



5TH INTERNATIONAL CONFERENCE ON SUSTAINABILITY EDUCATION

September 19 & 20, 2023
India Habitat Centre
New Delhi, India

**SOUVENIR AND
ABSTRACT VOLUME**

**THEME: EDUCATING
FOR CLIMATE ACTION
AND SUSTAINABILITY**



5TH INTERNATIONAL CONFERENCE ON SUSTAINABILITY EDUCATION

Theme:

EDUCATING FOR CLIMATE ACTION & SUSTAINABILITY

19-20 September, 2023

Venue: India Habitat Centre, New Delhi, India

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Contents:

About ICSE 2023	Page 3
Messages	Page 5
Profiles of Key Dignitaries	Page 7
Program Schedule	Page 17
Concept Notes for Sessions and Plenaries	Page 25
Abstracts of Contributed Papers and Posters ...	Page 48
Post-Conference Nature Trail	Page 81

About ICSE 2023

Background

Climate change is one of the greatest challenges that humanity is facing today, causing extreme weather and climate catastrophes such as rising sea levels, melting glaciers, more frequent and intense disasters, and loss of biodiversity etc. In view of enormity of the adverse impacts of climate change, countries have reached an agreement to take urgent steps to limit the temperature rise below 1.5°C under the Paris Agreement in 2015. However, the recent IPCC Assessment Report (2023) has highlighted the unprecedented scale of the challenge required to keep warming to 1.5°C due to a continued increase in greenhouse gas emissions. The report underscores the need for education to galvanize urgent action by all the stakeholders, governments, civil society, businesses as well as general public to address the global climate crisis and achieve sustainability.

The pace and scale of what has been done so far, and current plans, are insufficient to tackle climate change. Therefore, it has become critical to educate about the enormity of the climate crisis and to take meaningful action to address on an urgent basis. This is also in line with the Goal 13, 6 and many other goals of SDGs, the India's New Education Policy 2020 and Mission Life of Government of India.

Education for climate action is critical because it can raise awareness and understanding of the causes, impacts, and solutions of climate change. Education can empower communities to take action, by providing them with the knowledge, skills, and motivation to reduce their carbon footprint thus promoting sustainable behaviour and lifestyles. To encourage collective action in order to address the global challenge of climate change, Mobius Foundation is organising the 5th International Conference on Sustainability Education (ICSE) on 19th and 20th September 2023 at India Habitat Centre, New Delhi, on the theme, "Educating for Climate Action and Sustainability". The conference will mainly focus on the need to engage the participants toward a shift from dialogue to action for sustainability and to catalyse the transition to build the knowledge, skill and attitude needed to drive meaningful transformation towards climate action and sustainability. Previous 4 versions of ICSE have already created an active platform for networking and partnership. The ICSE has now become a crucial gathering for sustainability educators and professionals across the globe. The 5th ICSE will further build upon and consolidate the experience and strength of the network to meaningfully deliberate on the educational imperative of climate change and sustainability.

Objectives

The overall objective of the conference is to inspire positive and constructive dialogue among the participants by sharing knowledge, skills, practical examples to motivate them to initiate innovative action through various programmes and activities. This will also include sharing of experience and

strategies, curriculum, pedagogy, policies, and programmes to fostering leadership, advocacy and how education in both formal and non-formal settings can respond to climate crisis. Following are some specific objectives of the conference:

1. To provide a platform for sharing good practices, ideas and examples related to climate action and sustainability through education and learning.
2. To highlight the importance of education as a powerful tool for promoting positive behavioural change to address climate change and sustainability challenges.
3. To empower and encourage youth to become climate and sustainability ambassador, in their communities and beyond.
4. To come up with a set of recommendations for joint projects/ ecopreneurs/ campaigns and actions for climate change and sustainability.

Participants & format of the ICSE Conference 2023

The 5th ICSE will be organized on September 19 (Tuesday) & 20 (Wednesday), 2023 through hybrid mode between 08:30 – 19:30 hrs at India Habitat Centre, New Delhi, India by Mobius Foundation in partnership with some of the key environmental organizations, UNESCO, UNEP, Centre for Environment Education (CEE), Foundation for Environmental Education (FEE, Copenhagen), The Climate Reality Project India, The Energy and Resource Institute (TERI), WWF India, TERRE Policy Centre etc.

The conference is expected to bring together around 300 participants physically (250 Indians + 50 Foreigners) and will be joined by thousands virtually from across the globe representing multi-disciplinary and diverse group of stakeholders including: policy makers, teachers and educators, young professionals, representative of schools and education networks, youth, scientists and technical experts, as well as individuals from the private sector and civil society. The event will be graced by eminent speakers/ distinguished dignitaries via 6 plenary sessions including inauguration and closing ceremony. There will be sessions for contributed papers and posters from diverse fields and professions. Presentations and discussions will be organized in the form of panel interactions, working groups, workshops, symposia, round table by ICSE partners through 15 parallel thematic sessions in two days. There will be a special plenary for Youth4Earth campaign winners and young professionals. ICSE will also showcase special plenary on population stabilisation as part of Mobius Foundation's year-long campaign 'VIRAM: Agenda Sustainability' with India Today Group. The Conference will also facilitate display of exhibits, stalls, projects and practices by partners and delegates to showcase their work towards sustainability. There will be ample opportunities for interactions, networking, developing linkages and partnerships during cultural evenings, open sessions, poster presentation throughout the conference.

Outcome

The conference will provide a unique opportunity for educators, policymakers, and other stakeholders to come together to share their experiences, knowledge, and best practices on educating youth for climate action and sustainability. Through this conference, we hope to inspire and empower youth to act towards building a greener future. Together, we can make a positive impact on the planet and secure a sustainable future for generations to come.

Chief Guest



Shri Dharmendra Pradhan

**Hon'ble Minister of Education and Minister of Skill Development & Entrepreneurship,
Government of India**



Messages



Mr. Pradip Burman
Chairman, Mobius Foundation

Welcome to the 5th International Conference on Sustainability Education (ICSE), focused on the theme “Educating for Climate Action and Sustainability.” This theme holds great significance in today’s world, as climate change remains one of humanity’s most pressing challenges.

Education possesses the power to shape attitudes and behaviours, equipping individuals with knowledge and skills to understand the impact of our actions on the planet. Through education, we can foster motivation to make sustainable choices and implement policies and practices that prioritize the health of our planet.

This conference provides an excellent opportunity for educators, researchers, policymakers, and other stakeholders to come together and exchange ideas, strategies, and innovative solutions for educating on climate action. We are privileged to have an exceptional group of keynote speakers and panellists who will share their insights and perspectives on promoting climate action and sustainability through education. I am confident that this conference will be an enlightening experience for all participants and contribute to the global effort in creating a more sustainable future for generations to come. I encourage each of you to actively participate in this event and join the worldwide drive to create a sustainable future.



Dr. Ram Boojh

CEO, Mobius Foundation & ICSE Convener

A very warm welcome to the 5th International Conference on Sustainability Education (ICSE), focused on the theme “Educating for Climate Action and Sustainability.” In today’s world, this theme holds immense significance as climate change remains one of humanity’s most pressing challenges.

The Intergovernmental Panel on Climate Change (IPCC) Report released in March 2023 has also emphasized on the critical importance of education in driving climate action and sustainability. It underlines that expanding education, encompassing capacity building, climate literacy, and disseminating information through climate services and community-based approaches, can heighten risk perception and accelerate behavioural changes and planning.

As we embark upon the fifth year of the successful run of ICSE, it is noteworthy that we have continued our journey even through the challenging times of the pandemic. Our unwavering commitment to education, despite the adversities, reinforces the profound message that #education never-stops. It is a testament to the resilience and determination of the community of educators and teachers to drive positive change in the face of obstacles. The ICSE since its very inception in 2019, has established itself as a vital platform for professionals, educators, leaders, policymakers, teachers, and practitioners from diverse disciplines and professions to engage in discussions and dialogues on sustainability education. We have fostered a distinct trend of exploring the broad and diverse perspectives of sustainability education, igniting transformative conversations among experts in the field.

Aligning with the global understanding of the important role of education in finding solutions to climate change and sustainability issues, this conference offers an exceptional opportunity for educators, researchers, policymakers, and other stakeholders to come together, to exchange ideas, strategies, and innovative solutions for effectively addressing planetary issues of climate action and sustainability through education. We are privileged to host an exceptional group of keynote speakers and panellists who will share their invaluable insights and perspectives on educating about climate action and sustainability. I am confident that this conference will be an enlightening experience for the participants and will significantly contribute and strengthen the role of education as an enabler of transformative action towards a transition to a sustainable world. Thank you for your unwavering support, and I look forward to your active engagement in the 5th International Conference on Sustainability Education.

Profiles of Key Dignitaries



Mr. Pradip Burman
Chairman, Mobius Foundation

Pradip Burman is an influential leader, sworn environmentalist and a crusader of sustainability. He is the grandson of Dr. S.K. Burman, the founder of India's largest ayurvedic company, Dabur. Born in a family of innovators and philanthropists, he imbibed the leadership quality and has always been passionately interested in social causes. To pursue his dream of leading the world towards a more sustainable future, Mr. Burman founded Mobius Foundation in 2015 with the sole objective of promoting environment sustainability.



Dr. Jane Goodall, DBE
Founder - The Jane Goodall Institute (JGI) & UN Messenger of Peace

Dame Jane Morris Goodall is an English primatologist and anthropologist. Seen as the world's foremost expert on chimpanzees, Goodall is best known for her 60-year study of social and family interactions of wild chimpanzees since her first visit to Gombe Stream National Park in Tanzania in 1960, where she witnessed human-like behaviours amongst chimpanzees, including armed conflict. In April 2002, she was named a UN Messenger of Peace. Goodall is an honorary member of the World Future Council.



Mr. Kartikeya Sarabhai
Founder and Director, Centre for Environmental Education (CEE), Ahmedabad, India

Kartikeya Vikram Sarabhai is the founder and director of the Centre for Environment Education headquartered in Ahmedabad, with offices across India as well as trustee of the Sabarmati Ashram Preservation and Memorial Trust, and of the Physical Research Laboratory (PRL). He has served on many committees set up by the Ministry of Environment and Forests and Ministry of Human Resource Development of the Government of India, primarily focusing on the greening of India's formal education system, and initiatives for biodiversity education.



Dr. Ajay Mathur
Director General, International Solar Alliance (ISA), India

Ajay Mathur is an Indian energy sector expert who is currently the Director General of the International Solar Alliance. He was formerly the Director General of The Energy and Resources Institute and the Director General of India's Bureau of Energy Efficiency. He has also been a member of the Indian Prime Minister's Council on Climate Change. He was a part of India's negotiating team at the 2015 United Nations Climate Change Conference where the Paris Agreement was signed. He is the author of the book 'Energy Efficiency Matters' along with Leher V Thadani.



Mr. Atul Bagai
Country Head, United Nations Environment Programme, UNEP-India Office, New Delhi

Shri. Atul Bagai is the Country Head for United Nations Environment Programme's (UNEP) India Office. UNEP is UN's leading global environmental body that sets the global environmental agenda. Previously, as a career diplomat Shri. Bagai rose to be the Director (Ozone) in MoEFCC, Government of India. He worked on various senior positions in the State of Uttar Pradesh and the Central Government. As a UN veteran he has spent over two-decades spearheading challenging assignments in regions across South and Southeast Asia & the Pacific Islands.



Dr. Vibha Dhawan
Director General, The Energy and Resources Institute (TERI), New Delhi, India

Dr. Vibha Dhawan is Director General of The Energy and Resources Institute and is associated with the Institute since 1985. She also served as the Vice-Chancellor of TERI School of Advanced Studies during 2005-2007. Dr Dhawan is actively involved in research as well as policy development, both at the national and international level. She is a task force member of a number of committees of the Department of Biotechnology (DBT), the Biotechnology Industry Research Assistance Council (BIRAC), the Biotech Consortium India Limited (BCIL) etc.



Mr. Praveen Garg
President, Mobius Foundation

Praveen Garg is a specialist in public policy in South Asian context, with a focus on finance, law and environment. He is an Indian Administrative Service Officer (1988, Madhya Pradesh cadre), retired as Special Secretary, Ministry of Environment, Forest and Climate Change, Government of India. He has 33+ years of work experience across various areas and levels in the Indian government. From handling district administration in remote parts of Madhya Pradesh, leading the charge on the formulation of the National Judicial Appointments Commission Act in the Ministry of Law and Justice to spearheading numerous reforms in the Financial Markets Division of the Department of Economic Affairs, Ministry of Finance.



