

Vol.11 Issue 1, January - April 2026



Newsletter of the

DIVECHA CENTRE FOR CLIMATE CHANGE

Open Day 2026

Training programme on climate change and health

FE World Wetlands Day workshop

India's path to reliable clean power



Indian Institute of Science
Bengaluru
www.iisc.ac.in



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FROM THE CHAIR

Greetings!

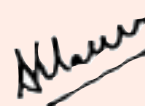


On Saturday, 12th December 2015 an historic agreement was signed in Paris by 195 countries. The goal of the agreement was to reduce greenhouse gas emissions rapidly so that the increase in global mean temperature can be limited to below 2oC above the pre-industrial value. The Montreal protocol to limit the emission of Ozone depleting gases was successful because the commitments we are rebinding not voluntary. The Paris agreement, on the other hand, was not binding. Hence one must depend upon the voluntary commitment from each nation to reduce their greenhouse gas emissions.

During the past 10 years the global mean temperature has continued to rise and has reached 1.5°C above the pre-industrial value during the last 3 years. The world has been pre-occupied with three regional wars and hence further progress to reduce greenhouse gases has not been undertaken. The progress during the past 10 years to reduce greenhouse gas emission has not been good. There was temporary decline in greenhouse gas emissions in 2020 on account of the COVID pandemic, but emission bounced back in 2021. In 2015 the greenhouse gas emission was around 49,000 million tonnes while in 2024 it was 53,000 million tonnes. There was around 8% increase in greenhouse gas emissions during these ten years.

Although the greenhouse gas emissions have not declined in the recent year there has been a lot of progress in adoption of renewable energy technology in power generation. In India the installed capacity of renewable energy systems increased by 175 Gigawatts from 2014 to 2025. China's installed capacity of renewable energy increased by 1000 Gigawatts from 2014 to 2025. The global installed capacity of renewable energy increased by 3500 Gigawatts from 2014 to 2025. These data indicate that the electrical power production has begun the transition away from the use of fossil fuels. A similar transition must occur in the transportation industry. In major industries such as steel, fertilizer and cement this transition is much more difficult. Let us hope that other industries will follow the example set by the power industry.

S. K. Satheesh





Prof. J. Srinivasan, Distinguished Scientist, DCCC, conducting the quiz programme on “Climate and Environment” on open day.

The Indian Institute of Science (IISc) Open Day 2026 was a vibrant and inspiring event that brought science closer to the public, reflecting the institute’s long-standing commitment to research, innovation, and outreach. This year the annual event was held on 7 March 2026 from 9:00 AM to 5:00 PM at its sprawling Bengaluru campus.

The event welcomed thousands of visitors, including school students, college aspirants, educators, and science enthusiasts from across the state. The Open Day, traditionally organized every year to commemorate the birth anniversary of the institute’s founder, offers a rare opportunity for the general public to explore one of India’s top scientific institutions and interact directly with researchers and faculty members.

The 2026 edition at Divecha Centre for Climate Change (DCCC), featured a wide array of activities designed to make complex scientific ideas accessible and engaging. The faculty, staff and students of DCCC also exhibited a number of experiments, posters and organised quiz programs for the visitors. There was the quiz programme on “Climate and Environment” at the DCCC auditorium conducted by Prof. J. Srinivasan, Distinguished Scientist, DCCC, and Mrs. Kavitha Devi Ramkumar, Principal Project Consultant, DCCC. Prof. Dr. H. Paramesh, Visiting Scientist, DCCC conducted

a quiz on “Health and Environment”. Dr. Manjari Manisha, Scientist, DCCC conducted a quiz on “Climate Change, Sustainability and Forests”. The Aerosol Lab demonstrated live experiments on “Measurement of soot/black carbon particles”, and “Measurement of particulate matter (PM) particles”. They displayed posters on “Aerosols measurement and instrumentation”, “Black carbon from urban and rural region of India”, and “Basics of atmospheric aerosols”. The Future Earth team had put up posters on “Eat Healthy”, “Millets of India”, “Pollution and Health”, “Soil Map of India”, “10 New Insights into Climate Science” and “Food System Change”. They presented a demo on “BMI Calculator”. The Agroecosystem team demonstrated experiments on “Balance v/s Bloom: Impact of nutrients on ecosystem”, “Small Bites, Big Impact: How Food Choices Affect Climate”, and “What’s Really in Our Food?”. They displayed posters on “Millets and food security”. They also conducted a mini quiz and activity session for school children.

The Water Quality Lab displayed posters on “Emerging pollutants in groundwater - Examples from Karnataka”, “Climate change, over exploitation of groundwater and desertification”, and “Role of perennial lakes in sustainable water supply in rural India”. The Energy Policy team demonstrated on “Does climate change affect us all the same!?”. Glacier Lab presented posters on “Effect of Climate Change on Glaciers”, “Glacier Lake Outburst Floods” and a model showing various glacier features. Students presented demo on “AI/ML Forecast model’s hands-on simulations”, and “Speleothems as climate archives”. They presented posters on “Corals: Living archives of climate (with display of coral samples)” and “Vertebrate fossil” display.

