consumer centricity as a driving force for innovation and business growth. It was designed to inspire participants to adopt consumer-focused strategies for achieving sustainable success. Ms. Soman's thought-provoking insights left a lasting impact, inspiring attendees to integrate consumer-centric thinking into their academic and professional pursuits.

Session by Ms. Deepa Soman, Founder and Managing Director of Lumière Business Solutions Pvt. Ltd

Student Internships

Five M.Sc. II - Biotechnology students of Pillai College of Arts, Commerce and Science (Autonomous), New Panvel successfully completed their 3-month internship under the guidance of Dr. Sangeeta Sharma at the SIES IIEM, from October 2024 to January 2025 and submitted their dissertation reports to University of Mumbai. Their Lab activities and FRAP Test Analysis were conducted the supervision of Dr. Amrita Dutta, Asst. Prof. and Mr. Kailash Jaiswar, Lab Asst., SIES IIEM.

Agreement with UNESCO:

As per our agreement with UNESCO, New Delhi, we are tasked with organizing the production, installation, and utilization of a permanent exhibition of 27 Climate Science Literacy posters by June, 2025.

Student Visits to SIES IIEM

As part of our efforts to raise awareness about the courses and initiatives at SIES IIEM, we had the pleasure of hosting student visits from two esteemed institutions. These visits provided an excellent opportunity to highlight our work at SIES IIEM and engage with the next generation of scholars. The primary objective of this visit was to familiarize students with state-of-the-art research facilities, introduce them to key environmental projects, and offer insights into the scope and significance of Environmental Management as a field of study and career path. The visit also aimed to strengthen academic collaboration and encourage student engagement in sustainability initiatives. Additionally, this visit sought to strengthen academic partnerships and promote knowledge sharing between institutions. Faculty members and students engaged in meaningful discussions and interactive sessions on the topics of sustainability, environmental conservation, and the latest advancements in green technology, thus making these visits valuable learning experiences.

- On 6th February 2025, we hosted 31 students and 2 faculty members from the Department of Chemistry at St. Xavier's College (Autonomous), Mumbai.
- On 27th February 2025, we hosted 25 students and 5 faculty members from SIES College of Arts, Science, and Commerce (Empowered Autonomous), Sion (W), Mumbai.

Expert sessions were conducted by Dr. Sangeeta Sharma, Dr. Suman Rani and Dr. Amrita Dutta, who provided students with valuable insights into various environmental management initiatives. Furthermore, Dr. Manik Rathod, and Mr. Niranjan Sanzgiri, the faculty members from St. Xavier's College; and, Ms. Shraddha Patil, Mr. Prathamesh Kulkarni, Ms. Rutuja Nighot, Dr. Sharvari Kudtarkar, Dr. Surabhi Mishra from SIES College of Arts, Science, and Commerce played an integral role in making the visit interactive and informative.

Faculty & Students of St. Xavier's College (Autonomous)

Faculty & Students of SIES College of Arts, Science, and Commerce (Empowered Autonomous), Sion (W),

Events

Prakkathan 2025

SIES IIEM successfully hosted Prakkathan – 2025, our Annual Ecofest, themed Planet 2.0: *ReImagine, ReSet, ReStore!* Students, faculty members, and industry experts came together to engage in thought-provoking sessions and competitions aimed at fostering environmental awareness and action. The event proved to be a dynamic and impactful event, promoting awareness and action towards environmental sustainability. The competitions and interactive sessions encouraged students to develop innovative solutions and fostered a collaborative learning environment.

Inauguration & Memorial Lecture: The event commenced with the *Prof. Purushottam Khanna Memorial Lecture* delivered by Mr. Yusuf Kabir, a distinguished Water Supply, Sanitation, and Hygiene Specialist and the Focal Point for Climate, Environment & Emergency Response at UNICEF India, Mumbai.

The lecture, titled "Climate Smart Communities and Resilient Social Services" focused on building resilience in service delivery for essential child survival and development interventions such as., water supply, nutrition, education, health, and sanitation amidst the challenges posed by climate variability and extreme climate hazards.

Competitions & Activities: Various interactive events such as, *Climate Change & Health Impact Games* were conducted which included activities that illustrated real-world environmental challenges.

Poster Making Competition: Students creatively expressed their ideas on sustainability and environmental conservation.

Business Pitch Competition: Participants presented innovative business solutions for environmental sustainability.

Interactive Session by WeNaturalist: The WeNaturalist team led a brainstorming session where students devised creative solutions for pressing environmental concerns, showcasing their ability to think critically and innovatively.

Prakkathan – 2025 proved to be The event strengthened industry-academia ties, provided networking opportunities, and laid the groundwork for future sustainability initiatives at SIES IIEM. The success of Prakkathan – 2025 is attributed toy the enthusiastic participation of students, faculty, and industry partners. Our sincere gratitude goes to our sponsors, NICHEM Solutions and Enviro Policy Research India Pvt Ltd (EPRI), for their generous support. Moving forward, we aim to build on the momentum of this event by organizing more initiatives that inspire sustainability-driven innovation and action.