Shri G. Asok Kumar
IAS, Director General, National Mission for Clean Ganga (NMCG)

A 1991 batch IAS officer belonging to the Telangana Cadre, G. Asok Kumar, had earlier served at the Centre as Joint Secretary in the Ministry of Civil Aviation where he set-up the Aircraft Accidents Investigation Bureau and played a key role in reviving the then ailing airline industry. A winner of Telangana Excellence Award in 2018 and Jalmitra Award in 2002, he has initiated/completed many infrastructure projects like the Outer Ring Road, Krishna Phase-2 Drinking Water Pipeline, Godavari Drinking Water Pipeline Project, etc. in Hyderabad. He has made significant and diverse contributions to the Water and Sanitation Sector.



Dr. Ram Boojh
CEO, Mobius Foundation & ICSE Convener

Dr. Ram Boojh served the UNESCO South Asia Cluster Office in New Delhi during 2007-2018 as Programme Specialist/ Head of the Natural Sciences Unit, coordinated the South and Central Asia MAB Network (SACAM) as its secretary. He is Co-Founder of the World Ocean Network- an international network of professionals involved in ocean education and conservation issues. He has published over 75 research/technical papers in various journals/ publications of repute 19 Books/technical Reports: 19 and 30 popular articles and other miscellaneous contributions.



Ms. Donna Goodman
Founder, Earth Child Institute, USA

Donna has been a champion of the rights and participation of child and young people in the environment sector in over 60 countries for more than 25 years. Her international development work has been widely recognized and published by UN partners including UNICEF, United Nations Environment Programme (UNEP), World Health Organization (WHO) and others. She is the Founder of Earth Child Institute (ECI), an international not-for-profit organization working in more than a dozen countries, including Brazil, China, India, Ghana and the US.



Dr. Anil Prakash Joshi
Environmentalist and Founder, HESCO, Dehradun, India

Dr. Anil Prakash Joshi is an environmentalist, green activist, and the founder of Himalayan Environmental Studies and Conservation Organization (HESCO), a Dehradun-based voluntary organization. His work majorly includes developing sustainable technologies that are ecology inclusive economy for ecosystem development. He has coined GEP (gross environmental product), an ecological growth measure parallel to GDP. The Government of India awarded him the fourth highest civilian honour of the Padma Shri, in 2006, for his contributions to Indian society. He was also awarded Padma Bhushan, third highest civilian award in 2020 for environmental conservation in Uttarakhand.



Prof. G.D Sharma
V.C., USTM, Shillong, India

Prof. G.D Sharma is a leading educationist, eminent scholar, reputed life scientist, and well-known academic administrator of India as a Vice Chancellor. He has served two Central Universities of Government of India in the North Eastern states. He has also contributed a lot in understanding of culture, values and philosophy of the great Indian nation through education. Prof Sharma has guided 60 research scholars for their Ph.D. degrees, 5 M.Phil. and Post -Doctoral Fellow.



Dr. Manoranjan Mohanty

Adviser / Scientist G, office of the Principal Scientific Adviser, Gov of India.

Dr. Manoranjan Mohanty working as Adviser in the office of the Principal Scientific Adviser to Government of India, New Delhi, has more than 22 years of experience in research and innovation and recently into policy making. Working as Mission Leader in one of the most important missions of the Office of the PSA that is ‘Waste to Wealth’. He is into development of some of the white papers on waste to energy concept leading green hydrogen including agricultural waste, waste water, faecal sludge, plastic wastes etc. Working in the process of developing policy document on “Empowering Young Scientists of India”. He has worked for the Indian council of Agricultural Research (ICAR) at the Indian Institute of oil Science, Bhopal which is the premier Institute of Indian in the field of natural resource management. He is also an expert in the field of Soil Carbon Sequestration, modelling and carbon credit estimation in agriculture and allied fields.



Mr. Ravi Singh

Secretary General & CEO, WWF-India

Mr. Ravi Singh is the Secretary-General and CEO of WWF-India since 2003. He began his career as a Lecturer at Bhagat Singh College, Delhi University, after completing his Masters from St. Stephen’s College in 1975. With a profound passion for nature conservation, Mr. Singh has been actively involved in conservation-related matters since 1976, and he is associated with various organizations like WWF and BNHS. As the head of WWF-India, the country’s largest conservation organization, he actively engages in national forums on biodiversity and measures to reduce human impact. Mr. Singh serves as a member of advisory councils for several institutions and has actively participated in numerous national and international events.



Mr. Alistair Currie

Head of Campaigns and Communications, Population Matters, UK

Mr. Alistair Currie is the Head of Campaigns and Communications, Population Matters. The organisation campaigns to achieve a sustainable human population, to protect the natural world and improve people’s lives. Sir David Attenborough is the patron of Population Matters. Alistair has been a professional campaigner for 20 years and has been campaigning for animal and human rights, he was keen to contribute in the environmental and international development fields and joined Population Matters in 2016.



David R. T. Richardson

CEO, Population Crisis, UK

A mature accountant (FCCA) & qualified biologist with a strong scientific background. Solid experience in the Jersey Finance Sector; in banking, trust, tax, compliance & regulatory sectors. Excellent communication and relationship building skills. Broad experience in several countries, and unrelated areas of work including having to survive harsh practical conditions. An analytical approach to work, spending a high degree of attention to detail. Excellent research and problem solving skills. Deep knowledge of developing economies. Now has sufficient experience to produce in-depth media documentary films of population, environmental and innovative themes.



Mr. Sam Barratt

Chief, Environmental Education and Youth Unit-UNEP, Nairobi

Sam Barratt is the Chief of the Youth, Education and Advocacy Unit in UNEP’s Ecosystems Division and Co-Chair of the UN Higher Education Sustainability Initiative (HESI). He has a remarkable track record of spearheading impactful initiatives, including founding the Playing for the Planet Alliance with the video gaming industry to promote sustainable behaviours and cleaner energy use. Sam has also launched Earth School with TED-Ed and oversees UNEP’s Youth and Education Alliance, representing over 2,700 universities worldwide. He also manages the non-formal education programme work with the Girl Guides and World Scout Movement which has seen the launch of the Tide Turners Plastic Challenge Badge programme and a new Earth Tribe initiative on environmental education.



Mr. Leonard Sonnenschein,

President Conservation for the Oceans Foundation

Leonard Sonnenschein is CEO of World Aquarium - A Children’s Place and in the past 25 years has built and operated 4 public aquariums. Currently president of the Conservation for the Oceans Foundation,

he supervises students coming from over 50 universities doing research in its laboratories in sustainable agriculture, aquaculture, fisheries, coral and coastal restoration, soil and water remediation, and drought resistance. Leonard's influence extends globally as the United Nations representative for St. Louis Aquacenter, Inc., where he consults on climate change, health, education, and multi-stakeholder engagement, with a particular focus on water and ocean-related issues. Leonard's work includes developing innovative solutions to global challenges and conducting independent field trials, leading to validated products and eco-services in various critical areas such as aquaculture and fisheries improvement, coral reef restoration, and sustainable agricultural practices.



Ms. Joyce Poan

Programme Specialist and Chief of Sector - Education-UNESCO, New Delhi

Joined the UNESCO New Delhi Office in October 2021 as Programme Specialist and Chief of Education, and manages the implementation of UNESCO's educational priorities and activities in Bhutan, India, Maldives and Sri Lanka. From 2009 to 2021, Joyce was based at UNESCO Headquarters and worked in the Education Sector's Executive Office, before transferring to the Division of Peace Education and Sustainable Development. With the Education Sector, Joyce focused on sectoral priorities and management of the UNESCO's Education Institutes and Centres. She has also worked on the Global Citizenship Education (GCED) programme and on thematic areas such as peace and human rights education, reconciliation, nationalism, education for international understanding, and prevention of violent extremism.



Dr. Erach Bharucha

Director BVIEER, Pune, India

Dr. Erach Bharucha has been active in wildlife and nature conservation for nearly fifty years. A well-known wildlife photographer, he has travelled and studied Indian National Parks and Wildlife Sanctuaries extensively over the last three decades. He has been a member and executive of such conservation institutions as the Bombay Natural History Society, Worldwide Fund for Nature, and Wildlife Institute of India. Dr Bharucha heads the Bhartiya Vidyapeeth Institute of Environmental Education and Research (BVIEER). A surgeon by profession, he works in Pune, India. He has authored textbooks on Environmental Studies for Undergraduate courses and books on conservation and biodiversity.



Ms. Nandita Bajaj

Executive Director, Population Balance, USA

Nandita Bajaj is the Executive Director of Population Balance that offers education and solutions to address the intersectional impacts of human overpopulation and overconsumption on the planet, people, and animals. She has a Master degree in Humane Education, and over 15 years of experience working in engineering, education, and non-profit management. As faculty with the Institute for Humane Education at Antioch University, Nandita teaches and does research in the areas of pronatalism, anthropocentrism, human rights, environmental ethics, and overpopulation and their impacts on reproductive, ecological, and intergenerational justice.



Dr. Pramod Sharma

Senior Director of Education, Foundation for Environmental Education (FEE), Denmark

Dr Pramod Kumar Sharma is working as Senior Director of Education with Foundation for Environmental Education (FEE). He is an Education for Sustainable Development professional with a broad experience of 20 years. Before joining FEE, he was working with FEE member organization Centre for Environment Education in India and handled a portfolio of school programmes dealing with quality education and education for sustainable development. His current area of interest is the development of measurable outcome indicators for SDG Target 4.7 and peace education.



Ms. Olivia Copsey

Director of Education, Foundation for Environmental Education (FEE), Denmark

Olivia Copsey is Director of Education at the Foundation for Environmental Education, which is a lead partner of the Greening Education Partnership. She has over 20 years' experience in design, management and monitoring of ESD programmes in the UK Channel Islands, the Indian Ocean, and East Africa. Olivia's academic research concerns the linkages between Eco-Schools and improved education quality and access.



Ms. Iwona Gin

Head, World Ocean Network, Nausicca, France

Iwona Gin, Head of European Projects at Nausicca, National Sea experience Centre in France has developed and managed marine science communication projects, as well as partnerships, conferences and expert group meetings. Her expertise is mainly in stakeholder’s engagement and general public empowerment to inspire a behavioural change for sustainable management of the oceans and seas.



Mr. Jadav Payeng

Environmentalism, Forest Man of India, Assam India

He is an environmental activist and forestry worker from Majuli, popularly known as the Forest Man of India. Over the course of several decades, he has planted and tended trees on a sandbar of the river Brahmaputra turning it into a forest reserve. The forest, called Molai forest after him, is located near Kokilamukh of Jorhat, Assam, India and encompasses an area of about 1,360 acres / 550 hectares. In 2015, he was honoured with Padma Shri, the fourth highest civilian award in India. He was born in the indigenous Missing tribe of Assam.



Ms. Antonella Vassallo

Managing Director, International Ocean Institute HQ, Malta

Antonella Vassallo holds an academic background in Chemistry and Biology, specializing in environmental appraisal and aquaculture and nutrition of finfish. Since 2014, she has been serving as the Managing Director of the International Ocean Institute (IOI) at its Headquarters in Malta, and an ex-officio member of the IOI Governing Board. In this role, she oversees the management and administration of IOI matters, including capacity building, training, and education initiatives. Ms. Vassallo is involved in the coordination of projects, partnerships with other organizations, and outreach and information dissemination. Ms. Vassallo has served as a Board Member of the Malta Resources Authority and as a Member of the Natural Heritage Advisory Committee of the Malta Environment and Planning Authority. Her work also includes lecturing, research, and fieldwork activities with the University of Malta.



Mr. Sunil Murlidhar Shastri

Consultant, Educator, and Speaker

Mr. Sunil is a consultant, expert and speaker in ocean and environment governance. He found his passion for Pacem in Maribus in 1982 under the tutelage of Elisabeth Mann Borgese and has since made it his mission. Mr. Sunil is best known internationally for his Master Class in Ocean and Environmental Governance and for his erudite analysis and candid opinions. In the past, Mr. Sunil has been an academic and researcher in mining and ocean engineering, and also a Rotary International Paul Harris Fellow. He was born in India in 1955 and has lived in the UK since 1988 with his wife and son.



Dr. Vinitaa Apte

Founder Director, TERRE Policy Centre, Pune, India

Dr Vinitaa started this NGO with a motto “To think is good but to act is better”. She has developed more than 10 forestry’s on high mountain ranges through the PPP (Public-Private Partnership) model. With a strong communication background, she was working as a consultant in United Nations Environment Programme, Paris and developed Media Strategy, Outreach strategy for social media, implemented the PPP model. Dr. Apte represented India in many international conferences on climate change.



Dr. Vimal Katiyar

Dean R & D, IIT Guwahati, India

Dr Vimal Katiyar is currently a Professor in the Department of Chemical Engineering at Indian Institute of Technology Guwahati (IIT), India. He is also an Honorary Senior Fellow to Kyoto Institute of Technology, Japan, Visiting Professor at GIFU University, Japan and has also been honored as Chair Professor at Numaligarh Refinery Limited & Hindustan Gums Co. Limited. He received his Ph.D. in Chemical Engineering from IIT Bombay, India. Currently, he is the coordinator for three Centre of Excellence at IIT Guwahati including Centre of Excellence for Sustainable, Government of India and the Joint Centre of Excellence for Biofuels and Bio commodities.



