

Newsletter Theme: Transforming Actions Towards Net Zero: Policy Frameworks and Other Tools



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From Director’s Desk



At global level climate change is one of the most important agenda for discussion in environmental domains. The climate change is a broad phenomenon that requires management with multi-dimensional approach for reduction in carbon emission, conservation of natural sinks, technology for mitigation, implementation of policies and engagement of different stakeholders. Moreover, it requires an integration of different policies to address the complex issues related to climate change.

Natural resources and biodiversity are paramount in providing resilience to the impacts of climate change and maintaining the ecosystem stability that is very important for environmental sustainability. The ecosystem-based approach has been integrated in the policy framework of Convention on Biodiversity (CBD) in 1992 for management of resources and biodiversity for their equitable conservation and utilization. In 2016 International Union for Conservation of Nature (IUCN) has come up with the framework for Nature Based Solution (NbS) that are the action-based approach to protect, manage, and restore ecosystems. In COP 26 the NbS was promoted for converging solutions for biodiversity conservation and climate change management. The government of India had announced ‘Panchamrit’ and ‘LIFE- Lifestyle for Environment’ for achieving climate targets of net zero by 2070 in COP 26.

The current issue of newsletter is deliberating on the concepts of NbS, Panchamrit and LIFE for understanding their concept in converging the focus of climate change actions towards meaningful and sustainable solutions.

Dr. Seema Mishra



Net Zero Transformation for *AatmaNirbhar Bharat* Enabling Pathways for Innovation / Growth / Jobs

Manu Maudgal

Head- Corporate & Philanthropic Engagement
Shakti Sustainability Foundation, New Delhi

Context

Climate change is the greatest challenge of our times. The Intergovernmental Panel on Climate Change (IPCC) has recommended that the world must reach zero carbon emissions by 2050, to ensure that global average temperatures do not increase by more than 1.5 degrees Celsius above pre-industrial levels.

For India, climate change is here and now, with over 80% of India's districts vulnerable to climate change. More Indians are vulnerable to negative climate and extreme weather events than any other nationality. It is in India's self-interest to make development choices that provide sustainable prosperity to its people and aid the global urgency to meet the 1.5 °C challenge.

It is in this context, as part of its "*panchamrit*" pledge at COP 26, India announced a net zero goal for 2070. Net zero means a state in which the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere. In the coming years, Parliament, each ministry, and state government shall define the annual carbon budgets needed to reach net zero by 2070 and follow through with policies, actions, and their enforcement through necessary state capacity for monitoring and compliance.

When your dreams are big, your resolve is big, and therefore endeavours should also be bigger.

AatmaNirbhar Bharat is a mass movement of society, essential to make India a developed nation in the next 25 years.

We must resolve to take it forward.

PM Modi Independence Day Speech

15 August 2022

No country has achieved sustainability and prosperity simultaneously. Developed countries first became prosperous and are now moving towards a more sustainable economy. In the short / medium term this shall create socio-economic risks that could impair the transition itself.

India's net zero pathway would be a pioneering uncharted territory.

Net Zero Ramification

For India, the Net Zero goal announcement by 2070, presents both immediate (2030), medium term (2047) and long-term (2070) economic growth opportunities. The zero-carbon, inclusive development model calls for the largest green transformation in the world, wherein all sectors of the economy will decarbonize, upending established markets and create new ones.

Empirical studies estimate that net zero pathways are better for India compared to business-as-usual pathways. The economic logic is simple. Green technologies drive high-productivity growth in the economy and result in higher GDP growth, higher job creation, and lower energy imports, while reducing carbon emissions and air pollution¹. Achieving the net zero objective requires a whole economy transition, requiring un-precedented access to finance and recourse to better technological solutions.

Globally, there is an estimated capital need of \$1-2 trillion per annum through 2050². The net zero transition capital requirements for India alone are estimated around \$50 billion per annum through 2050.