The atmosphere throughout the campus was energetic and intellectually stimulating, with crowds eagerly moving between stalls, demonstrations, and lecture halls. The event drew large numbers of visitors, all keen to learn and engage with science in an approachable way. Overall, IISc Open Day 2026 successfully fulfilled its purpose of bridging the gap between scientists and the public, promoting scientific temper, and inspiring the next generation of innovators.



Visitor viewing experiments and posters on open day at DCCC



Open Day at DCCC

TRAINING PROGRAMME ON CLIMATE CHANGE AND HEALTH



Participants of the training programme on climate change and health held on 13-14 March 2026.

The Divecha Centre of Climate Change, IISc. organized the fifth edition of the comprehensive two-days training program for the health professionals entitled “Health in A Changing Climate: Empowering Health Professionals” on 13th and 14th March 2026. This certificate-based training program, organized by Prof. S.K. Satheesh, Prof. Dr. H. Paramesh, Mr. Raj Kishore Singh, Dr. Rohini Mattoo and Dr. Sushu Kadanakuppe, aimed to equip health professionals and educators with the knowledge and skills needed to address health risks linked to climate change.

Prof. Dr. H. Paramesh highlighted how this program started to train the health professionals who were not aware of the W.H.O NGO Global Health Community Conference of Parties (COP-26) in Glasgow in 2021, where 10 health issues were adapted by W.H.O and UN., 75% of the physicians were lack of knowledge on Environmental health. From last year we encouraged the health promoters from other professionals institutions.

Health professionals play a crucial role in protecting communities from the growing health impacts of climate change. There is an urgent need for them to assess risks, implement interventions, and enhance public awareness through effective communication (WHO). Recognizing that this responsibility extends beyond healthcare, the program now welcomes professionals from various fields to foster interdisciplinary collaboration

and maximize its impact.

The program opened with insightful sessions delving into air, water, soil pollution and natural disasters and their impact on respiratory health, neonatal well-being, and disease risks, along with climate-driven health challenges like memory loss, rural health vulnerabilities, and disaster impacts. The guest speaker, Dr. Soumya Swaminathan former deputy director of the World Health Organization, delivered a talk on “Heat waves and its impact”.

Dr. Joshitha Sankam, Project Officer Loss and Damage and Health representing UNEP from Copenhagen Denmark Loss and Damage and Health spoke on “A Non-Economic Loss and Damage Perspective”. Experts also addressed loss and damage for health sector, impact of climate change on cryosphere, importance of forest and wetlands on health, climate impact on memory loss, oral health, nasal health, sound and light pollution, and microplastic pollution, emphasizing mitigation measures and adaptation strategies. Scientists and doctors delivered in-depth presentations, outlining the scientific basis, key data, and health risks of each topic, along with their community impact.

The second day of the program featured brief 15 min lightning talks and interactive workshops, covered topics such as emerging environmental health concerns, including AI in healthcare, biodiversity and its impact on health, importance of green spaces, climate change impact on nutritional values of food, environmental impact on physical disabilities and obesity. A quiz on the basics of atmospheric science, conducted by Prof. Dr. Paramesh H, received enthusiastic appreciation from all participants. This was followed by group activity where the participants collaborated in groups, analysed real-world scenarios, and presented their insights, fostering meaningful discussions and practical solutions.

Overall, this training programme was an impactful and interactive experience, giving participants an awareness on the climate-related health challenges and empowering them to act.

FE WORKSHOP: WORLD WETLANDS DAY



Participants of the world wetlands day workshop held on 6th February 2026.

The Future Earth Global Secretariat Hub South Asia, DCCC, organised a World Wetland Day workshop on 6th February 2026. The workshop brought together researchers, policymakers, practitioners, civil society representatives, and domain experts to discuss emerging scientific evidence, governance challenges, and policy opportunities for wetland conservation in India. The event aimed to bridge science–policy gaps and identify actionable recommendations for improved wetland management and climate-responsive planning.

The central theme of the talks was the urgent need to evolve climate action from simply identifying problems to actively developing solutions, a mission embodied by the “Future Earth” initiative, especially given the grim reality of crossing 400 ppm of CO₂ and the difficulty of limiting warming to 1.5°C. Within this context, wetlands were highlighted as critical ecosystems for achieving climate resilience, acting as vital carbon sinks and buffers against climate vagaries like floods and storms, which threaten to undo developmental gains. A key insight was the immense value of traditional knowledge, particularly the sustainability of historical practices—such as creating chains of small, community-managed village ponds where revenue was tied to land productivity—compared to the ecological impacts of modern, large-scale reservoirs. The way forward, therefore, lies in a practical integration of this ancient wisdom with contemporary science and technology, as demonstrated by successful projects rejuvenating

water bodies by combining modern pumping schemes with the traditional concept of distributing water to village-level lakes. Ultimately, the message was a call to protect ecosystems by bridging the gap between past and present to ensure food security and a climate-resilient landscape.