Ms. Poonam Muttreja

Executive Director, Population Foundation of India (PFI), New Delhi, India

Poonam Muttreja is the Executive Director of the Population Foundation of India. She has more than 30 years of experience in the socio-development sector. Before joining PFI, Ms. Muttreja worked with the McArthur Foundation as Country Director where she was responsible for the Foundation's grants in India. She has a Master's Degree in Public Administration from the Kennedy School of Government, Harvard University. Ms. Muttreja has made an active contribution to the NGO sector in India. She associated with several national and international organizations in the capacity of a member of the governing board and advisory council.



Dr. Neelima Jerath

Director General, Pushpa Gujral Science City (PGSC), Punjab, India

Dr Neelima Jerath, Director General, Pushpa Gujral Science City is PhD in Botany (1980, specialization: Ecology and Environmental Science), Diploma in Management from IGNOU (1997) and has a 10-credit course on Education for Sustainable Development from University of Uppsala, Sweden (2012). Prior to joining PGSC, she was Executive Director, Punjab State Council for Science & Technology, founder Member Secretary, Punjab Biodiversity Board & Punjab State Innovation Council. She has also worked as Chairperson and Member of State Expert Appraisal Committee for Environmental Clearance of projects.



Ms. Prarthana Borah

Director, CDP

Prarthana leads the implementation of the CDP India strategy. She has over two decades of experience in strategy planning, building networks and program leadership on diverse sustainability issues like climate change, air pollution and biodiversity conservation. Prior to joining CDP, she was Country Director, India of Clean Air Asia, an international not-for-profit set up by the Asian Development Bank, responsible for expansion and positioning of the organisation strategically in India. Prarthana has previously worked with national institutes of Indian government ministries where she was involved in leading and implementing environmental projects in partnership with UN agencies for capacity building and policy support. She has led resource mobilisation and established partnerships with private sector, civil society, and donors to influence policy and action. She holds a Masters in Economics and is trained in Environmental Education.



Mr. Aditya Pundir

Director, Climate Reality Project India and South Asia, New Delhi, India

He took over the branch in 2010 and is posted in New Delhi. He received his training from Honourable Al Gore in 2009 in Australia, and has conducted numerous presentations since then. He is active in community leadership, serving as an Honorary Warden for Civil Defence from 2005 – 2011 and as an Editor of an environmental website from 2008 onwards. Has authored 5 Environment Education CD ROM's and 3 Comics. He holds a Master's degree in Business Management and a graduation in Geology with a diploma in Green Education and Environmental Reporting.



Dr. Arvind Anil Boaz

Climate Consultant, DFID-CCIP-ACT Raipur, Chhattisgarh, India

Dr. Arvind Boaz is a distinguished international consultant renowned for his expertise in climate change, forestry, and natural resource management. With an impressive career spanning various roles, he has served as the Director General of the South Asia Cooperative Environment Programme (SACEP) and the UN South Asian Seas Programme. Notably, he was the first Indian Forest Service officer to be appointed as the Head of an international UN multilateral organization, earning the status of Ambassador, Head of Mission, and Diplomat by the Government of Sri Lanka. A highly accomplished academic, he holds a Doctorate in Sociology and six master's degrees in various fields, including Forestry and Human Resource Management. With a vast publication record and significant international representation, Dr. Arvind Boaz continues to make substantial contributions as an expert consultant in the realms of climate change, forestry, environment, livelihoods, and natural resource management.



Dr. B.C. Sabata

Additional Director (R&D), KIIT Deemed University, Bhubaneswar, Odisha, India

Dr. BC Sabat is a prominent environmentalist and educator known for his invaluable contributions to the betterment of the environment in Delhi. Throughout his career, he has been deeply involved in shaping state-level strategies and policies aimed at promoting eco-friendly behaviour and green concepts among children and students in schools and colleges. His initiatives include establishing a network of 2000 Eco-clubs, organizing various awareness campaigns, and conducting training programs for teachers and lecturers on science, technology, environment, and mathematics. Beyond his work at the state level, Dr. Sabat has played a vital role in coordinating national and international seminars, workshops, and conferences in collaboration with government agencies, multilateral/bilateral organizations, industries, and civil societies.



Dr. Hiroko Shibakawa

UNESCO Chair in Research and Education for Sustainable Development, Okayama University, Japan

As a former high school teacher in Okayama Prefecture, she brings practical experience in Education for Sustainable Development (ESD). Currently an assistant professor at the ESD Promotion Centre at Okayama University, her research centers on ESD in social education and lifelong learning, with a focus on fostering ESD communities of practice within local communities. She actively supports UNESCO Associated Schools (ASPnet) in Okayama City, collaborating with schools, community learning centers, and local companies to develop ESD programs, teaching materials, and teacher training. As an advisor to a network of ASPnet high schools in Okayama Prefecture, she facilitates exchange and implementation of ESD initiatives among these schools and with overseas counterparts. Her contributions have been instrumental in making Okayama an international award-winning city and a global leader in ESD.



Ms. Meena Raghunathan

Environment Educator, Author

Meena has 35 years of experience across the NGO and corporate sectors. She has spent 19 years in non-profit world at the Centre for Environment Education. Meena continued to work in the development sector for the next 15 years and headed CSR for the GMR Group (one of India's largest infrastructure groups with interests in Airports, Power, Roads), with a focus on Education, Health, Skill Training, and Livelihoods. Meena has developed textbooks for various levels, including the first textbook on Environment for the Undergraduate level in India, brought out by Sage and has been involved in the development of educational materials at various levels, as well as policy documents.



Ms. Gayatri Raghwa

Environment Education Consultant, UNEP, New Delhi, India

Gayatri Raghwa joined UNEP in early 2019 as UNEP's sole environmental education consultant based in India. She launched the Tide Turners Challenge in India and focuses on higher education work. As of mid-2021 Gayatri is in the process of setting up the India Green University Network. She has ensured the dissemination of Earth School (where India is second to the USA in terms of participation), and supported UNEP initiatives such as the Little Book of Green Nudges and the Race to Zero. A teacher by training, with 22 years of experience at college and school levels in India, Gayatri also spent 15 years raising the profile of environmental education in the UAE. She advises several international organizations and is honorary Executive Director at Wild Ecologues, an organization committed to providing real life sustainability experiences to youth and other target audiences.



Mr. Richard McDonald

Founder & Executive Chairperson, R Futures Group Switzerland

After graduating from Oxford University with Languages degree and teaching Diploma, Richard McDonald taught in leading boarding schools in the UK before his appointment as Head Master of Aiglon College, Switzerland. He spent 18 years as leader of Aiglon either side of a stint as education strategy leader in another leading Swiss school, also serving as Chairman for many years of the Swiss Group of International Schools and as a trustee of Round Square until 2022. In this same year he founds R Futures Group, an educational consultancy that aims to connect and galvanise schools and youth worldwide in efforts to accelerate towards a net zero economy by 2050.



Ms. Neha Raghav

Head of the Department, Environment Education, WWF-India

Neha Raghav, Head of the environment education WWF-India is leading the education initiatives of the organization that aims to inform, inspire and empower children, youth and citizens for a sustainable planet. She is a qualified environment educator with twenty-three years of experience in the domain of education. She has conceptualized, developed and implemented environment education programmes at WWF-India for the past 8 years. Earlier as a teacher and trainer and curriculum expert, she designed school curriculum and teachers training modules at various educational institutions and education consultancy firms.



Mr. Prabhjot Singh Sodhi

Senior Programme Director (Circular Economy) Centre for Environment Education, Ahmedabad, India

As Sr. Program Director Country Program Manager, Circular Economy for Centre for Environment Education, he has 40 years of diverse work experience in domains of environmental sector which includes implementation on the agriculture, non-biodegradable/dry waste sector strategies, systems thinking, materials flow, recovery centre, business models, informal sector, including safaii sathis (waste pickers). In 2012, he received Talented Conservator Award by The George Washington University, Washington DC, USA. In 1998, he was awarded with the most Excellent Order of the Member of the British Empire' (MBE) by the Government of the United Kingdom.



Dr. Manoranjan Hota

Advisor, Skill Council of Green Jobs, New Delhi, Ex. Advisor, MoEFCC, Govt. of India

Mr. Manoranjan Hota is a distinguished environmental professional with 38 years of expertise in Environmental Impact Assessment (EIA), compliance, sustainability, and governance. Currently advising the Skill Council for Green Jobs, he previously served as Advisor to the Ministry of Environment, Forest, and Climate Change. With a global footprint, his career spans coal mining, hazardous waste, biosafety, and more. He's a multilateral agreements champion, including roles as SAICM regional coordinator and UNEP Mercury Programme chair. Mr. Hota's contributions to policy, pollution control, and environmental health, alongside his leadership in diverse countries, establish him as an esteemed global expert in environmental management.



Dr. Nakul Parashar

Former Director, Vigyan Prasar

Dr. Nakul Parashar is a distinguished professional with over three decades of expertise in areas spanning Technology Services, Content Management, BPO, KPO, Business Development, and Product Lifecycle Management. His extensive knowledge encompasses Operational Enhancement, University-level Teaching & Research, Business Analytics, and Science & Technology Policy Execution. Dr. Parashar excels in Academic and Enterprise Content Management, Instructional Product Design, Global Business Development, and Fundraising. With a background in Applied Physics and a Post-Graduate Diploma in Business Administration, he has authored numerous acclaimed popular science books and research articles. His notable achievements include founding India's premier OTT Channel on popular Science & Technology, IndiaScience.in, and pioneering XML-First Workflow Processes for Journal Publishing.



Mr. K. K. Sharma

MD, DCM Shriram

Mr. K. K. Sharma is a distinguished professional with over 34 years of experience in Agrochemicals and Pharmaceuticals, specializing in manufacturing, EHS (Environment Health and Safety), and Sustainability. Holding the prestigious title of 1st rank holder and Gold medalist in Chemical Technology from Institute of Chemical Technology (ICT), Mumbai, he currently serves as the Whole Time Director-EHS at DCM Shriram Ltd. Mr. Sharma's extensive expertise encompasses roles at renowned companies like Gharda Chemicals, Ranbaxy, Jubilant, and Syngenta. He is a certified Sustainability Assessor by CII and has received accolades for his outstanding contributions.



Mr. Santhosh Jayram

Global Head, Sustainability, HCL Technologies

Mr. Santhosh Jayram is a trailblazing figure at the intersection of Digitalization and Sustainability, recognized as a Top Green Voice by LinkedIn in 2022 and listed among the top 50 global executives driving a sustainable future by Constellation Research Inc. With nearly three decades of experience spanning 20 countries and diverse sectors, he has been a pivotal force in sustainability and climate change. Notably, as a former Partner at KPMG, he led the largest sustainability and climate change consulting team within the global KPMG network. Mr. Sharma is a respected authority in shaping sustainability standards, having served on standard development committees for GRI and Account Ability. Currently, he plays a key role in the ESG advisory and Social Stock Exchange advisory committees established by SEBI, India's market regulator. He also contributed significantly to the Ministry of Finance's task force on Sustainable Finance Taxonomy. His impactful client work has been featured as case studies with esteemed academic institutions like Harvard and INSEAD.



Mr. Ashu Kalra

Vice President - Head of Global Corporate Real Estate and Environment Sustainability, Noida

Mr. Ashu Kalra is currently working as a Vice President - Head of Global Corporate Real Estate and Environment Sustainability in EXL Service.com India Pvt. Ltd. Backed by 25 years of experience in Sustainable Corporate Real Estate and Environmental Sustainability. He brings forth expertise in the areas of real estate strategic planning, project management, facility operations, vendor management, workplace design, climate change and employee health & safety. Leadership revolves around developing & executing business aligned CRE strategy, budgeting, stakeholder management, partner engagement, compliance, and M&A. He continuously structures and implements policies/procedures, new workplace standards to enhance efficiency and best-in-class deliverables. He has gotten sustained success in managing RE strategies, implementing, and executing large-sized projects, EHS in teams across global regions. He meticulously maintains international management standards of ISO (45001, 27001, 22301, 14001, and 50001) & statutory compliances related to EHS/Facilities. He completed his B. Tech and M. Tech from BITS Pilani. He also did the Executive Management program from Asian Institute of Management, Manila.



Mr. Ritesh Kumar Upadhyay

Associate General Manager, Lenskart

With nearly 13 years of extensive experience both in India and overseas, including technical visits to Shanghai, China and Bhavan, France, Mr Ritesh brings a wealth of expertise in IoT Industries 4.0 implementation, development of BSIV and BSVI mufflers for renowned clients like Cummins, TATA, and FIAT through Faurecia India, and optimizing operational efficiency of equipment and utilities. He has excelled in overseeing diverse maintenance and automation functions across Mechanical, Electrical, Instrumentation & Control, as well as Inspection & Reliability departments, earning accolades from CII for driving Low-Cost Automation initiatives resulting in substantial operational cost reduction and enhanced safety measures. Recognized for his interactive and motivational leadership style, Mr Ritesh has adeptly led cross-functional and culturally diverse teams, fostering collaboration and cultivating strong team members.