AatmaNirbhar Bharat for Net Zero

For India's youth entering the workforce today, India 2047 especially holds the clear promise of progressive economic transformation, simply because the tenure for the better part of their careers shall be governed by the national consensus on climate change, its tangible impact on our

lives and new market demands.

Structural changes in the energy economy are required to explore commercially viable non-fossil technology solutions, including energy storage to serve the needs of a resilient and streamlined power infrastructure. With public finances weak and govt. debt increasing, private sector spending is expected to shoulder the leadership in delivering innovative, low-carbon solutions, while the Government is expected to facilitate and guide the execution.

The *Aatmanirbhar Bharat* Mission and underlying measures such as the National Policy for Advanced Manufacturing, Coastal economic zones, Production Linked Incentive schemes (PLI), Development of Industrial corridors / Parks, Phased manufacturing programme, are steps taken in this regard. *Aatmanirbharta* promises to raise the share of manufacturing sector in India's gross value added to 25% by 2030 from around 15% today. Manufacturing is expected to emerge as a potential exporter of goods worth over \$1 trillion by 2030³.

There are risks. With un-mitigated climate risk, *Atmanirbhar Bharat* faces profound human and economic consequences⁴, which can constrain industry growth and innovation and impact job creation.

The private sector would be ill-placed to address the political economy issues surrounding job creation, including regional and gender disparity, competitiveness driven shifts in demand

Aatmanirbhar Bharat and Net Zero priorities how to get there:

1. How it impacts businesses and supply chains?
2. How can India achieve technology leadership?
3. How do we manage social transitions?
4. How do we safeguard communities to climate change?

¹ India's Decisive Decade, Shri Jayant Sinha, Shaping Our Green Future, ORF, Nov 2021

² Investment Needs of a 1.5°C World, Bloomberg NEF, August 2022

³ The Economist newspaper, May 2022

⁴480 out of 612 districts in India, India Voluntary National Review 2020, Niti Aayog

and supply and bring alignment of disconnected actors/ strategies.

Charting the net zero course would require technology, ingenuity, and intent. It has been observed that some nations and geographic regions seem to be hotbeds of creative entrepreneurship and economic growth, while others remain innovation laggards. Two ingredients essential to innovation success are creative interaction in-between youth and entrepreneurship.

To unleash the full potential of India's *aatmanirbharta* initiative, it is imperative to catalyze start-ups for climate innovations and develop corporate partnerships which can scale such innovations for improved jobs and economic growth.

Academia (and the underlying student youth base) is uniquely positioned to nurture such creative interaction. Over next two decades, India's working population is set to increase from 800 million to over 1000 million, to become the world's largest.

Academia-business platforms for facilitating dialogue between business and youth driven climate innovations / start-ups can be utilized to scale net zero innovations for improved jobs and economic growth.

Conclusion

With Net Zero as a goal, India brings a huge advantage, in attracting technology and finance for creating green infrastructure. This growth can support India's ambitious decarbonization goals and raise overall standard of living.

Academia can actively facilitate India's transition by focused efforts surrounding a few big net zero ideas that can unleash innovation at scale and speed.

Example, enable cleaner energy future through the delivery of knowledge and capacity outcomes.

These outcomes, especially co-designed with private sector, can support job creation and enhancing baseline skills (education, training) for the millions expected to enter the workforce especially women.

In the years leading to the centenary of independent India (2047), Public-Private-Academia partnerships can support to catalyze and accelerate India's socio-economic potential.