Faculty & Student Achievements

Top Achievers in M.Sc. SDEM Program - Batch 2022-2024

We are happy to announce the exceptional accomplishments of two students who have emerged as the top achievers in the M.Sc. Sustainable Development and Environment Management (SDEM) program (Batch 2022-2024), affiliated to University of Mumbai-Garware Institute of Career Education and Development. These outstanding students have demonstrated academic excellence, commitment, and dedication to sustainability and environmental management. We are incredibly proud of their success and look forward to seeing them continue to make meaningful contributions to the world of sustainable development.

Ms. Saraswathy Bai P

First Rank

Ms. Nidhi Sanjay Darade

Second Rank

Ph.D. Admissions (Environmental Sciences):

The interviews for selecting candidates for the Ph.D. Program in Environmental Sciences (2024-2025) were held on January 15, 2025. In accordance with university norms, three candidates were selected for admission to the program for AY 2024-2025.

Faculty Development Workshops / Conference Participation

- Dr. Sangeeta Sharma attended the SIES Institutions -Performance Management Cycle-24-25 Program held for all HoIs and IQAC coordinators at SIES Sion West Campus on 24th January 2025, organized by HR, SIES.
- Dr. Sangeeta V. Sharma moderated a session on "The Future of Corporate Sustainability: Bridging the Gap between ESG & Climate Goals, part of the International Management Research Conference 2025 (IMRCSIES-25) on 15th February, 2025, organized by SIES School of Business Studies at SIES College of Management Studies, Nerul, Navi Mumbai
- Dr. Sangeeta V. Sharma participated as Speaker in Episode # 5 of the Podcast "Join! The Textile Revolutionary Movement" on 26th February, 2025, organized online by Ms. Irene, Founder & CEO of In Joy Vintage Sustainable Fashion, United Kingdom.
- Dr. Sangeeta V. Sharma participated as Esteemed Speaker for the ETEducation TechEDU Mumbai held on the 6th March 2025, Sahara Star Hotel, Mumbai,- themed "Building a Smart Education Ecosystem with Technology." The Panel Session was "Mega Panel 6: Tech-Driven Quality Assurance: Redefining Academic Excellence."

Glimpses

India's Progress Towards Climate Resilience

7.93% Drop in GHG Emissions

According to India's latest Biennial Update Report (BUR-4), the country's total greenhouse gas (GHG) emissions in 2020 stood at 2,959 million tonnes of CO2 equivalent, excluding Land Use, Land-Use Change and Forestry (LULUCF), with the energy sector being the largest contributor at 75.66% of emissions; when including LULUCF, the net emissions were 2,437 million tonnes of CO2e, representing a 7.93% decrease compared to 2019. Between 2016 and 2019, emissions from this sector grew by an average of 3.72 percent annually (Down to Earth, Jan 2025). The energy sector, the biggest contributor to India's GHG emissions, is followed by agriculture at 13.72%, industrial processes and product use (8.06%), and waste (2.56%).

Press Information Bureau (PIB), MoEFCC, Jan 2024

MoEFCC's Report Card for Year 2024

- India achieved the Milestone of Planting 102 Crore Trees Under the 'Ek Ped Maa Ke Naam' Campaign, aiming for 140 Crore by March 2025
- Ministry notified the Eco-mark Rules on 26th September 2024
- National Clean Air Programme (NCAP) hit Milestones: 40% PM Reduction in 23 Cities, ₹11,200 Crore fund allocated for Pollution Control; PRANA Portal launched for Real-Time Air Quality Monitoring
- MISHTI launched on World Environment Day 2024 to Restore Mangroves and Boost Coastal Sustainability
- Approx. 22,561 Hectares of Degraded Mangroves restored in 13 States/UTs and ₹17.96 Crore released for the restoration of 3,836 Hectares in 6 States/UTs
- Biological Diversity Rules, 2024 Notified on 22nd October 2024
- 125 Projects sanctioned in 2024-25 under Nagar Van Yojana, with ₹106.38 Crore released to 9 States/UTs; Second installment of ₹26.40 Crore for 86 Projects released in 4 States/UTs
- Tiger Reserves in India rose to 57; Two New Tiger Reserves were notified in 2024: Guru Ghasidas-Tamo Pingla Tiger Reserve and Ratapani Tiger Reserve
- 13 beaches across 6 States and 3 Union Territories certified with Blue Flag Certification for the season 2024-2025
- UNEA adopted a Resolution on Sustainable Lifestyles based on the precepts of Mission LiFE
- India hosted the 3rd Voice of Global South Summit on 17th August 2024 with the overarching theme 'An Empowered Global South for a Sustainable Future'
- India conducted the first-ever Ganges River Dolphin Tagging
- India State of Forest Report (ISFR) 2023 Released: Forest and Tree Cover reach 8,27,357 sq.km., accounting for 25.17% of India's Geographical Area

Press Information Bureau (PIB), MoEFCC, December 2024

SIES Indian Institute of Environment Management
RISE WITH EDUCATION

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Articles, photos etc. are invited for next issue (April - June 2025)

Theme:

"Powering the Future: Sustainable Energy Transition in India"

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