Mr. Ajay Kumar Pillai

Partner, Risk Advisory, Deloitte India

Ajay Pillai leads the Sustainability & Climate offering for Deloitte as part of the Risk Advisory. Ajay has an experience of over 22 years in consulting and advisory related to Environment & Social Governance, Climate and Sustainability. As a sector agnostic professional he has worked across diverse sectors such as mines & metals, roads/highways, infrastructure, oil & gas, manufacturing industries, renewable energy, power, financial institution, Banks etc. His expertise covers developing low carbon strategies, net zero road maps, climate risk assessments, sustainability & climate reporting, ESG transformation etc. He also has significant exposure to E&S impact assessments/ Due Diligence as well as in development and implementation of ESG management systems. He has worked with various funds in developing mechanism for screening of projects for investment as well as for developing mechanism for post project monitoring. He has worked closely with multiple DFIs such as IFC, ADB, AIIB, CDC, etc. for various E&S studies. He has also helped his clients implement various Sustainability & Climate Standards such as IFC, UNPRI, UNSDG, SASB, TCFD, SBTi etc. He is also a trained air quality modeler.



Ms. Bethany Davies

Research Fellow, Education Policy & Practice, Australian Council for Educational Research (ACER) Melbourne, Australia.

Bethany Davies is curious about the two big E's, Education and the Environment and how they intersect. This is reflected in her role as a Research Fellow at the Australian Council for Educational Research, where she has 7 years of experience in education in both research and practice. She has completed a Master's in Education (Globalisation and International Development) at the University of Cambridge, specialising in Environment Education and Climate Change Education and represented the ACER delegation at the 26th Conference of Parties (COP26).



Mr. Amit Banka

Founder, WeNaturalists

Amit Banka founded WeNaturalists with a simple motive – to bring equal opportunities and solutions to everyone working in the development sector and in climate action. Holding an MBA in Finance and a Bachelors in Science, Amit has had successful stints with various corporate houses including Disney UTV Group, Unilazer Ventures, and Zee Group and has founded multiple ventures in business transformation, agriculture, crowd funding, online gaming, and F&B. He's been named in the 'Definitive List of India's Leaders and Change Makers' for the BW Businessworld Social Impact Awards 2021. Apart from being an entrepreneur, he is also an ardent nature lover, wilderness explorer, and a bird photographer.



Dr. Avik Mukherjee

Dean - Research & Development, CIT Kokrajhar

Currently works as an Associate Professor at Food Engineering and Technology Department, Central Institute of Technology Kokrajhar (Deemed-to-be-University, MoE, Govt. of India). His current research interests are: (i) Improvement of microbial food safety and quality using natural and/or novel preservatives and/or antimicrobial agent(s). (ii) Nanotechnology in sustainable food preservation and packaging (iii) Utilization of food processing waste(s) for ethanol production through fermentation.



Dr. Santosh Kumar

Head of Department, Food Engineering and Technology, CIT Kokrajhar, Nominated Expert, IICR, Cell; Member, NISP, Cell

Currently working as Head of Department in Food Engineering and Technology and extensively working in the fields of Circular Economy and Sustainable Agri-Food Systems, Turning agro-waste into environment-friendly bioplastics, Biopolymer-nanocomposites for sustainable food packaging, Edible films and coatings to prolong postharvest shelf-life of fruits and vegetables, Functional nanocomposites for food and environmental applications and Hydrothermal and green synthesis of nanomaterials/nanoparticles.



Mr. Bhaskar Lath

Sr. Manager - Business & Strategy, ReCity, Mumbai

Bhaskar Lath is the Sr. Manager - Partnerships at Recity, a circular waste management company in India. With a decade of experience in the social impact sector, Bhaskar has worked in impact consulting with a variety of institutions including public institutions, philanthropic foundations and early-stage start-ups. Over the last 3 years, circular economy, sustainability, climate change are the key focus areas of his work. Bhaskar plays a crucial role in Recity in building effective and long-term business partnerships in the circular economy sector.



Ms. Michelle Dilhara,

Environmental Activist, Author, Philanthropist, Film & TV star, Sri Lanka
ICSE Youth Ambassador and Sustainability Leader

Michelle is an award-winning Sri Lankan actress, Environmentalist, Philanthropist and author. In 2019, she wrote the book "Social Invisibility is not a Fiction it Exists" after a 4 year research with Emeritus Professor Antonette Perera, Dr. Parakrama Warnasuriya and Dr. Shiromi Fernando. It talks about the people affected by social invisibility due to race, negligence, discrimination, age and language barrier, and how to minimize social invisibility and social exclusion. In 2019, she received the National Youth Icon Award for her book at the World Youth Summit held in New Delhi. She has conducted many awareness programs on climate change and social invisibility in universities, schools, newspapers, and television programs.

5TH INTERNATIONAL CONFERENCE ON SUSTAINABILITY EDUCATION

Theme: Educating for Climate Action & Sustainability
September 19 & 20, 2023 | India Habitat Centre, New Delhi, India

PROGRAM SCHEDULE

DAY 1 : Tuesday, September 19, 2023

8:30 - 09:30	REGISTRATION	Stein Auditorium Foyer
09:30 - 11:30	<p style="text-align: center;">INAUGURAL CEREMONY</p> <p>Master of Ceremonies will request guests to take their seats. Screening of the ICSE look-back film</p> <p>Lighting of the Lamp & Inauguration by Chief Guest: Shri Dharmendra Pradhan Hon'ble Minister of Education and Minister of Skill Development & Entrepreneurship, Government of India</p> <p>Welcome Song: GAV School Students</p> <p>Welcome & Introduction: Dr. Ram Boojh, CEO Mobius Foundation</p> <p>Special Message: Dr. Jane Goodall, DBE, Founder - The Jane Goodall Institute & UN Messenger of Peace (video message)</p> <p>Keynote Address: Shri Kartikeya Sarabhai, Founder Director, Centre for Environment Education (CEE)</p> <p>Address by Guests of Honour: Shri Atul Bagai, Country Head UNEP- India Dr. Anil Prakash Joshi, Founder HESCO Ms. Donna Goodman, Founder Earth Child Institute, USA</p> <p>Address by Mr. Praveen Garg, IAS (R) President, Mobius Foundation</p> <p>Address by Mr. Pradip Burman, Chairman, Mobius Foundation</p> <p>Address by Chief Guest: Shri Dharmendra Pradhan, Hon'ble Minister of Education and Minister of Skill Development & Entrepreneurship, Government of India</p> <p>Vote of Thanks: Dr. Ram Boojh, CEO Mobius Foundation</p>	Stein Auditorium
11:30 - 12:00	TEA/COFFEE BREAK	Stein Auditorium Foyer
12:00 - 13:00	<p style="text-align: center;">OPENING PLENARY Setting The Agenda</p> <p>Chair: Mr. Kartikeya Sarabhai, Founder and Director, CEE Co-Chair / Moderator: Dr. Ram Boojh, CEO Mobius Foundation</p> <p>Keynote Speakers:</p> <ul style="list-style-type: none"> • Dr. Ajay Mathur, Director General, International Solar Alliance, ISA (video message) • Dr. Vibha Dhawan, Director General, TERI, New Delhi • Mr. Ravi Singh, Secretary General & CEO, WWF-India • Mr. Manoranjan Mohanty, Adviser to the Principal Scientific Adviser, GoI, Delhi • Ms. Antonella Vassallo, Managing Director, International Ocean Institute, University of Malta • Ms. Joyce Poan, Chief of Education, UNESCO, India 	Stein Auditorium
13:00 - 14:00	LUNCH	Charminar Area

14:00 - 15:30					
SPECIAL THEMATIC SESSIONS					
(Venue under each session)					
Session 1 SILVER OAK 1	Session 2 SILVER OAK 2	Session 3 JACARANDA 1	Session 4 JACARANDA 2	Session 5 MAGNOLIA	Session 6 MAPLE
<p>CDP</p> <p>Theme: Private Sector Engagement in Climate Action</p> <p>Speakers:</p> <p>1. Moderator: Ms. Prarthana Borah-Director CDP</p> <p>2. Mr. Santhosh Jayaram, Global Head – Sustainability HCL Tech</p> <p>3. Mr. Ritesh Kumar Upadhyay, Associate General Manager, Lenskart</p> <p>4. Mr. Ashu Kalra, Vice President, Head of Global Corporate Real Estate and Environment Sustainability, EXL Services</p> <p>5. Mr. K.K.Sharma, MD, DCM Shriram</p> <p>6. Mr. Ajay Kumar Pillai, Risk Advisory, Deloitte, India</p>	<p>TERRE Policy Centre</p> <p>Theme: Building a multi-country partnership to increase the resilience of coastal population in South Asia</p> <p>Speakers:</p> <p>1. Chair: Mr. Leonard Sonnenschein, President Conservation for the Oceans Foundation</p> <p>2. Mr. Thies Geertz, Program Manager, Global Nature Fund, Germany (online)</p> <p>3. Mr. Kanna K. Siripurapu, Senior Fellow, SaciWaters</p> <p>4. Mr. Sunil Murlidhar Shastri, Consultant, Educator, & Speaker Ocean and Environmental Governance (online)</p> <p>5. Ms. Antonella Vassallo, Managing Director, International Ocean Institute, University of Malta</p> <p>6. Moderator: Dr. Vinitaa Apte, Founder Director, TERRE Policy Centre</p>	<p>UNESCO & CEE</p> <p>Theme: Integrating Climate Change in Education Systems</p> <p>Speakers:</p> <p>1. Mr. Kartikeya Sarabhai Founder and Director, CEE</p> <p>2. Prof. Sunita Farkya, Head, DESM, NCERT</p> <p>3. Ms. Joyce Paon, Chief of Education, UNESCO India</p> <p>4. Dr. R. Begur, Education Specialist UNICEF India</p> <p>5. Ms. Olivia Copsey, Director of Education, FEE Denmark</p> <p>6. Shri Souparno Banerjee, Senior Director, EE, CSE</p> <p>7. Dr. Santanu Basu, Project Director, HCL Foundation</p> <p>8. Ms. Heeta Lakhani, Youth Activist & Climate Educator, Green Warriors</p>	<p>Water Digest</p> <p>Theme: Water Literacy - Water Insights on Climate Change for Sustainable Future</p> <p>Speakers:</p> <p>1. Ms. Anupama Madhok Sud, Director & Editor, Water Digest</p> <p>2. Shri G. Asok Kumar, IAS, Director General, National Mission for Clean Ganga (NMCG)*</p> <p>3. Shri R.S. Tyagi, Expert Advisor, National Institute of Urban Affairs (NIUA), Ex-Member - Delhi Jal Board (DJB)*</p> <p>4. Mr. Anshuman, Director, Water Resources Division, TERI*</p> <p>5. Ms. Anjali Makhija, Chief Executive Officer, S.M. Sehgal Foundation</p> <p>6. Ms. Arya. V, Ph.D. Assistant Professor, Department of Civil Engineering, Indian Institute of Technology Delhi</p> <p>7. Dr. Jagdish Kumar, Senior Assistant Director & Chief, Shriram Institute for Industrial Research</p>	<p>IIT Guwahati & Central Institute of Technology, Kokrajhar</p> <p>Theme: Closing the Loop - Empowering Climate Action through Circular Economy Education</p> <p>Speakers:</p> <p>1. Chair: Dr. Vimal Katiyar, Dean, R&D IIT Guwahati</p> <p>2. Co-Chair: Mr. Prabhjot Singh Sodhi, Senior Programme Director, Circular Economy, CEE Ahmedabad</p> <p>3. Dr. Avik Mukherjee, Associate Professor Department of Food Engineering and Technology, Dean, R&D</p> <p>4. Dr. Santosh Kumar, Assistant Professor Department of Food Engineering and Technology, Head of Department Food Eng. and Technology</p> <p>5. Dr. Manoranjan Hota, Advisor Skill Council of Green Jobs, Ex Advisor MoEFCC, Gol</p> <p>6. Mr. Bhaskar Lath, Sr. Manager, Business & Strategy, ReCity, Mumbai</p>	<p>Green Lit Fest</p> <p>Theme: Women Writers in Sustainability - Old Dilemmas, New Realities</p> <p>Speakers:</p> <p>1. Moderator: Ms. Megha Gupta, Head, Youth Programme at the Green Literature Festival</p> <p>2. Ms. Donna Goodman, Founder Earth Child Institute, USA</p> <p>3. Ms. Meena Raghunathan, Environment Educator, Author</p> <p>4. Ms. Neha Sinha, Conservation Biologist, Author and Columnist</p> <p>5. Ms. Neha Dara, Head Round Glass Sustain</p> <p>6. Ms. Kavitha Iyer, Journalist & Editor</p> <p>7. Ms. Aparna Karthikeyan, Journalist and Senior Fellow, People's Archive of Rural India</p>
15:30 - 16:00					
TEA/COFFEE BREAK					
Stein Auditorium Foyer					