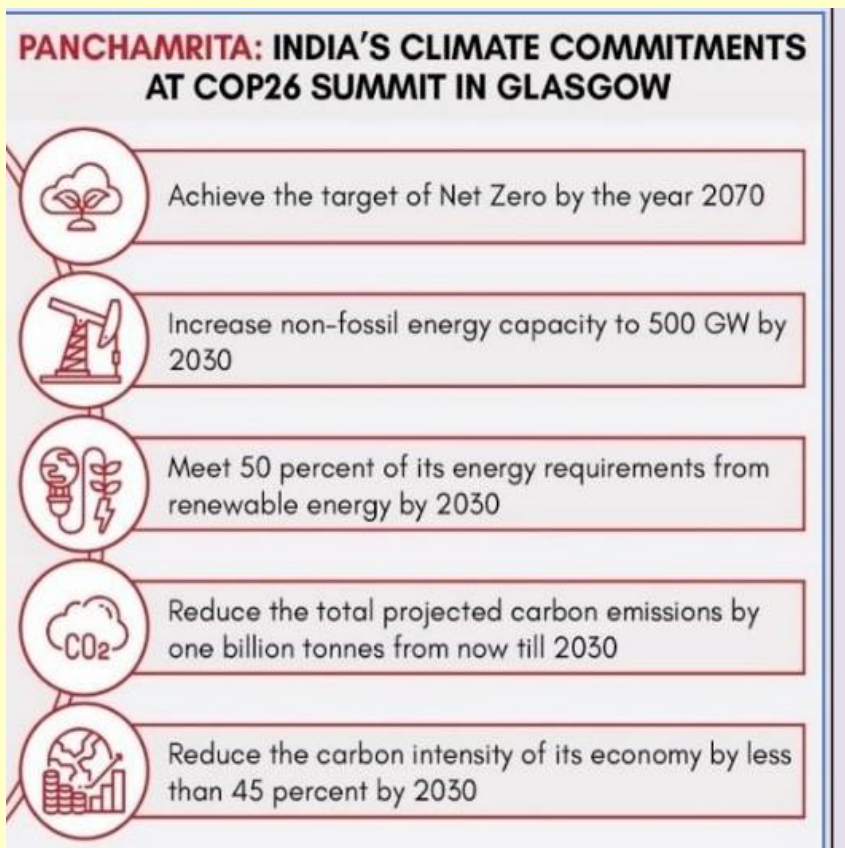
Disclaimer:

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Launch of B. Sc. EVS course with SIES College of Arts Science and Commerce, Sion (W), Mumbai (Autonomous College) in Hybrid Mode under NEP 2020 from 2022- 2023





SIES IEM organized a two-day training programme on ‘Applications of GIS and Remote Sensing in environment Management for M. Sc. And Ph. D. courses on 15th & 16th July

2022





SIES Indian Institute of Environment Management

Centre For Monitoring of Surface Water Bodies

Physical Characterization	Temperature, Colour, TS, Turbidity	
Chemical Characterization	pH, EC, Salinity, Alkalinity, Magnesium Hardness, Carbonates & Bicarbonates, Phosphate, Nitrate, Ammonical Nitrogen, Sodium, Potassium, Calcium, Heavy Metals, BOD, COD, DO	
Biological Characterization		
Total Bacteria, Total Fungi, Fecal coliform, <i>E. coli</i>	Biomonitoring Phytoplankton, Zooplankton, Benthic Invertebrate	Indexing Saprobity Index, Diversity Index



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Integrating Nature Based Solutions in Climate Change Policy Framework: Challenges and Opportunities

Seema Mishra

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The global average temperature in 2022 is estimated to be 1.15 (1.02 to 1.28) °C above the 1850 – 1900 average. From 2015 to 2022 eight warmest years were reported in last one decade. The concentration of carbon di oxide, methane and nitrous oxide continued to increase in atmosphere during 2022. The extreme heatwaves in European countries or melting of the Alps glacier between 3 - 4 m in 2022 in comparison to 2003 are matter of concern for present and future generations. In the east African nations, last four wet seasons were continuous drought with related socio – economic challenges that is longest in last 40 years.

India has also observed a rise in extreme temperature and rainfall events, droughts, sea level rise and an increase in the severity of cyclones alongside other changes in the monsoon system (Min. of Earth, 2021). The weather extremes have an alarming impact on different resources and biodiversity that

is affecting the resilience of ecosystems for climate change adaptation and mitigation. This advocates for far – reaching and transformative actions for restoration and conservation of resources and biodiversity for ecosystem stability.