The deliberations of the workshop emphasised the fundamental ecological and evolutionary significance of wetlands, highlighting their role as critical transitional ecosystems that enabled the evolution of life from aquatic to terrestrial environments. Wetlands were described as biodiversity hotspots supporting aquatic, terrestrial, and amphibious life simultaneously, making them among the most productive ecosystems on Earth. Despite occupying nearly 5% of the global geographical area, wetlands store close to 30% of soil carbon, positioning them as vital natural carbon sinks and indispensable components of global climate mitigation strategies. The address underscored that degradation of wetlands could release substantial stored carbon, potentially undermining broader climate mitigation efforts across sectors. The discussion further traced the evolving understanding of climate change—from earlier concerns limited to sea-level rise and coastal submergence to the present recognition of widespread ecological and economic disruptions affecting agriculture, livelihoods, and regional economies. Evidence from past disasters, including coastal protection offered by mangrove ecosystems during extreme events, reinforced wetlands' role as natural buffers against climate-induced hazards. Encouraging progress was noted in the increasing recognition and identification of wetlands under national and international frameworks, including the expansion of Ramsar-designated sites and large-scale wetland mapping initiatives in Karnataka, where nearly 14,906 wetlands have been identified for protection and monitoring under judicial oversight. The address also called for a shift in global and national narratives toward recognizing wetlands as economically valuable climate infrastructure, advocating incentive-based mechanisms, compensation frameworks, and market-linked approaches to reward ecosystem conservation.

Finally, it stressed the importance of translating scientific deliberations beyond academic forums into public awareness, policy engagement, and governance action to ensure long-term protection and sustainable management of wetlands as essential systems for ecological resilience and human well-being.

FE WEBINAR: ENERGY RESOURCE, ENVIRONMENT AND BUDGET 2026

Dr. Sruthi Subbanna, Project Scientist III, DCCC, participated in the webinar on energy resource, environment and budget 2026 held on 7th February 2026. She presented a comprehensive analysis of India's environmental budget allocations and expenditure patterns for 2026-27. Dr. Subbanna emphasized critical concerns including under-utilization of allocated funds emphasizing on the need for improved spending efficiency and stronger research-policy in order to achieve environmental sustainability.

FE SEMINAR: INDIGENOUS KNOWLEDGE SYSTEMS AND CLIMATE CHANGE



Dr. Sruthi Subbanna, Project Scientist III, DCCC, participating in the panel discussion on indigenous Knowledge Systems and Climate Change: Reframing Evidence, Practice, and Power held on February 28th 2026.

A Tribal Dialogue titled “Indigenous Knowledge Systems and Climate Change: Reframing Evidence, Practice, and Power” was convened at the District Science Centre in Purulia, West Bengal. Dr. Sruthi Subbanna was part of the panel discussion at the event on “Climate Change, Livelihood, Water and Way Forwards – Asia Science Mission”. She elaborated on the impact of climate variability on livelihoods, and the need for involving local communities in such discussions. Through the dialogue with other panelists including Dr Ram Avtar, Associate Professor, Faculty of Environmental Earth Science, Hokkaido University, Japan; Ms. Kate Nairn, Head of Future Earth Australia (FEA), Future Earth, Australia; Mr. Nirmallya Mandoll, Director- ECOTIATE and moderated by Amitaksha Nag, Director, Datamuse, the discussions aimed to foster interdisciplinary discussions, amplify indigenous voices, and identify pathways for integrating traditional knowledge systems with scientific research and policy frameworks.

FE SOUTH ASIA MARINE SOCIAL SCIENCE CONFERENCE, SRI LANKA



Mr. Prashanth R., Senior Research Associate, DCCC, participating in the Marine Social Science Conference South Asia, in University of Ruhuna, Sri Lanka held from 18-22 March 2026.

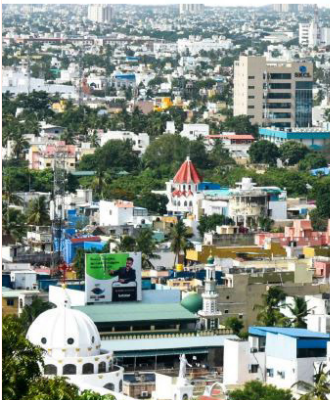
Mr. Prashanth R., Senior Research Associate, DCCC and Science Officer at Future Earth South Asia attended the Marine Social Science Conference South Asia, in University of Ruhuna, Sri Lanka from 18-22 March 2026 jointly organised in collaboration with the University of Jaffna, Sri Lanka and the Centre for Maritime Research, University of Amsterdam, Netherlands. The conference provided a platform for interdisciplinary dialogue on the rapid transformations occurring along the coastlines of South Asia bringing together researchers and practitioners working on coastal and marine issues across the world.

Mr. Prashanth presented his abstract titled “Socio-Ecological Transformations and Coastal Commons under Unplanned Development Pressure in Coastal Karnataka, India.” The presentation highlighted the changing nature of coastal commons under increasing unplanned developmental pressures and their implications for resource-dependent communities. The conference provided important insights into region-specific concerns such as coastal erosion, sea-level rise, salinity intrusion, marine pollution, and habitat degradation, including the loss of mangroves and nearshore ecosystems. Discussions also focused on fisheries decline, changing species distribution, and the implications of expanding infrastructure such as aquaculture etc. Overall, the conference facilitated constructive dialogue on balancing development and sustainability, while strengthening regional understanding of socio-ecological challenges in South Asia’s coastal and marine systems.