16:00 - 17:30	<p style="text-align: center;">2nd PLENARY SESSION</p> <p>VIRAM The Agenda Sustainability - Population, Climate Action and Sustainable Development: Role of Education and Empowerment</p> <p>Moderator- Mr Rajdeep Sardesai, Consulting Editor and Anchor, INDIA TODAY Opening Remarks- Mr. Pradip Burman, Chairman Mobius Foundation</p> <p>Panel Discussion (English) - 'Climate Action, Sustainability and Population Dynamics - Placing Girls and Women in Focus'</p> <p>Panelists:</p> <ul style="list-style-type: none"> • Ms. Poonam Muttreja, ED, PFI • Mr. David R.T. Richardson, CEO, Population Crisis, UK • Mr. Alistair Currie, Head of Campaigns and Communication, Population Matters • Ms. Nandita Bajaj, Population Balance, USA (online) <p>Panel Discussion (Hindi) - 'जनसंख्या, जलवायु, और जीवन'</p> <p>Panelists:</p> <ul style="list-style-type: none"> • Dr. Govind Singh, Dean Research Studies, Indian Institute of Mass Communication, Delhi • Dr. Ram Boojh, CEO, Mobius Foundation • Mr. Akash Ranison, Environmentalist • Ms Huma Masood, Senior Gender Specialist, UNESCO-India 	Stein Auditorium
17:30 - 18:30 (Parallel Events)	<p style="text-align: center;">SUSTAINABILITY THOUGHT LEADERS CONCLAVE</p> <p>Chairman: Dr. Erach Bharucha, Director, BVIEER, Pune</p> <ul style="list-style-type: none"> • Mr. Leonard Sonnenschein, President Conservation for the Oceans Foundation • Mr. Deepak Jain, Delhi Management Association, Chairman-ESG Committee • Mr. Jadav Payeng, Environmentalist, Forest Man of India, Assam • Dr. G.D. Sharma, President Association of India University and V.C., Uni. of Sci. & Technology Meghalaya, Shillong • Ms. Chubba Menla Jamir, Director Climate Change Studies & Knowledge Centre, Govt. of Nagaland • Ms. Bhuvana Santhanam, Head Global Outreach, Sri Satya Sai University of Human Excellence, Bangalore • Mr. Dilip Surkar, Executive Director, VASCSC, Ahmedabad 	Silver Oak
	<p style="text-align: center;">POSTER PRESENTATIONS</p> <p>Chair: Prof. Z.H. Khan, Zaheer Science Foundation Co-Chair: Dr. Ravichandran, Associate Professor, Lovely Professional University</p> <p>Jury: Dr. Abhdesch Gangwar, Focal Point, RCE Srinagar Ms. Radhika Bhagat, Founder, Sacred Earth Trust</p>	Jacranda Foyer
	<p style="text-align: center;">UNITED TOWARDS SUSTAINABILITY</p> <p>Launch of SASEANEE by CEE: South and Southeast Asia Network for Environmental Education</p> <p>Chair: Mr Kartikeya Sarabhai, Founder Director, CEE</p> <p>Established through the joint efforts of Centre for Environment Education (CEE), Foundation for Environmental Education (FEE), Northern American Association for Environment Education (NAAEE), IUCN CEC, Earth Charter and Mobius Foundation</p>	Stein Auditorium
18:30 - 19:30	<p style="text-align: center;">ORAL PRESENTATIONS (Abstract IDs 1 - 14)</p> <p>Chair: Dr. Neelima Jerath, Dr. Neelima Jerath, Director General, PGSC Co-Chair: Ms. Shweta Khare Naik, Executive Director, Jane Goodall Institute India (JGI) Jury: Dr. Divya Agarwal, Professor, Jesus and Mary College, University of Delhi</p>	Jacranda
18:30 - 19:30	<p style="text-align: center;">CULTURAL EVENING</p> <p>Performances by:</p> <ul style="list-style-type: none"> • Gyan Anant Vidyalaya (GAV) • Group Performance by Nagaland youths, Climate Studies & Knowledge Solution Centre, Govt. of Nagaland • DAV School, Pushpanjali, Delhi 	Stein Auditorium
19:30 onwards	DINNER	Charminar Area

DAY 2 : Wednesday, September 20, 2023

8:30 - 09:30	REGISTRATION	Silver Oak Foyer
09:30 - 11:00	<p>3rd PLENARY SESSION</p> <p>YOUTH CONCLAVE: Declaration of winners for the Youth for Earth Campaign 2023</p> <p>Setting the tone: Ms. Riya Deb, Engagement Officer, The Climate Reality Project, India</p> <p>Performance by the youth of St. Mary's, Dwarka</p> <p>Address by Mr. Aditya Pundir, Director India and South Asia for The Climate Reality Project</p> <p>Address by jury members:</p> <ul style="list-style-type: none"> • Ms. Alka Tomar, President, CEC • Dr. B.C. Sabata, Add. Director (R & D), KIIT Deemed University • Dr. Madhu Bhatnagar, ECP, TSRS. • Ms. Neha Raghav, Associate Director, WWF <p>Distribution of Awards</p> <p>Book Launch</p> <p>Special address by Ms. Iwona Gin, Head of European Projects at Nausicaa, National Sea Experience Centre in France</p> <p>Vote of Thanks: Dr. Bhagyashree Kesharwani, Programme Associate, Mobius Foundation</p>	Silver Oak

11:00 - 11:30	TEA/COFFEE BREAK	Silver Oak Foyer
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11:30 - 13:00	SPECIAL THEMATIC SESSIONS	(Venue under each session)
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Session 7 SILVER OAK 1	Session 8 SILVER OAK 2	Session 9 JACARANDA 1	Session 10 JACARANDA 2	Session 11 MAGNOLIA	Session 12 MAPLE
<p>TERI</p> <p>Theme: Moving towards Sustainable Development through Mission LiFE (Lifestyle for Environment)</p> <p>Speakers:</p> <p>1. Dr. Livleen Kahlon, Associate Director, TERI</p> <p>2. Dr. Neha, Senior Fellow, Strategic Communication for Sustainability, TERI (Moderator)</p> <p>3. Mr. Anshuman, Director, Water Resources Division of TERI & Winner of Mission LiFE</p> <p>4. Ms. Saumya Sil, Revenue Officer (WBCS)</p>	<p>The Sustainability Mafia</p> <p>Theme: Teaching Disciplined Entrepreneurship to Create 100 New Sustainability Ventures</p> <p>Speakers:</p> <p>1. Tarun Gangwar, Academic Director, Master's Union</p> <p>2. Sreyashee Das, CEO, AIC, Sangam Foundation</p> <p>3. Prof. J. Dhariwal, Assistant Prof. Department of Design, IIT-Delhi</p> <p>4. Prof. Vimal Katiyar, Dean R&D IIT-Guwahati</p>	<p>FEE</p> <p>Theme: Education Challenge to Embed Ecosystem Restoration into Educational Systems Worldwide</p> <p>Speakers:</p> <p>1. Dr. Pramod Sharma, Senior Director, FEE (online)</p> <p>2. Ms. Radhika Suri, Senior Programme Director, Global Networking and Early Childhood Education, CEE</p> <p>3. Mr. Oisín Gill, Consultant, Education for Sustainable Development, UNESCO (online)</p>	<p>Kalinga Institute of Industrial Technology</p> <p>Theme: Sustainability Education - Role of schools, colleges and universities</p> <p>Speakers:</p> <p>1. Facilitator : Dr. B.C. Sabata, Add. Director (R & D), KIIT Deemed University</p> <p>2. Dr. A. K. Suar, Ex-Chief Engineer, Odisha Pollution Control Board</p> <p>3. Dr. Subrat Kumar Panigrahi, Principal, Saraswati Degree Vidya Mandir, Berhampur, Odisha</p>	<p>Oral Presentations (Abstract IDs 15 - 30)</p> <p>Jury Members:</p> <p>Chair: Dr. Tabassum Jamal, Chairperson, Zaheer Science Foundation</p> <p>Co-Chair: Dr. Nakul Parashar, Ex Director, Vigyan Prasar</p> <p>Jury: Dr. Ruchi Sachan, Professor Miranda House</p>	<p>Pushpa Gujral Science City</p> <p>Theme: Science, Technology and Innovation for Sustainable Development Living</p> <p>Speakers:</p> <p>1. Dr. Neelima Jerath, Director General, PGSC</p> <p>2. Mr. Shubham Tandon, Project Officer-Resilience, Action for Climate Change and Environment (ACE) unit of UNDP</p> <p>3. Ms. Namita Gupta, Adviser/Scientist-G and Head of "Innovation in Science Pursuit for Inspired Research</p>

<p>5. Ms. Shashi Banerjee, Director, Shiv Nadar Schools</p> <p>6. Shri Rupeshvara Gaurang Das, From ISKCON, Lifestyle Coach, Motivatioal Speaker, Counsellor and Guide</p> <p>7. Dr. Amit Tutega, Founder, Connecting Dreams Foundation</p>	<p>5. Mr. Arjun, Director, The Sustainability Mafia</p> <p>6. Mr. Saksham Bansal, The Sustainability Mafia</p>	<p>4. M.r Arnau Macià Pou, Coordinator & Project Manager, Foundation for Environmental Education (FEE) (online)</p> <p>5. Mr. Harcharan Singh Rumana, Co-Lead Biodiversity, Afforestation Wetland Conservation at National Mission for Clean Ganga (NMCG)</p>	<p>4. Dr. Hiroko Shibakawa, Assistant Professor, ESD Promotion Centre Graduate School of Education, Okayama University</p> <p>5. Dr. Suraj K. Tripathy, Associate Dean, School of Chemical Technology, KIIT Deemed University</p> <p>Principal's Conclave</p>		<p>(INSPIRE)", Department of Science & Technology (DST), Govt. of India.</p>
<p>13:00 - 14:00 LUNCH Silver Oak Foyer</p>					
<p>14:00 - 15:30 SPECIAL THEMATIC SESSIONS (Venue under each session)</p>					
<p>Session 13 SILVER OAK 1</p>	<p>Session 14 SILVER OAK 2</p>	<p>Session 15 JACARANDA 1</p>	<p>Session 16 JACARANDA 2</p>	<p>Session 17 MAGNOLIA</p>	<p>Session 18 MAPLE</p>
<p>WWF</p> <p>Theme: # 1 - Empowering Conservation Through Citizen Science: Engaging Communities for a Sustainable Future (60 mins)</p> <p># 2- Impact Assessment for Environment Education Programmes (30 mins)</p> <p>Speakers:</p> <p>#1 1. Ms. Shonali Chenzira, Senior Manager, Environment Education</p> <p>2. Ms. Ambreen, Lead, Youth and Citizen Engagement programmes, WWF-India</p> <p>#2 1. Ms. Neha Raghav, Director, WWF</p> <p>2. Ms. Priyanka Singh, Manager, PMEL Education</p>	<p>UNEP</p> <p>Theme: Engaging youth through Education and Advocacy for Solutions to Plastic Pollution through UNEP's Tide Turners Plastic Initiative</p> <p>Speakers:</p> <p>I: Setting the Context</p> <p>1. Mr. Sam Barratt, UNEP Chief Youth, Education and Advocacy Unit</p> <p>2. Mr. Sumit Sharma, UNEP India</p> <p>II: Tide Turner Plastic Challenge (TTPC) India, its impact pedagogical approach - strength and weaknesses</p> <p>1. Ms. Arpan Singh, Youth Officer UNEP India, (Moderator)</p> <p>2. Ms. Ambreen Khan, Project Manager WWF</p>	<p>SWECHHA</p> <p>Theme: Intergenerational Dialogue on Re-imagining Education for a Climate Resilient Future</p> <p>Speakers:</p> <p>1. Moderator: Dr. Shilpanjali Deshpande Sarma, Program Manager, Swechha: We For Change Foundation, Malviya Nagar</p> <p>2. Ms. Khanak Gupta, Senior Secondary student, The Shriram Millennium School, Faridabad</p> <p>3. Ms. Saloni Kumari, Senior Secondary student, Government Co-ed Senior Secondary School, Munirka</p> <p>4. Mr. Samarrrth Khanna, Masters' student, Teri School of</p>	<p>South Pole</p> <p>Theme: Role of Sustainability Education in amplifying Nature based Solutions for Climate Action</p> <p>Speakers:</p> <p>1. Moderator: Sheetal Antil, Sourcing Specialist, NbS, South Asia, South Pole</p> <p>2. Mr. Arvind Boaz, Climate Consultant, DFID-CCIP-ACT</p> <p>3. Dr. Erach Bharucha, Director BVIEER, Pune</p> <p>4. Ms. Archana Chatterjee, Project Manager, IUCN-India</p>	<p>We Naturalists</p> <p>Theme: Green Entrepreneurship and its Potential in the New World</p> <p>Speakers:</p> <p>1. Mr. Madan Padaki, Strategy Advisor to UNICEF India (Chair)</p> <p>2. Mr. Amit Banka, Founder, WeNaturalists</p> <p>3. Ms. Prerna Prasad, Founder and CEO of Ecoplore</p> <p>4. Mr. Arunav Sharma, Founder & Chief Executive Officer (CEO) of Rising Sun Energy Private Limited</p> <p>5. Mr. Ajay Kumar, Co-Founder, Teach for Green</p>	<p>Oral Presentations (Abstract IDs 31 - 47)</p> <p>Chair: Dr. Suprava Patnaik, Principal Advisor, Atal Bihari Vajpayee Institute of Good Governance and Policy Analysis</p> <p>Co-Chair: Dr. Manmohan Yadav, Prof. IIFM, Bhopal</p> <p>Jury: Prof. Vinod Sharma, Professor of Sustainable Energy, Environment and Development, Indira Gandhi Institute of Development Research (IGIDR), Mumbai</p>