Ecosystem and Nature Based Approach for Halting Climate Change

The ecosystem-based adaptation (EbA) (UNFCCC, 2008; CBD, 2009) and Nature Based solutions (NbS) (MacKinnon et al., 2008; IUCN, 2009, 2014, IPCC, 2021) are extensively promoted at different platforms for integrating in policy framework for climate change adaptation and mitigation. The EbA defined as the use of biodiversity and ecosystem services in overall adaptation strategy in participatory approach. However, the EbA concept is considered as a narrow concept because it focusses on only climate change adaptation not on mitigation.

Nature Based Solutions (NbS) are “actions to protect, sustainably manage and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”

IUCN, 2016

The NbS highlights the importance of natural resource and biodiversity conservation for climate change adaptation and mitigation. It is considered as an umbrella term for integrating various policy frameworks, technological solutions, financial mechanisms, and participation of different stakeholders in climate change adaptation, mitigation, and biodiversity conservation.

NbS are a powerful tool to facilitate and catalyse the engagement of cross-sectoral stakeholders to join towards the implementation of an ambitious Post-2020

Global Biodiversity Framework (GBF) and move towards achieving the CBD 2050 Vision of ‘Living in harmony with nature’. NbS also offer a pathway for synergies among several multilateral environmental agreements, including for biological diversity (CBD), climate change (UNFCCC), disaster risk reduction (Sendai Framework), desertification (UNCCD) and the wider Sustainable Development Goals (SDGs) – and for mainstreaming nature conservation into sectoral decision-making processes.

Diagram 1: Significance of Nature Based Solutions in Climate Change Adaptation and Mitigation

Climate Change Adaptation	Climate Change Mitigation
<ul style="list-style-type: none"> • Reduction in climate risks eg. extreme heat, wildfire, drought, inland flooding, coastal floods and shoreline erosion, stormwater, and sewer overflow • Improved water and air quality • Biodiversity and ecosystem conservation • Yield improvement • Resilient infrastructure • Job opportunities • Community development and income generation • Aesthetic and cultural benefits 	<ul style="list-style-type: none"> • Reduce GHG emission • Enhanced carbon storage • Reducing energy demand

Nature Based Solutions in Climate Change Adaptation

Climate change adaptation is defined as the adjustment in natural or human systems such

as wetland areas in response to actual or expected climatic risks or their effects viz. wildfires, drought, extreme heat, coastal inundation, and inland flooding. Climate

change adaptation strategy should moderate, harm, or exploit beneficial opportunities of climate change.

In coastal areas plantations along the shoreline support coastal habitat, recreation, access to nature and promoting aquaculture. These solutions will effectively support in adapting to the crisis of climate change.

Nature Based Solutions in Climate Change Mitigation

Climate change mitigation refers to efforts to reduce emission of greenhouse gases. The strategies for climate change mitigation include reduction in greenhouse gas emissions and sources for enhancing greenhouse gas sinks means using new technologies, utilization of renewable energy, improving energy efficiency etc. that will also be useful in corporate net zero strategy. The prevention of degradation, loss and damage of natural ecosystems are most cost effective and immediate in comparison to reduction in emission from degraded ecosystems. The protection and restoration of ecosystem favours in the mitigation of climate change. Unsustainable production and consumption pattern requires proper management for improving the mitigation opportunities. Nature based solutions have immense scope in reducing carbon change mitigation. Reforestation, agroforestry practices and use of biochar in improving

soil fertility are some of the significant examples for climate change mitigation.

Identification and Implementation of Nature Based Solutions in Climate Change Policy Framework

Sector based identification and implementation of NbS is very important for any country for achieving the targets of NDC in time. The NbS are critical in halting loss and damage of ecosystems and climate crisis. It is important for countries to identify major climate risks, pertinent solutions and accordingly develop a gap identification report for developing sustainable strategies for climate change adaptation and mitigation. In COP 26, the enhanced focus on the implementation of NbS was observed with commitment to halt and reverse deforestation by 2030 and to achieve net zero.