FE SCIENCE AWARENESS WEBINAR

Science Awareness Webinar 15

urban



Register



<https://url-shortener.me/DG00>

11:00 - 12:30 (IST)
27th March 2026

Context Setting



ZEENAT NIAZI
Chief Advisor, Climate Resilience & Circular Economy,
Development Alternatives, Research Scholar-TERU SAS
Steering Member TERU SAS

futurearth
Research. Innovation. Sustainability.



WEBINAR

Cities Navigating Environmental Change

enabling south asian cities to mitigate and adapt to climate change while addressing biodiversity loss and developmental challenges

Our Speakers



DR. HARINI NAGENDRA
Ecologist, Professor of Sustainability
Azim Premji University



DR. VISHAL NARAIN
Professor of Public Policy and Governance
Management Development Institute (MDI)



DR. PERRINE HAMEL
Technologist, Assistant Professor
Asian School of the Environment, NTU

Co-Chairs



DR. KENSUKE FUKUSHI
Environmental Engineer,
University of Tokyo,
Institute for Future Initiatives



DR. H. PARAMESH
Pediatric Pulmonologist, Visiting
Physician Scientist, Divecha Centre for
Climate Change, IISc



Announcement of the webinar on “Cities Navigating Environmental Change: Enabling South Asian cities to mitigate and adapt to climate change while addressing biodiversity loss and developmental challenges” on 23rd March 2026.

The Future Earth Global Secretariat Hub South Asia, DCCC in collaboration with Future Earth Urban Knowledge Action Network, hosted a webinar on “Cities Navigating Environmental Change : Enabling South Asian cities to mitigate and adapt to climate change while addressing biodiversity loss and developmental challenges” on 23rd March 2026. The three speakers for the webinar Dr. Harini Nagendra, Ecologist, Professor of Sustainability, Azim Premji University, Dr. Vishal Narain, Professor of Public Policy and Governance, Management Development Institute (MDI), and Dr. Perrine Hamel, Technologist, Assistant Professor, Asian School of the Environment, NTU, all spoke about their respective research in the area and the existing goals.

As urbanization accelerates, cities have become the primary stage for the social, economic, technological, and institutional transformations needed to build a just and resilient planet. However, rapid growth often drives environmental degradation, disrupting biogeochemical cycles

and exacerbating vulnerabilities and creating new challenges such as unprecedented flooding and extreme heat. Understanding the systemic nature of these crises and designing strategies and solutions to manage urban challenges in the context of a changing climate remains the top priority for global urban science.

Dr. Harini's talk was based on two decades of research on the importance of lakes, parks and wetlands in Indian cities. Her talk focused on the insights emerging from research work on urban ecology in the rapidly growing city of Bengaluru, and other large Indian cities like Kolkata, Mumbai and Delhi. She showcased the importance of urban ecosystems for resilience to climate change in South Asia, focusing on the nexus of "biodiversity-water-climate" to maximize ecological and environmental multifunctionality of land-use, enhancing greenery and reducing climate impacts at the local level. She also highlighted how the South Asian cities contribute to the reduction of biodiversity loss and habitat fragmentation at regional scales, and the lessons provided by strong human-nature relationships, which can be of use to other cities in both the global south and north.

Dr. Vishal Narain talked on peri-urban spaces, that combine features of rural and urban environments, and are rapidly growing in geographical spread and significance in South Asia in particular, and in the global south in general. Rural-urban boundaries are fast blurring. "rural development" and "urban planning" are losing their significance as dichotomous approaches or as lenses to look at climate vulnerability and resilience. What does a peri-urban perspective bring to our understanding of the city? His talk focused on the unique vulnerabilities of peri-urban spaces to climate change; vulnerabilities that get compounded by the loss of access to natural resources and livelihoods and weakening social capital. The peri-urban space is one of immense social and economic heterogeneity. This necessitates the use of a lens of intersectionality in identifying most vulnerable individuals and communities. Ethnographic research that documents these processes of transition is necessary to identify weaknesses or lacunae in governance and the role of social and power structures in allocating natural resources. Action research based on partnerships among government, academia, NGOs is necessary to build local adaptive capacity while creating forums where peri-urban communities can hold service providers accountable.

Dr. Perrine Hamel's talk focused on nature-based solutions in informal settlements in Asia-Pacific. Nature-based solutions (NbS) are gaining global attention as approaches to address climate, environmental, and social challenges. At the same time, social housing programs play a critical role in strengthening urban resilience by improving living conditions for low-income populations, particularly in rapidly urbanizing regions. Yet, questions remain about what types of NbS are most appropriate and meaningful in low-income urban communities, including informal settlements and formal social housing contexts. He showed several years of research from the resilient and inclusive cities lab to explore these questions. He highlighted insights from a systematic review of NbS applications in informal settlements across the Asia-Pacific region, highlighting current trends, gaps, and contextual constraints. He presented interdisciplinary research conducted with academic collaborators in Bangkok, focusing on the Baan Mankong ("secure housing") upgrading program. This work examines how suitable NbS can be identified and designed by considering governance structures, social capital, and residents' values and beliefs. Dr. Hamel argued that moving beyond one-size-fits-all approaches to NbS requires grounding interventions in local social and institutional realities. The findings from Bangkok offer transferable lessons for other cities across Asia, demonstrating how NbS can be better aligned with community priorities and capacities to support more inclusive and resilient urban development.