	<p>3. Mr. Utsav Modi, Project officer, CEE</p> <p>4. Ms. Gayatri Raghwa, Environment Education expert UNEP-India</p> <p>5. Dr. Raman, Prof., Shaheed Bhagat Singh College, Directorate of Edu., Delhi</p> <p>6. Sneha Shastri, TTPC Ambassador, PhD student</p> <p>III: Solutions to beat the plastic pollution through green entrepreneurship & jobs</p> <p>1. Ms. Anita Shankar, ASTU Eco Pvt Ltd (online)</p> <p>2. Ms. Sonal Shukla, Eco Conscious</p> <p>3. Mr. Pranav Desai, Reco Solutions</p> <p>4. Ms. Neha Shivaji Naikwade, climate-oriented start-ups and climate-tech innovations (online)</p> <p>5. Kaushik Chandreshekar, UNEP Expert</p> <p>6. Rumi Walia, Manager Youth Initiative, EDN</p> <p>7. Kaushik Chandreshekar, UNEP Expert</p>	<p>Advanced Studies, Vasant Kunj</p> <p>5. Mr. Vimlendu Jha, Executive Director, Swechha: We For Change Foundation, Malviya Nagar</p> <p>6. Mr. Richard McDonald, Executive Director, R Futures Group, Switzerland</p> <p>7. Ms. Susan Thomas, Educator & Consultant, Climate Reality Project, New Delhi (online)</p>			
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15:30 - 16:00

TEA/COFFEE BREAK

Silver Oak Foyer

<p>16:00 - 17:30</p>	<p align="center">CONCLUDING PLENARY Presentation of Summary of Sessions & Adoption of Recommendations</p> <p>Chair: Mr Pradip Burman, Chairman Mobius Foundation</p> <p>Presentation of consolidated session reports/recommendations: Ms. Anupama Madhok, Director, Water Digest</p> <p>Panel:</p> <ul style="list-style-type: none"> • Prof. G.D. Sharma, President Association of Indian Universities and V.C., Uni. of Sci. & Technology Maghalaya, Shillong • Dr. Nakul Parashar, Director, Vigyan Prasar • Mr. Alan Egbert, ACER, Dubai 	<p>Silver Oak</p>
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	<ul style="list-style-type: none"> • Dr. Neelima Jerath, Director General, PGSC • Mr. Sam Barratt, Chief of Youth, Education and Advocacy, UNEP • Mr. Deepak Jain, Chairman, DMA ESG • Ms. Karuna Singh, Regional Director, Earth Day Network • Ms. Vinitaa Apte, Founder Director, TERRE Policy Centre • Mr. Dilip Surkar, Executive Director, VASCSC, Ahmedabad 	
17:30 - 18:30	<p style="text-align: center;">CLOSING CEREMONY</p> <p>Chief Guest: Mr. Shombi Sharp, UN Resident Coordinator*</p> <p>Chair: Mr. Pradip Burman, Chairman Mobius Foundation</p> <p>Announcement & Presentation of Best Paper/Poster Awards and Certificates</p> <p>Closing Statements:</p> <ul style="list-style-type: none"> • Mr. Praveen Garg, President, Mobius Foundation • Dr. Vibha Dhawan, Director General, TERI • Ms. Abimbola Junaid, Partnerships, Advocacy & Voice Manager, Population Matters • Ms. Bethany Davies, Research Fellow, ACER • Mr. Aditya Pundir, Director India and South Asia for The Climate Reality Project • Ms. Gayatri Raghwa, Environment Education expert UNEP-India <p>Vote of Thanks: Dr. Ram Boojh, CEO Mobius Foundation</p>	Silver Oak
19:00 onwards	NETWORKING DINNER	Silver Oak Lawn
*TENTATIVE		

Thursday, September 21, 2023		
07:00 - 10:00	NATURE TRAIL	Lodhi Garden, Lodhi Road, Lodhi Estate, New Delhi



Concept Notes for Plenaries and Sessions

DAY 1
Special
Thematic
Session
1



Theme: Private Sector Engagement in Climate Action

September 19, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Silver Oak 1

Background

Climate change poses one of the greatest challenges of our time, requiring collective efforts from all sectors of society to combat its impact. The private sector, as a key driver of global economic activity, plays a crucial role in addressing climate change. This concept note outlines a proposal for the session titled “Private Sector Engagement in Climate Change” to be organized by CDP India at the International Conference on Sustainable Education. CDP is a leading international organization that drives companies and governments toward Environmental disclosure. With a vast network of over 9,600 companies worldwide, CDP encourages corporate transparency and accountability in environmental management.

About the Session

Session Format and Topics -

• Panel Discussions: Experts from various sectors will participate in interactive panel discussions on the following topics:

1. Climate Action Strategies for Businesses: Demonstrating how private sector entities can develop and implement effective climate action strategies.

2. Investing in a Resilient Future: Showcasing successful investments in sustainable technologies and projects that mitigate climate risks.

3. Corporate Social Responsibility (CSR) for Climate: Highlighting the role of CSR initiatives in driving climate resilience and sustainable development.

• Case Study Presentations: Companies with outstanding climate initiatives will share their experiences, challenges, and lessons learned, inspiring others to follow suit.

Session Objectives

1. Raise Awareness: Enhance participants’ understanding of the importance of private sector engagement in climate change mitigation and adaptation efforts.

2. Share Best Practices: Showcase successful case studies and initiatives taken by various private sector entities to address climate change challenges.

3. Facilitate Collaboration: Foster partnerships and collaborations between the private sector, civil society, and governments to accelerate climate action.

4. Promote Sustainable Education: Emphasize the role of education in empowering the private sector to integrate

climate-conscious practices into their operations.

Outcomes

The expected outcomes of the session include:

1. Increased awareness of the private sector’s role in climate change mitigation and adaptation.
2. Dissemination of best practices and successful case studies to inspire further action.
3. Establishment of new partnerships and collaborations for climate-related projects.
4. Enhanced understanding of how sustainable education can drive climate-conscious decision-making.

Programme Schedule

14:00-14:05

Ms. Shweta Basu, Manager, Corporate Engagement and Partnerships, CDP

14:05-15:00

Moderator: Ms. Prarthana Bohra, Director CDP

Panelists:

- Mr Santhosh Jayaram, Global Head – Sustainability HCL Tech
- Mr Ritesh Kumar Upadhyay, Associate General Manager, Lenskart
- Ashu Kalra, Vice President, Head of Global Corporate Real Estate and Environment Sustainability, EXL Services
- K.K. Sharma, MD, DCM Shriram
- Mr. Ajay Kumar Pillai, Risk Advisory, Deloitte, India

15:00-15:25

Case Study Presentations

15:25-15:30

Thank you note: Shweta Basu, Manager, Corporate Engagement and Partnerships, CDP

Theme: Building a Multi-Country Civil Society Partnership to increase the resilience of coastal population in South Asia

September 19, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Silver Oak 2

Background

The aim of the event is to focus on the coastal communities, who are struggling for their livelihood generation and for that unintentionally harming the local eco-system. Considering the factors such as geographical & climatic condition, income generation sources and availability of resources such as manpower, land, natural resources, etc., the implementation of the relevant project through community involvement for livelihood generation is feasible. Some of the activities under the project will include afforestation on the degraded land (Distribution of different mangrove species to the local communities will generate revenue by maintaining the nursery of the mangrove species as well as increase green cover), Use of Solar energy as an alternative for the traditional energy (solar lamp, solar cooker, solar power devices for fishing in mangroves area), Providing skill training and establishing small units of local product making, which will be operated and maintained by the community. Such activities with the involvement of the local community will facilitate income generation and aid in sustainable living.

About the Session

The session will cover the current issues of the coastal communities, their struggle for their livelihood generation. Various topics related to the climatic conditions, available resources, income generation sources, etc. will be addressed. The importance of afforestation, use of renewable energy and the skill improvement training for the local communities will be highlighted during the session. Practical solutions will be discussed by the panel on the unintentional harm caused to the local ecosystem.

Session Objectives

- Highlight the current issues faced by the coastal communities with respect to the livelihood generation.
- Addressing the need for cumulative conservation plan.
- Discussion on the practical solutions

Outcomes

If we can create awareness about the importance of the environment and show them the way we can lead a sustainable living, the community can readily change their lifestyle for the protection of the environment. As well as this people are staying very close to the Environment which need to be protected. Also promoting local products will reduce pollution in various ways.

Programme Schedule

Chair: Mr. Leonard Sonnenschein, President, Conservation for the Oceans Foundation

Moderator: Dr. Vinitaa Apte, Founder Director, TERRE Policy Centre

Panelists/Speakers:

- Mr. Thies Geertz, Program Manager, Global Nature Fund, Germany (via Zoom)
- Ms Antonella Vassallo, Managing Director, International Ocean Institute, University of Malta
- Mr. Kanna K. Siripurapu, Senior Fellow, SasiWaters
- Mr. Sunil Murlidhar Shastri, Consultant, Educator, & Speaker, Ocean and Environmental Governance (via Zoom)

Theme: Integrating Climate Change in Education Systems

September 19, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Jacranda

Background

Climate change is recognized as a critical global and national challenge by the Government of India. To address this challenge, various initiatives at both the central and state levels are contributing to collective efforts against climate change and the promotion of sustainable practices across different sectors. There is a growing need also for locally-driven actions that involve local stakeholders, authorities, governments, and communities. One effective approach to engage all stakeholders and communities in understanding and taking right decisions and climate actions is through promoting education on climate change, following the age-old environmental education principle of “catch them young”.

Climate Change Education is gaining global recognition as an essential tool to facilitate locally-driven climate actions and empower the younger generation to effectively address the looming climate crisis. Educating school children about climate change is a crucial component of fostering such local initiatives by imparting knowledge, skills, and capacities.

India's new National Education Policy (NEP) for 2020 underscores the incorporation of climate change as a primary focus within environmental education. It also rightly emphasizes experiential learning, multidisciplinary education, and the promotion of critical thinking to address the challenges of our evolving world. Since environmental education is a mandatory subject in India's formal education system, integrating climate change education into it could significantly contribute to this objective (CEE, 2023).

Education on climate change needs to be integrated in various aspects of education systems – in curriculum, co-curricular activities, school governance, operations and facilities, teachers' training, teaching resources, larger school community and local community and the overall education systems' capacity. The Greening Education Partnership (GEP), launched at the UN Transforming Education Summit in September 2022, also highlights the importance of greening education for addressing climate change through its four pillars – Greening Schools, Greening Curriculum, Greening Teacher Training and Education Systems Capacity and Greening Communities.

This session will try and capture the various initiatives on climate change education in India and globally on aspects like policies, practices and building knowledge, skills and systems capacity as well as challenges and opportunities across the gamut of education landscape, as vast as that of India. This will be deliberated from the perspectives of different stakeholders who will be invited as speakers – policy makers, education sector experts, climate experts, multi-lateral organizations, civil society organizations, teachers and youths.

Session Objectives

- Present various aspects and approaches to integrating climate change education in educational systems – curriculum, schools,

teacher training, education system's capacity (teaching aids, resources) and taking climate education and action from school to community.

- Share some of the key national, sub-national and local initiatives happening on climate change education (curriculum integration, inside and outside classroom transactions, effective pedagogies, teachers training, programmatic implementation of such initiatives and schemes engaging students, teachers, whole schools and community).
- Discuss the opportunities and challenges of climate change education and recommendations of the UNESCO State of the Education Report for India 2023 on Education to Address Climate Change.
- Discuss the Greening Education Partnership framework and explore synergies for taking it forward in India.