The ENACT (Enhancing Nature Based Solutions for Accelerated Climate Transformation) initiative was launched during COP 27 to bring coherence to and strengthen collaboration between existing NbS efforts and partnerships. The initiative is expected to provide comprehensive development in the areas of NbS implementation and its positive impacts on climate transformation. In CBD COP 15, recently conducted at Montreal nearly 200 countries agreed and adopted 'Global

Biodiversity Framework’ to ensure and enable that by 2030, at least 30% of land and sea areas are effectively conserved and managed through ecologically representative, well connected and equitably governed systems of protected areas and other areas-based conservation measures. These conservation methods are promoting NbS only. Further, ‘Decent Work in Nature Based Solution’ is jointly launched at same platform by ILO, UNEP and IUCN that develops a robust framework for the

evaluation of employment from NbS. The Indian government has also emphasized on biodiversity conservation through promotion of NbS especially traditional wisdom.

Despite of positive commitments by parties at different platforms, still lot of challenges are there for successful implementation of NbS. The major challenges and opportunities in the implementation of NbS in climate change adaptation and mitigation are as below:

Challenges	Opportunities
Lack of field base and long-term scientific knowledge of NbS on climate change adaptation and mitigation	<ul style="list-style-type: none"> • Identification of traditional NbS for regulating the impacts of climatic variability and as well as risks, evaluation of field performance after upscaling, dissemination of knowledge and its adoption.
Valuation of natural capital is in nascent stage	<ul style="list-style-type: none"> • The work on the valuation of natural capital is already promoted by different nations after signing on aichi biodiversity targets under CBD. Its important to establish linkages of different policy frameworks and get multiplier effects.
Policies on NbS are not well defined in integrated manner	<ul style="list-style-type: none"> • The areas emphasized under UNFCCC COPs 26 & 27 and CBD COP 15 will support in linking NbS with economic viability and job creation for climate change adaptation and mitigation.
Paucity of funds for the implementation of NbS	<ul style="list-style-type: none"> • It is estimated that US \$133 billion/year is required for effective implementation of NbS, out of that only 14% is from private sector

	and 86% from public sector funds and subsidies. However, private sector contribution for NbS is very important for climate transformation. The linkages between private and public funding with green bonds, credit swaps, carbon markets may support in improving the implementation process of NbS.
Confusion in private sector in the implementation of NbS	Private sectors considers that many benefits and co benefits from implementation of NbS are public goods. By improving the tools for NbS implementation and linkages between policy frameworks related to UNFCCC, CBD and SDGs may develop interests of private sector in promoting Nbs in their operations.
Lack of awareness among different stakeholders	<ul style="list-style-type: none"> • By sharing the benefits of NbS in climate change adaptation, mitigation, and biodiversity conservation, its implementation may be improvised.

The NbS are important tools for effective implementation of Nationally determined contribution (NDCs) to combating climate change and its effects. A close coordination between public and private agencies will help in realizing the objectives of NbS. The offsets generated by implementation of NbS

may be purchased by private sector as a part of its pathway towards net zero in accordance with social and environmental safeguards with strong yet flexible policy framework.

Dr. Seema Mishra has delivered invited lecture on the topic, ‘Urban sustainability and Climate Resilience: Challenges, Opportunities and Solutions’ in International Symposium on same topic organized by the School of Industrial Technology, Universiti Sains Malaysia, Penang, Malaysia on 14th June 2022

Report on International Webinar on the topic, ‘Only One Earth: Sustainable Actions for Environment’ on 7th June 2022



SIES Indian Institute of Environment Management
Organizes
International Webinar on Topic
“Only One Earth : Sustainable Actions For Environment”
Date : 7th June 2022 Time : 3.00 pm to 5.00 pm