Overall, the webinar concluded that building resilient cities in South Asia requires moving beyond purely technical solutions toward integrated approaches that combine ecological restoration, inclusive governance, and community participation, while acknowledging the diverse social and environmental realities of the region.

The poster is for a webinar titled "Transdisciplinary Research in Action Across Asia" held on 23 March 2026 at 3:00 PM at the SEARCA Drilon Hall, Los Baños, Laguna. It is part of the SEARCA Agriculture & Development Seminar Series. The background features a pattern of green palm fronds. The poster lists six speakers:

- Keynote Framing Talk:**
 - DR. RIA LAMBINO**, Research Institute for Humanity and Nature, Japan
- GAIA Country Experiences:**
 - DR. SIWATT PONGPIACHAN**, National Institute of Development Administration, Thailand
 - DR. BALT SUVDANTSETSEG**, Mongolian Academy of Sciences, Mongolia
- Case Presentation:**
 - DR. PERCY SAJISE**, Senior Fellow, SEARCA
 - DR. HEIN MALLEE**, Kyoto Prefectural University, Japan
 - DR. SRUTHI SUBBANNA**, Divecha Centre for Climate Change, India

At the bottom, it includes the hashtag #SEARCAADSS, a registration link qrco.de/23Mar, and a photo credit to Kotoboo.

Announcement of the webinar on “Transdisciplinary Research in Action Across Asia” held on 23rd March 2026.

Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)’s, Agriculture and Development Seminar Series (ADSS) on “Transdisciplinary Research in Action Across Asia” was held on 23 March 2026 in hybrid mode at the SEARCA Drilon Hall, Los Baños, Laguna, in Philippines.

This session presented global and regional case studies on transdisciplinary in action, as part of SEARCA-hosted Co-designing Trainer’s Training on Transdisciplinary (TD) Approaches Workshop for the Gearing up and Applying Inter and Transdisciplinary Skills in Asia (GAIA) initiative funded by the Asia-Pacific Network for Global Change Research (APN). During the session, Dr. Sruthi Subbanna, Project Scientist III, DCCC, presented her work on bamboos and its socio-economic and ecological significance in Peninsular India while also highlighting more recent transdisciplinary research work being in Purulia, West Bengal.

INDIA'S PATH TO RELIABLE CLEAN POWER



Dr. Anasuya Gangopadhyay, Senior Associate, CSTEP, giving her talk on “From fossil foundation to firm futures - India’s path to reliable clean power” on 18th March 2026.

The Divecha Centre for Climate Change organised a seminar on “From fossil foundation to firm futures - India’s path to reliable clean power” on 18th March 2026 by Dr. Anasuya Gangopadhyay, Senior Associate, CSTEP. India is transitioning from fossil fuels to reliable clean power by prioritizing Firm and Dispatchable Renewable Energy (FDRE), as a solution that combines solar, wind, and battery storage. FDRE can deliver reliable, 24/7 power, making it a key contender to replace future coal capacity additions.

The question is how India can ensure round-the-clock, reliable power as electricity demand rises and delivering on climate commitments becomes increasingly urgent. It matters not only for meeting climate goals, but also for securing affordable electricity, reducing import dependence, and building a resilient power system for a fast-growing economy. Union Budget 2026–27 marks a pivotal moment in India’s energy transition by shifting attention from renewable capacity expansion to the bigger challenge of grid integration and reliability. With 50% non-fossil installed capacity in June 2025 and an additional 34.95 GW (approx.) in FY26, India’s clean energy story is now entering its delivery phase. Firm and dispatchable renewable energy (FDRE) plants, which combine renewables with standalone storage, are one of the tools that can help in addressing the grid integration challenges. The cost gap between FDRE and new

pit head coal plants has been one of the core bottlenecks that has so far slowed FDRE's uptake. Drawing on the IISD–CSTEP report, 'Budgeting for Net-Zero', published in December 2025, her talk highlights why FDRE's current cost disadvantage is temporary, how system design and storage can bring in parity with coal, and why the macroeconomic gains in GDP and employment make grid-ready renewables central to India's growth strategy. While solar PV and battery storage (BESS) are gaining cost parity, other technologies like offshore wind require significant government support (e.g., INR 9,000 crore/GW) to match thermal power, according to IISD (International Institute for Sustainable Development) reports.

Dr. Anasuya's talk concluded by highlighting the report's insights and explored what kinds of future government support measures may be required for India to meet its clean energy and energy security goals. The talk also aimed to bring together diverse voices to understand the trade-offs, look at what the power system really needs, and identify what India should prioritize, both now and in the future, as it scales up clean energy and whether India may benefit from alternative approaches as its energy markets continue to grow and evolve.



Participants at the event.