Outcomes

- Understanding of climate change education integration approaches including key Policies level initiatives
- Familiarity with some of the recent initiatives on climate change education in India lead by various organizations
- Familiarity with the Greening Education Partnership in promoting and scaling up climate change education
- Potential partnerships and collaborations for scaling up climate change education in India

Programme Schedule

The session will be conducted as a Panel Discussion in an interactive manner, where participants will be able to get familiar, learn, question, discuss and reflect on various aspects of climate change education in India through the diverse talks given by the speakers.

The discussions will be moderated by representatives of CEE India and UNESCO New Delhi.

Key Speakers:

1. Shri Kartikeya Sarabhai, Founder and Director, Centre for Environment Education (CEE), India
2. Prof. Sunita Farkya, Head, DESM, NCERT
3. Ms Joyce Poan, Chief of Education, UNESCO, India
4. Dr. Ramachandra Rao Begur, Education Specialist, UNICEF New Delhi
5. Ms. Olivia Copsey, Director of Education, FEE Denmark
6. Sh. Souparno Banerjee, Senior Director, EE, CSE
7. Dr. Santanu Basu, Project Director, HCL Foundation
8. Ms. Heeta Lakhani, Youth Activist and Climate Educator, Green Warriors

Theme: *Water Literacy: Water insights on climate change for a sustainable future*

September 19, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Jacaranda 2

Background

Access, to safe water, sanitation and hygiene is a human need that greatly impacts our health and overall well-being. The United Nations Sustainable Development Goal 6 (SDG6) emphasises the importance of “Ensuring Water and Sanitation for All “ recognising that water is essential for sustaining life while safe drinking water defines the essence of civilisation. However due to factors such as population growth, industrialisation and climate change the availability and quality of our water resources are under great stress.

Ensuring effective water management, minimising wastage, increasing water use efficiency and sustainability of water sources and water infrastructure have become global challenge. As per United Nations (UN), billions of people may lack access to basic water services in 2030. To reach universal access to drinking water, sanitation and hygiene by 2030, current rates of progress would need to increase fourfold. Achieving these targets would save 8,29,000 people annually, who die from diseases directly attributable to unsafe water, inadequate sanitation and poor hygiene practices.

Water scarcity and water quality degradation are critical challenges that pose significant challenges to India as well, as the country is highly dependent on agricultural, industrial, and domestic use of water resources. As per the report of World Resource Institute (WRI, 2019) 60 crore people living in India face high to extreme water crises. A 2019 report by NITI Aayog says that 40 percent of Indian population will not have access to drinking water by 2030. It mentions that five out of the world's twenty largest cities facing water stress are in India and about two lakh people in India lose their lives every year due to inadequate and unsafe drinking water, sanitation and hygiene.

Educating individuals, communities, and stakeholders about the significance of safe water consumption, responsible water use, groundwater recharge, saving water bodies, harnessing traditional water conservation methods with technologies, rejuvenating rivers and recycling & reusing treated water is paramount to achieving long-term water security and environmental sustainability.

Improving water education of all people will be essential for overcoming a host of different sustainable development challenges. Water literacy or educating for water, i.e., a focus on improving water literacy for all people - should be clearly integrated with all efforts on water.

About the Session

The session will be aimed at fostering a deeper understanding of the crucial role and impact of water in the context of climate change and sustainability.

The session will encompass a comprehensive set of initiatives

designed to address the critical need for informed water management practices. The water experts, educators, policymakers, practitioners, industry officials and end-users from water-consuming sectors (agriculture, industry, and domestic) will engage in the dialogue and knowledge exchange on water-related challenges and solutions.

Through a combination of presentations, interactive discussions, sharing and disseminating best practices & project case studies, the session aims to empower participants so that they could contribute to sustainable water management in their respective fields, which can further play a role in catalysing transformative actions and initiatives that contribute to India's SDG goals.

Session Objectives

The overall objective of the session is to bridge the gap between “knowledge and action” by equipping participants with the “information and motivation” needed to contribute to effective water management practices and a sustainable future.

Following are the primary objectives of this session:

- 1) Awareness Amplification on the Urgency of Taking Actions: To increase awareness among masses by inspiring the leaders and influencers about the critical importance of water management and sustainability.
- 2) Contextual Understanding of Climate Resilience and Role of Water: To provide participants with an in-depth understanding on the relationship between water management and climate change, changing precipitation patterns, groundwater depletion, stress on water bodies and extreme weather events.
- 3) Empowering Youth to Shift from Dialogue to Action: To empower young participants with practical knowledge, tools, and resources on sensible and smart water management by using sustainability principles in policies, practices, and awareness campaigns.
- 4) Behavioural Changes to Encourage Actionable Sustainable Practices: To inspire participants to adopt responsible water consumption behaviour by sharing success stories of water crusaders on sustainable water management (efficient water use, water conservation, uniting communities, wastewater treatment, and pollution prevention).
- 5) Promoting Integrated Approach: To promote Integrated Water Resource Management (IWRM) - highlighting the importance of collaboration among stakeholders from industry, agriculture, urban planning, and environmental conservation.
- 6) Community Engagement: To discuss strategies to engage local communities, schools, NGOs, and grassroots organizations to promote water education.

7) Encouraging Innovation: To encourage the development and application of innovative water treatment methods, digital tools, and technologies.

8) Policy Recommendations: To assimilate the insights and recommendations for policymakers to integrate water education into national and regional policies.

Outcomes

The session will serve as a platform for knowledge sharing, collaboration, and inspiration, with the ultimate goal of equipping young participants and organisations with the tools and motivation to drive positive change in their water management practices.

By encouraging and promoting informed discussions, sharing best practices, fostering partnerships and generating policy recommendations, the session will also strive to contribute to advancing water education – assisting in India’s journey towards becoming a water-secure nation, thus, achieving its Sustainability Development Goals (SDGs) within the stipulated timeframe.

Programme Schedule

Opening Address:

Ms Anupama Madhok Sud, Director & Editor,
Water Digest

Special Address:

Shri G. Asok Kumar, IAS, Director General, National
Mission for Clean Ganga (NMCG)*

Panelists/Speakers:

Shri R.S. Tyagi, Expert Advisor - National Institute of
Urban Affairs (NIUA), Ex-Member - Delhi Jal Board
(DJB)*

Mr Anshuman, Director, Water Resources Division,
TERI*

Ms Anjali Makhija, Chief Executive Officer, S.M. Sehgal
Foundation

Ms Arya. V, Ph.D. Assistant Professor, Department of
Civil Engineering, Indian Institute of Technology Delhi

Dr Jagdish Kumar, Senior Assistant Director & Chief,
Shriram Institute for Industrial Research

Vote of Thanks

DAY 1
Special
Thematic
Session
5



Theme: *Closing the Loop: Empowering Climate Action through Circular Economy Education*

September 19, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Magnolia

Background

Circular economy (CE) has emerged as the new economic model that tries to overcome the current production and consumption based on a so-called “linear economy” (take, make and dispose of model). CE is aimed at a systemic transformation of current economy wherein the value of products, materials and resources are maintained in the economy for as long as possible, the generation of waste is minimized and a sustainable, low carbon, green, resource-efficient and competitive economy is established. As circular economy strategies reduce the demand for raw materials and new products, they can help reduce global emissions from half of the global total that come from the extraction and processing of materials. The sectors such as civil construction, transport, and the food system show the most promise for circular economy strategies to reduce emissions from production, use (in terms of energy used for heating, cooling, and fuelling) and disposal (when they are sent to the incinerator or the landfill). Instead of recycling at the end of materials’ life cycle, upstream strategies that include shifting consumption patterns and designing products that use materials more efficiently have the highest potential to reduce emissions.

Lack of know-how is a significant obstacle in the transition towards sustainability. If a person does not know how to act differently, it is easier to continue ‘as I always have done’. Education and awareness for circularity require interdisciplinary teaching, not just the transfer of theoretical knowledge, but above all, the development of socially and ecologically appropriate attitudes. It can empower individuals, organizations, and policymakers to make informed choices that support climate action by reducing greenhouse gas emissions, conserving resources, minimizing waste, and promoting sustainable practices.

“Closing the Loop: Empowering Climate Action through Circular Economy Education” is going to be an important session to disseminate much needed education about barriers, multifaceted approaches and practices being followed to enable transition from linear to circular economy. The session will not only give access to different case studies and practices being followed to create a circular model, but also serve as a platform to provoke thoughts aligned with the climate action and sustainability.

Objective

The objective of this thematic session is to utilise education as a powerful tool to disseminate information, awareness and knowledge related to multiple approaches being envisaged/practised to enable much needed transition from Linear to Circular. It aims to facilitate a meaningful exchange of knowledge, experiences, and best practices among participants, focusing on the importance of shaping sustainable mindsets, and equipping individuals with the necessary skills to drive circular economy practices.

Outcomes

The session intends to achieve the following outcomes:

Knowledge Sharing:

Participants will gain insights into the various educational approaches, strategies, and initiatives that have proven effective in promoting circular economy principles. By understanding the principles and importance of a circular economy, individuals, businesses, and policymakers can recognize the connection between their actions and climate change.

Collaboration and Networking:

The parallel session will provide a platform for educators, researchers, policymakers, and industry professionals to connect and collaborate. Participants will have the opportunity to engage in discussions, share ideas, and establish partnerships, fostering a global network of stakeholders committed to advancing circular economy education.

Best Practice Identification:

Education on circular economy principles can encourage businesses to adopt sustainable production practices. By embracing circular business models, companies can reduce their carbon footprint and contribute to climate action.

Awareness and Advocacy:

The parallel session will foster a collective understanding of the significance of circular economy education in addressing global challenges. Through education, individuals can engage in discussions, advocate for policies supporting the circular economy, and participate in collective efforts to address climate change challenges.

Program Schedule on next page



Programme Schedule

14:00-14:05

Introduction and Welcome by Moderator, Dr Avik Mukherjee, Dean R&D, CIT Kokrajhar

14:05-14:10

Opening remarks by Dr. Vimal Katiyar, Professor & Dean-Research and Development, IIT Guwahati. Coordinator, CoE for Sustainable Polymers & Sustainable Materials

14:10-14:25

Dr Santosh Kumar, Asst. Professor and HOD - Dept. of Food Technology, CIT Kokrajhar

14:25-14:40

Dr. Manoranjan Hota, Advisor, Skill Council of Green Jobs, New Delhi, Ex. Advisor, MoEFCC, Govt. of India

14:40-14:50

Mr. Bhaskar Lath, Sr. Manager - Business & Strategy, ReCity, Mumbai

14:50-15:05

Mr. Prabhjot Singh Sodhi, Senior Programme Director (Circular Economy) Centre for Environment Education, Ahmedabad

15:05-15:20

Dr. Vimal Katiyar, Professor & Dean- Research and Development, IIT Guwahati

15:20-15:30

Open session- Questions, answers & recommendations
Vote of Thanks

Theme: Women writers in Sustainability: Old Dilemmas, New Realities

September 19, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Maple

Background

Research from the CARE-WWF Alliance shows that empowering women can reduce environmental damage, especially when they are engaged in natural resource management and conservation leadership positions.

While the U.N. estimates a staggering 80% of people displaced by climate-related impacts are women, they are least represented in leading our research. A woman on the field can empathise better with the issues being faced by the community at large, leading to a greater understanding of issues. However, in conservation and natural resource management, as in many business and academic endeavours, men are often elevated in areas like fieldwork and leadership, while women are often assumed to be better fits for support roles and “softer” jobs like communications and administration. It is imperative to emphasise the vital contribution of women in the research and field work in sustainability, particularly while examining the role of education in driving climate action and sustainability through behavioural change in communities. In this session, Greenlitfest attempts to bring forth the challenges and opportunities faced by women, who have varied and extensive experience on the field.

Greenlitfest (GLF) was launched in June 2021, by a team of writers and green enthusiasts, with the purpose of mainstreaming knowledge and dialogues on environment, climate change and India’s preparedness for them. It is India’s first platform dedicated exclusively to identifying, celebrating, and promoting books, writing, conversations, and various other cultural expressions on the environment for people of all ages.

About the Session

This thought-provoking session asks prominent women working across various areas in sustainability, how gender plays out in their careers and what are their observations about the lives of people on the field, as viewed from their own unique lens. From psychological to physical challenges, does gender have a bearing on their work? If it does, how do they deal with it? Are they able to impact and impart information to communities more easily, because they may have greater access to women who could enable and sustain changes in a household, as compared to their male counterparts?

This unique session will surely leave the audience with some much-needed food for thought, and sensitise them to the reality of working on the field, and the role they can play to turn things around.

Session Objectives

- To look at the role of gender within careers in sustainability.
- To understand real-time challenges and opportunities for

women in this field.

- To understand how women researchers can leverage the advantage of having the confidence of communities for educating for climate action and sustainability

Outcomes

Even though we live in a time when many people are aware of the dire need for sustainability and interested in pursuing it professionally, realities on the ground remain unfamiliar.

This session intends to achieve the following outcomes:

Knowledge Sharing:

Audience will gain insights on what it means to be a woman working in sustainability - challenges, best practices and breakthroughs in building a more inclusive space.