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Dr. Murali Krishna Gurram
Consultant
University of Singapore
Topic - "Dynamics of Urban growth vis-à-vis Micro-climate - Remote Sensing & GIS and Water-balancing"

Mr. Avinash Kumar
Executive Director
Earthood Services Pvt. Ltd.
Topic - "Latest Trends in Net Zero and Carbon Offset Programmes Across the World"

Mr. Ashish Gupta
DGM
Bharat Petroleum Corporation Ltd.
Topic - "Zero Waste to Landfill"

The institute has organized international webinar on the topic, ‘Only One Earth: Sustainable Actions for Environment’ on 7th June 2022 to deliberate on sustainable technologies and policy frameworks related to environment management. Dr. Murali Krishna Gurram has delivered his lecture on the topic, ‘Dynamics of urban growth vis a vis microclimate- remote sensing & GIS and water balancing’ in that his focus on the monitoring and mapping of different water resources and urban facilities to develop and water budget for balancing water demand and supply. He presented different models developed by using different micro climatic parameters and GIS through remote sensing models that will support in planning and management of urban areas of Hyderabad city.

Mr. Avinash Kumar presented on the topic, ‘Latest trends in net zero and carbon offset programmes across the world’ in that he covered current perspectives in climate change policy framework, the net zero targets and sustainable pathways to achieve them. He discussed on the significance of science-based targets for corporate sectors in achieving net zero with focus on suitable offsetting standards.

The last lecture of the webinar was delivered by Mr. Ashish Gupta, DGM, BPCL on the topic, ‘Zero Waste to Landfill’ wherein he presented on the efforts taken by Bharat Petroleum Corporation Ltd. developing zero waste from different operational process, its monitoring, verification, validation, and certification process for achieving the target.

Around 45 participants were registered in the webinar from different universities, institutions and industries.

Some glimpses from the International Webinar



Industrial Visit of M. Sc. SDEM students to learn Eco restoration Activities at Sanjay Gandhi National Park, Mumbai on 15th September 2022 with iNaturewatch Foundation



Report on the Events Organized During Azadi Ka Amrit Mahotsav

To celebrate and commemorate the Azadi Ka Amrit Mahotsav during 75th year of independence, the institute has organized following events with SIES School of Packaging on 13th & 15th August 2022. The institute was decorated by the students on the theme of Independence Day.



The day wise activities are as below:

13th August 2022

Mr. Bhalchandra Mahajani, President, Rotary Club, Navi Mumbai and Ms. Suma Nair, Head. SIES CTD have graced the occasion and evaluated the poster competition.

1. Quiz Competition

A quiz competition was organized by the M. Sc. SDEM students for the students of SIES SOP mainly on the theme of freedom struggle, general and environmental awareness.



2. Poster Making Competition

The students have participated in poster making competition on the theme Rural India @75 that was given by the students of SIES SOP.



Participation of Alumnus on 13/08/2022

Ms. Mohana Naidu, alumnus M. Sc. SDEM 2017- 2019 graced the occasion and addressed the students.



15th August 2022

The institute has participated in the flag hoisting programme with SIES GST.



A cultural programme was organized with SIES SOP. The students of SIES IIEEM have presented medley of songs on national integration and a mime on environmental challenges.



Participation of Ex. Staff Member and Alumni in Events

Ms. Amruta Diwan Dixit, Ex. Staff member (served institute from 2006- 2014) has graced the event. Dr. Ketna Matkar, alumna PGDSEM course batch 2017- 2018. Ms. Pritika Matkar and

Ms. Amruta Phukan, alumni M. Sc. SDEM course batch 2020- 2022 were present during the event. They have addressed the students and presented the awards.



Industrial Visits of B. Sc. EVS and M. Sc. SDEM Students to Indian Meteorological Department, Colaba, Mumbai (M. S.)