FE WORKSHOP: WASTE MANAGEMENT AND CIRCULAR ECONOMY



(Left to right) Prof. S. K. Satheesh, Chair, DCCC , Shri. Gaurav Gupta, Additional Chief Secretary, Government of Karnataka, Dr. Raj Kishore Singh, Visiting Scientist, DCCC, and Shri. Srinivasalu, Principal Secretary, Ecology and Environment, Government of Karnataka presiding the inaugural session of the workshop on “Waste management and circular economy” on 22nd April 2026.

On the occasion of Earth Day 2026, the Future Earth Global Secretariat Hub South Asia, DCCC, in collaboration with the Environmental Management and Policy Research Institute, organised a one day workshop on “Waste management and circular economy” on 22nd April 2026. The event brought together policymakers, scientists, practitioners, and industry stakeholders to deliberate on pathways for transitioning from a linear to a circular economy.

The workshop opened with remarks by Prof. S. K. Satheesh, who underscored the urgency of addressing climate change, noting that global temperatures have already crossed 1°C of warming. He emphasized the need to limit warming to 1.5°C, while highlighting gaps in global commitments, particularly in climate finance and policy prioritization. Linking the discussion to the Earth Day 2026 theme, “Our Power, Our Planet,” he called for accelerated adoption of renewable energy and stronger environmental protection measures, alongside India’s goals of achieving net-zero emissions and expanding non-fossil fuel capacity.

In the keynote address, Shri. Gaurav Gupta, Additional Chief Secretary, Government of Karnataka, highlighted the growing relevance of circular economy approaches in urban governance and energy systems. He pointed to Bengaluru's efforts in recycling construction and demolition waste and emphasized the rise of clean-tech startups. A major challenge, he noted, lies in energy storage, which remains critical for scaling renewable energy despite advances in solar power. He also discussed waste-to-energy initiatives and stressed the need for innovation, infrastructure, and policy support.

Shri. Srinivasalu, Principal Secretary, Ecology and Environment, Government of Karnataka highlighted that circular economy principles mirror natural ecological cycles. He noted that Karnataka generates approximately 13,000 tonnes of waste daily, presenting significant opportunities for resource recovery. With effective recycling, composting, and wastewater reuse, the state could unlock an estimated ₹10,000 crore annual economic potential. He emphasized the need to recognize recycling as a formal industry, promote investments, strengthen regulatory systems, and integrate self-help groups into waste management.

Dr. Ram Prasath Manohar V., Chairman of the Bangalore Water Supply & Sewerage Board, emphasized treating sewage as a resource, citing wastewater reuse initiatives such as the KC Valley project. He highlighted the importance of treating wastewater not just as a by-product, but as



Dr. Raj felicitating Dr. Ram Prasath Manohar V., Chairman of the Bangalore Water Supply & Sewerage Board, at the event.

a resource. At Bengaluru Water Supply and Sewerage Board (BWSSB), he and his team are working towards converting sewage into value, through initiatives such as producing compressed bio gas from treated wastewater and promoting its reuse. They are also exploring partnerships to scale this effort, with the potential to generate additional revenue while strengthening sustainable waste management. Treated water is being supplied to lakes and regions such as Kolar and Chikkaballapur, supporting agriculture and improving water availability for local ecosystems. At the same time, with Cauvery water sourced from over 100 km away it is equally important to focus on responsible water usage and avoid wastage. Sustainable water management requires both system-level innovation and collective responsibility.

Closing the inaugural session, Dr. Raj Kishore Singh emphasized that while circular economy concepts are rooted in traditional practices, modern consumption patterns have weakened these systems. He called for actionable insights to bridge gaps in governance, technology, and implementation, highlighting the critical role of startups and interdisciplinary collaboration.

This was followed by technical session talks by invited speakers who provided diverse perspectives on advancing circular economy and best practices for bridging policy, practice, and innovation. Shri. J. Chandra Babu stressed the importance of regulatory frameworks such as Extended Producer Responsibility (EPR) in improving accountability and recycling efficiency. Prof. Jagannatha Venkataramaiah emphasized lifestyle changes and the revival of traditional sustainable practices such as decentralized resource management and biogas systems. Ms. Ramamani V. K. highlighted Bengaluru's waste management challenges (6,500 tonnes/day), stressing segregation, decentralized processing, and behavioural change. Shri. Sampath C. M. discussed the evolution of policy frameworks, noting that implementation gaps, weak governance, and limited community participation remain key barriers. Dr. H. N. Chanakya highlighted the need for nutrient recovery, decentralized reuse systems, and policy innovation in wastewater management. On innovation and industry engagement, Ms. Ritika Gandhi discussed corporate-supported innovation and the role of startups in scaling circular solutions. Dr. V. H. Sangeetha addressed plastic waste challenges, emphasizing improved recycling technologies, biodegradable alternatives, and awareness. Shri. Pushkara S. V. introduced

the “city–farmer partnership” model, linking urban organic waste with agricultural use through decentralized composting.

This was followed by a panel discussion highlighting a critical gap between industrial efficiency and urban waste management systems. Panelists emphasized that circular solutions must align with local economics and user needs, decentralized and data-driven systems are essential, and technology is available, but institutional coordination and behavioral change remain key barriers.