Industrial Visit of M. Sc. SDEM to Jawaharlal Nehru Port Trust, Mumbai



Report on National Webinar on “Transformative Actions Towards Net Zero: challenges and Opportunities” on 3rd September 2022

SIES Indian Institute of Environment Management
Organizes
National Webinar on
“Transformative Actions Towards Net Zero: Challenges and Opportunities”

Date : 3rd September 2022 Time : 2.30 pm to 4.00 pm

SPEAKERS

Mr. Manu Maudgal
Shakti Sustainable Energy Foundation
Topic - “Net Zero Transformative Action for AatmaNirbhar Bharat”

Ms. Nikita Parab
Mahindra & Mahindra Ltd.
Topic – “Green Building - A tool for Sustainable Development and Advancing Net Zero”

Registration is Free

Registration Form Link : <https://forms.gle/MK-J8j2cA/K6TNNr5>

Certificates will be provided for registered participants

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SIES IIEM has organized National Webinar on “Transformative Actions Towards Net Zero: challenges and Opportunities” on 3rd September 2022 to sensitize students about the transformative actions towards sustainable environment management. Mr. Manu Maudgal deliberated on the India’s policies for achieving net zero and its interlinkages with popular programmes developed by government to achieve overall sustainability. He emphasized that transformative actions for achieving net zero are the need of an hour that require a defined pathway with strong policy framework for its effective implementation.

Ms. Nikita Parab has focused her lecture on ‘Green Building – A Tool Towards Sustainable Development and Advancing Net Zero’ wherein she reviewed all the policy frameworks and standards related to green building.

A Report on the Visit to IFAT India on 29th September 2022 to learn about the new technologies in environment management



Participation of Dr. Seema Mishra, director SIES IEM in a panel discussion on the topic, 'Changemakers: Women Leaders Driving Sustainability' on 29th September, 2022



Faculty members and students of M. Sc. SDEM visited IFAT India on 29th September 2022

Environment in News Headlines

Environment in News

Plant Based Lignocellulosic Material Can Remediate Per and Polyflouroalkyl (PFA) Substances

PFAs are complex chemicals to degrade because they are composed of chains of carbon and fluorine. White rot type of fungus is known to degrade PFAs but sustaining its growth and promoting degradation is difficult. In research conducted at Carnegie Mellon University lignocellulosic material from plants with white fungus was found to be very effective in improving the degradation of PFAs.

Environmental Factor, September 2022

Methane Blast in Baltic Sea

On 27th September 2022, two unusual leaks of natural gas pipelines in Baltic Sea raised a concern about the impacts. Many times, these leaks are not accidental, they occur due to routine maintenance. Scientists measuring methane from satellite in space have found that methane emissions from oil and gas operations are usually twice what companies reported.

Environment, September 2022

India Updates Its NDCs to Tackle Climate Crisis

India has formally updated its nationally determined contribution (NDC) to fight climate change, confirming to the United Nations apex body that it will reduce the emissions intensity of its Gross Domestic Product (GDP) by 45% from 2005 levels by the year 2030, and to have installed capacity for non-fossil fuel-based power sources equivalent to the country's 50% requirement by 2030. NDC has also stated that India will put forward LIFE-Lifestyle for environment as a mass movement.

Hindustan Times, August 2022

Eleven New Wetlands Declared as Ramsar Sites in India

In 2022 five new wetlands have been declared as Ramsar sites. So, total 75 wetland sites are of international standard are nominated in India.

MOEFCC, August 2022

Bacteria may Help in Degrading Lake Plastic Waste

A study conducted by University of Cambridge has reported that plastic waste releases carbon material that supports in increasing bacterial growth. The team has observed that bacteria grew faster in lake water containing plastic waste in comparison to control and concluded that bacteria may grow at faster rate in a lake containing faster rate and support in its degradation. This will also change the food chain of the lake ecosystem.

University of Cambridge, July 2022

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Dr. Seema Mishra

Articles, photos etc. are invited for next issue (October - December, 2022) of the Newsletter on the theme "Sustainable Environment Management".