While industries adopt economically driven recycling practices, urban local bodies face challenges of scale, coordination, and behavioural diversity. Innovations such as digital tracking, aggregation platforms, and link workers were identified as promising tools to improve efficiency and scale.

The workshop concluded with a strong consensus that advancing circular economy practices requires integrated action across policy, technology, institutions, and society. While India has made progress in regulatory frameworks and innovation, effective implementation will depend on decentralization, stakeholder collaboration, and sustained behavioural change. By aligning environmental sustainability with economic opportunities, circular economy approaches can play a transformative role in addressing India’s waste management challenges while supporting climate goals.



Participants at the event.

CAPACITY BUILDING



A meeting was held with Dr. Meenakshi Negi (*Centre*), Principal Chief Conservator of Forests (Head of Forest Force – HOFF), Karnataka Forest Department (KFD), on 9th April 2026 at Divecha Centre for Climate Change to discuss possible research and capacity building collaborations with DCCC and KFD.



Prof. Dr. H. Paramesh has been honoured a fellowship by the Karnataka Science and Technology Academy (FKSTA) at U. R. Rao Academy Convention Centre on 13th Jan 2026. The award was presented to him by the Hon'ble minister for Science and Technology, Government of Karnataka, Shri. N. S. Bose Raj, for his work on respiratory illness and environment pollution.

RESEARCH HIGHLIGHTS

SECURING INDIA'S WATER FUTURE USING TREATED WASTEWATER

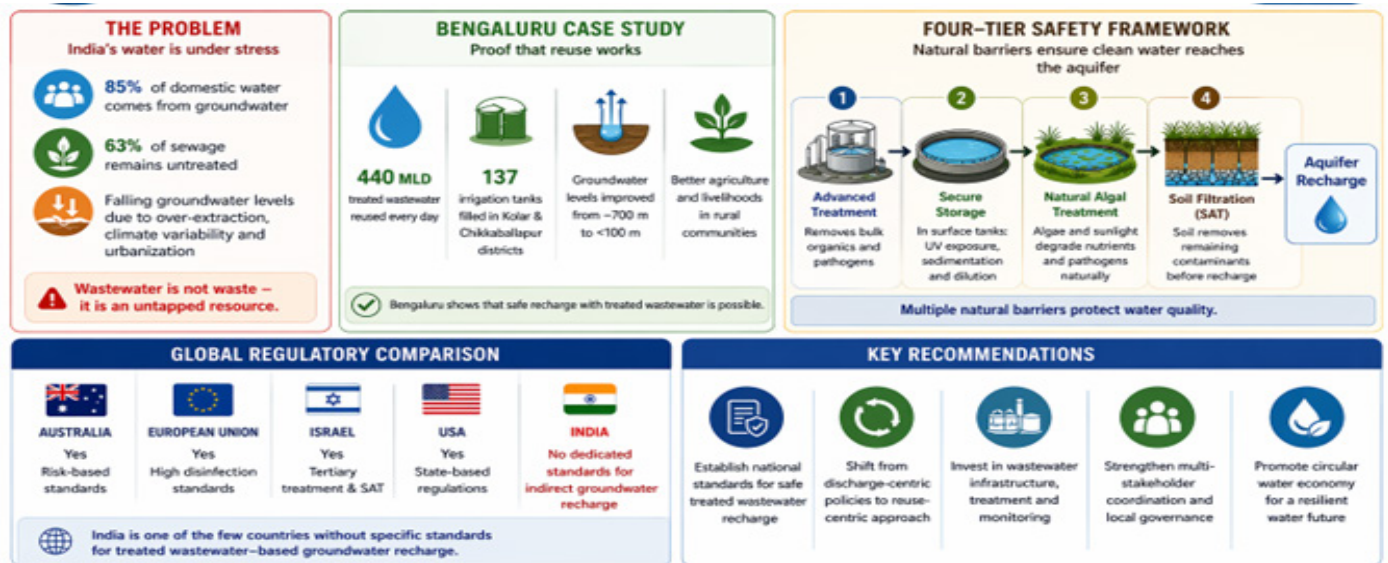


Fig: The graphical abstract including problem context, Bengaluru case study, 4-tier safety framework, and key recommendations.

There is a need in India to establish standard for the use of treated wastewater (TWW) to combat water scarcity. In many countries standards exist for TWW-based direct and indirect groundwater recharge. India's current regulatory approach is not well aligned with its tropical climate. High temperatures and diverse soil types enhance natural microbial degradation. Hence stringent standards adopted in cold countries is inappropriate. India lacks specific standards for indirect groundwater recharge. This paper proposes a four-tier safety framework comprising wastewater treatment, storage, algal consortia exposure, and soil passage that has the potential to improve contaminant removal, particularly for chemical pollutants. Evidence from Bengaluru demonstrates the feasibility of large-scale TWW reuse for indirect groundwater recharge to achieve standards set by the Central Pollution Control Board with demonstrated hydrological, social, and economic benefits. The findings suggest aligning water quality targets for surface tanks used in groundwater recharge, as primary health risks are associated with skin contact rather than ingestion. The paper calls for increased investment in upstream infrastructure, stronger multi-stakeholder coordination, and community participation, rather than relying solely on increasingly stringent end-of-pipe standards that are often impractical for existing treatment systems.

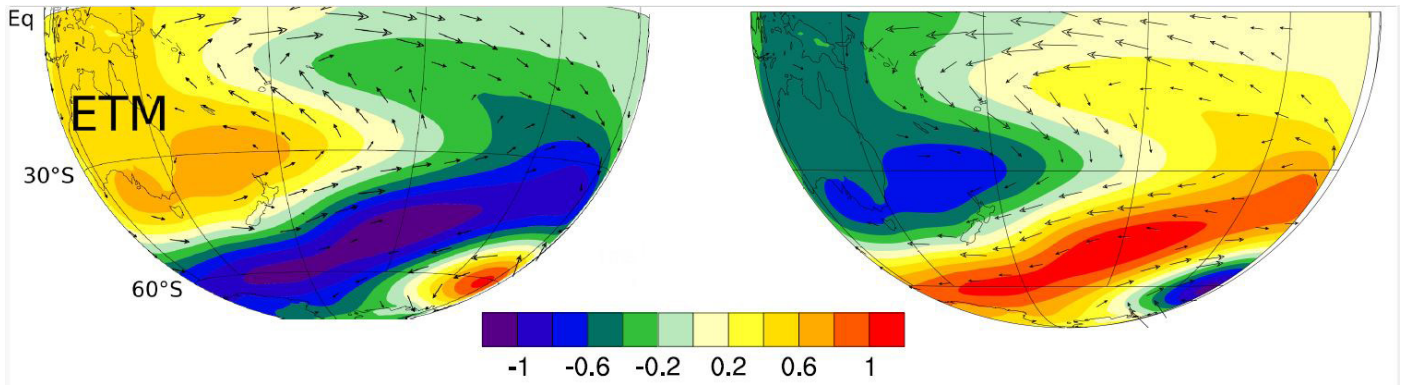
Reference: Manisha, M., Verma, K., Chanakya, H. N., Mohan Kumar, M. S., & Rao, L. (2025). Securing India's Water Future Using Treated Wastewater: A Need for Groundwater Recharge Standards. *Water Resources*, 52(5), 1011-1033.

UNRAVELLING THE TELECONNECTIONS: SOUTHERN HEMISPHERE ENSO TRANSITION MODE AND THE GLOBAL BOREAL SUMMER MONSOONS

The El Niño–Southern Oscillation Transition Mode (ETM), a distinct mode of multidecadal climate variability that originates in the Southern Hemisphere and is marked by a seesaw in boreal spring sea-level pressure over the southern Pacific near the date line. Using observational datasets and atmospheric general circulation model simulations, the study shows that ETM plays a key role in shaping ENSO’s seasonal transition and exerts a strong influence on global climate, particularly on boreal summer rainfall. During the positive phase of ETM, the Northern Hemisphere— especially the North Pacific—tends to cool, while the Southern Hemisphere warms, with pronounced warming over the southern Indian Ocean. This pattern establishes an unfavorable interhemispheric sea surface temperature (SST) gradient that alters equatorial winds, weakens the cross-equatorial atmospheric mass flux, and reduces the strength of the Intertropical Convergence Zone (ITCZ), thereby suppressing rainfall over major monsoon regions such as South Asia and the Sahel. The study decomposes the ETM signal into different time periods and uses a general circulation model to understand their role in global climate. Results demonstrate that ETM significantly modulates Northern Hemisphere monsoons at multidecadal time scales. While ETM also exhibits interannual variability, its dynamically important impacts on SST, circulation, and rainfall emerge primarily at multidecadal scales. Additional experiments with reversed SST anomalies indicate enhanced rainfall over the Indo-Sahel region, though the response is nonlinear and not simply the inverse of the positive phase. Overall, the study highlights the pivotal and previously underappreciated role of Southern Hemisphere climate variability in regulating interhemispheric temperature gradients, cross-equatorial circulation, and low- frequency monsoon variability, underscoring the need to incorporate such processes into interpretations of observed monsoon trends and long-term climate prediction.

Reference:

Srivastava, Shikhar, Arindam Chakraborty, and Raghu Murtugudde, 2026: Unravelling the Teleconnections: Southern Hemisphere ENSO Transition Mode and the Global Boreal Summer Monsoons, *Journal of Climate*, 39, 861-874, doi: <https://doi.org/10.1175/JCLI-D-25-0611.1>, <https://caos.iisc.ac.in/faculty/arch/etm/index.html>



1) Positive ETM in spring favors anomalous westerlies in equatorial Pacific.

2) Supports increase in Nino3.4 SST anomalies from boreal winter-to-summer.

3) Suppresses rainfall over Indo-Sahel by weakening Hadley circulation and ITCZ.

1) Negative ETM in spring favors anomalous easterlies in equatorial Pacific.

2) Supports decrease in Nino3.4 SST anomalies from boreal winter-to-summer.

3) Enhances rainfall over Indo-Sahel by strengthening Hadley circulation and ITCZ.