Best Practice Identification:

How education plays a role both as an enabler and as a tool to make a success of their chosen path.

Awareness and Advocacy:

The session will foster a collective understanding of the significance of education in bringing about a shift in the attitude, both of organisations and of people on the ground for supporting more women to participate in fieldwork, research and educating for climate action and sustainability.

Key Speakers

1. Ms Megha Gupta, Head, Youth programme at the Green Literature Festival
2. Ms Donna Goodman- Founder Earth Child Institute, USA
3. Ms Meena Raghunathan- Environment Educator, Author
4. Ms Neha Sinha, Conservation Biologist, Author and Columnist
5. Ms Neha Dara, Head Round Glass Sustain
6. Ms Kavitha Iyer, Journalist & Editor
7. Ms Aparna Karthikeyan, Journalist and Senior Fellow, People’s Archive of Rural India

VIRAM: Agenda Sustainability Population, Climate Action and Sustainable Development - Role of Education & Empowerment

September 19, 2023 | Time: 16:00-17:30 hrs (GMT +5:30) | India Habitat Centre, Stein Auditorium

Background

Over the past five decades, global population has doubled, the extraction of materials has tripled and gross domestic product has quadrupled. The extraction and processing of natural resources has accelerated over the last two decades, and accounts for more than 90 per cent of our biodiversity loss and water stress and approximately half of our climate change impacts. Over these last 50 years we have not once experienced a pro-longed period of stabilization or a decline in global material demand. (Ref: Global Resource Outlook)

According to global projections by the United Nations' International Resources Panel, less than one-third of the anticipated increase in the use of natural resources till 2050 would be the result of population growth, while the remaining (more than two third) would be due to increase in per capita consumption with rising prosperity. Limiting unsustainable patterns of production and consumption will be essential to achieve SDGs.

More than half the world's population today live in cities, and another 2.5 billion people are expected to join them by 2050. The frequency of torrential rain and storm surges is on the rise in big, densely populated cities like New York, Mumbai and Jakarta, hitting those living in marginalized, informal settlements like slums the hardest. Desertification swallows arable land needed to feed swelling urban populations. And sea level rise threatens everyone living in coastal areas, delta regions, and small-island countries.

Climate change is the foremost crisis of the 21st century, with devastating environmental, economic, and social impacts. It has specific direct and indirect impacts on girls and women and gender-diverse people, affecting the realization of their human rights, including their sexual and reproductive health and rights (SRHR). Unequal power relations and historical and structural inequalities have created barriers to gender equality, including limited access to financial and other resources needed to adapt to climate change and maintain good health.

Efforts to address climate change must take an intersectional approach because climate change impacts each person differently depending on their race, ethnicity, citizenship status, migrant status, refugee status, class, socioeconomic status, disability, age, geographical location, and sexual orientation, gender identity, and/or gender expression.

Need For Climate Action and Sustainability

While women and girls experience disproportionate impacts from climate change, risks are grave for older women, women and girls with disabilities, migrant women, and those living in rural, remote, conflict and disaster-prone regions. Climate action and sustainability are critical issues that require immediate global

attention and collective efforts. However, by placing women at the centre of climate action, we can create a more sustainable and equitable future for all. Education plays a crucial role in raising awareness, fostering understanding, and driving positive change. To maximize the impact of education on climate action and sustainability, it is essential to prioritize the integration of these topics into formal and informal education systems, involve diverse stakeholders, and promote interdisciplinary approaches. By empowering individuals and communities with knowledge, skills, and a sense of responsibility, education can foster a sustainable future for generations to come.

Objectives

The overall objective of the session is to trigger a dialogue among the participants by sharing knowledge, experience and challenges due to climate change, and making recommendations, keeping women and girls at the centre of discussion.

- To understand and highlight how climate change affects girls and women. Understanding key challenges that girls and women face in the wake of climate change and natural disasters.
- To discuss and share how sustainable and resilient practices and solutions on climate action and sustainability can help women to cope up with the challenges. Share selected good practices and community-based approaches from the field.
- To identify strategies that promote awareness among adolescent girls on climate action and sustainability to prepare them to cope up with their vulnerability.
- To make recommendations for policy makers, educators, civil society organisations (CSOs) and communities to mobilize collective climate actions and sustainability in favour of girls and women.



Programme Schedule

Plenary Session 2 : September 19, 2023

16:00 – 16:05

Inaugural welcome by the emcee introducing campaign

16:05 – 16:10

Opening remarks by Mr. Pradip Burman, Chairman, Mobius Foundation

16:10 – 16:40

Introduction of moderator and panelists by emcee

Panel Discussion - English

Title - Climate Action, Sustainability and Population Dynamics : Placing Girls and Women in focus

- Ms. Poonam Muttreja, Executive Director, Population Foundation of India
- Mr Alistair Currie, head of campaigns and communications, Population Matters, UK
- Ms. Nandita Bajaj, Executive Director, Population Balance, USA
- Mr. David R.T Richardson, CEO, Population Crisis, UK

16:40 - 16:45

Audience open questions to panelists

16:45 – 16:50

Break/ Changeover

16:50 –17:20

Introduction of moderator and panelists by emcee

Panel Discussion - Hindi

Title - जनसंख्या, जलवायु, और जीवन

- Dr. Govind Singh, Dean Research Studies, Indian Institute of Mass Communication, Delhi
- Dr. Ram Boojh, CEO, Mobius Foundation
- Ms. Huma Masood, Senior Gender Specialist, UNESCO-India
- Akash Ranison, Environmentalist and Social Media influencer with over 45.8k followers

17:20- 17:25

Audience open questions to panelists

17:25- 17:30

Closing remarks Dr. Ram Boojh

17:30-17:35

Closing address by emcee

Theme: Moving towards Sustainable Development through Mission LiFE (Lifestyle for Environment)

September 20, 2023 | Time: 11:30-13:00 hrs (GMT +5:30) | India Habitat Centre, Silver Oak 1

Background

It is encouraging to know that India’s carbon footprint is less than 60% of the global average. The credit for this goes to our deep-rooted ethos for sustainable living and our respect for nature. However, the demerits of globalization have touched our lives too and have made us deviate from our environmentally sustainable practices. The indiscriminate use and rejection of plastics, wastage of natural-resources, lack of waste management, increase in e-waste/ medical waste, injudicious use of chemicals in agriculture, textiles, etc. are some of the major issues causing concerns. To check these, it is important that we adopt measures which bring out a behavioural change towards use of unsustainable practices and makes us pro-planet. The Mission LiFE introduced by our Honourable Prime Minister Shi Narendra Modi, is one big step in this direction. It is India-led global movement targeting to make people adopt lifestyles which are sustainable and environment-friendly. To bring about a fundamental shift, Mission LiFE is conceptualized as a tri-phasic activity: targeting demand, supply and policy. It will entail formal, non-formal and informal nudges to people to bring about the required behavioural shift, transform demand-supply chain, focusing on judicious use of resources and production as per the demand and bring about policy change keeping in view the transformation required in production and consumption cycles. Increasing the resource-use efficiency by enhancing life cycle of a product and optimizing use of natural-resources, encouraging the concept of reduce, reuse and recycle will thereby promote circular over linear economy. NitiAyog, Government of India had rolled out a competition pan India where innovative ideas were invited to adopt best Lifestyles for Environment (2023). 75 best ideas were selected, published and awarded (<https://www.niti.gov.in/sites/default/files/2023-06/Thinking-For-Our-Planet-75-Ideas-to-Promote-LiFE.pdf>) . The Energy and Resources Institute (TERI), a global Think tank was also amongst the selected 75 entries.

Lifestyle for environment has more relevance to our young generation (both children and youth) as they are the worst affected. It is important to understand and acknowledge the issues and the impact they have on them. We need to deliberate upon environment-friendly and sustainable Lifestyle that the GenZ, Alpha and subsequent ones can adopt as the actions of today will decide the life in future.

About the Session

TERI has invited eminent speakers and representatives from educational-, environmental-, spiritual-, government institutions; winners of Mission LiFE; etc. to discuss and share their experiences and initiatives related to Mission LiFE and to illuminate the way forward. This shall give a broad perspective to the topic and shall help understand the same holistically. Environment sustainability issues require creating awareness as well as behavioural change in different segments of the society. The Mission is stated to touch 1 billion Indian and global citizens

to undertake actions to protect and conserve environment either individually or collectively to make a tangible impact on the environment. The diverse panel shall deliberate upon the why and how of the target to be achieved.

Session Objectives

As we are aware that children and youth are the worst affected by climate change. The session will aim to:

- Bring out the work that is being carried out in different sectors around children/ youth and environment sustainability.
- Highlight adequacy/ inadequacy of existing policies and policy interventions required to bring out effective changes to have the desired impact through the mission.
- Identify concrete steps to have a greater sensitization and outreach to students and youth.
- Interventions required to achieve the objective.

Outcomes

- Plan of action for next few years for implementation at schools, colleges and community levels.
- Increased sensitization and mobilization of communities to adopt Mission LiFE.

Programme Schedule

11:00-11:30

Welcome Address and Introduction to the session’s objectives by Dr. Livleen K. Kahlon

11:30-12:30

Panel Discussion

“Sustainable Development through Mission LiFE (Lifestyle for Environment) with Children and Youth in perspective”

- Dr Neha, Senior Fellow, Strategic Communication for Sustainability, TERI (Moderator)
- Mr. Anshuman: Winner of Mission LiFE
- Ms Saumya Sil, Revenue Officer (WBCS) Dept. of Land reforms and Land Revenue & Refugee and Rehabilitation Govt. of West Bengal
- Ms. Shashi Banerjee, Director, Shiv Nadar Schools
- Shri Rupeshvara Gaurang Das, From ISKCON, Lifestyle Coach, Motivatioal Speaker, Counsellor and Guide
- Dr. Amit Tutega, Founder, Connecting Dreams Foundation

12:30-13:00

Q & A session to address queries from the audience
Conclusion and Key Takeaways

Theme: Teaching Disciplined Entrepreneurship to Create 100 New Sustainability Ventures

September 20, 2023 | Time: 11:30-13:00 hrs (GMT +5:30) | India Habitat Centre, Silver Oak 2

Background

The Sustainability Mafia is India's leading climate action community of more than 70 sustainability focussed founders who are leading the charge toward a greener future! We want to make sustainability the default choice for everyone.

About the Session

This session is designed to ignite a transformational dialogue by bringing together two powerful pillars of change: premier university professors and academic directors, and visionary investors focused on climate startups. Together, we want to embark on an expedition to unveil the Sustainability Ventures Program—a pioneering initiative with a mission to inspire and equip students to take on sustainability challenges as entrepreneurs.

Session Objectives

Our objectives for this session are ambitious, reflecting the urgent need for action and innovation in the realm of sustainability:

- **Unveil Sustainability Ventures:** Present the problem statement, mission, vision, and rationale behind the Sustainability Ventures Program.
- **SusMafia's Unique Position:** Explain why SusMafia is uniquely positioned to spearhead this initiative.
- **Diverse Perspectives:** Elicit opinions and thoughts from the panelists, representing academia and investment, on the importance and potential of this program.
- **Guiding Principles:** Discuss the key principles that should guide our journey, ensuring sustainability, inclusivity, and impact.
- **Collaboration:** Explore ways in which academia, investment, and various stakeholders can collaborate to turn this visionary program into a thriving reality.
- **Real-World Success Stories:** Share compelling live case studies from participants in the program, demonstrating how this initiative has already begun to shape the future.
- **Inspiration and Commitment:** Inspire attendees to take action, commit to fostering sustainability ventures, and actively participate in this endeavour.

Outcomes

From this session, we anticipate the following outcomes:

- **Strategic Alliances:** The groundwork for collaborations among academia, investors, and SusMafia will be laid, fostering an ecosystem for sustainable entrepreneurship.
- **Concrete Commitments:** Tangible commitments from individuals, institutions, and organizations to support and engage with the Sustainability Ventures Program.
- **Actionable Insights:** Valuable insights and recommendations for refining and expanding the program.
- **Visionary Thinking:** A collective vision for the future, where sustainability ventures thrive, driven by disciplined entrepreneurship.
- **Pathway to 100 Ventures:** A clear roadmap outlining how we intend to achieve the goal of creating 100 new sustainability ventures.

Key Speakers:

1. Tarun Gangwar, Academic Director, Master's Union
2. Sreyashee Das, CEO, AIC Sangam Ventures
3. Prof. Jay Dhariwal, Assistant Professor, Department of Design, IIT Delhi
4. Prof. Vimal Katiyar, Dean, R&D, IIT-Guwahati
5. Arjun Gupta, Director, Sustainability Mafia
6. Saksham Bansal, Eco-Officer, Sustainability Mafia

Theme: Education Challenge to Embed Ecosystem Restoration into Educational System Worldwide

September 20, 2023 | Time: 11:30-13:00 hrs (GMT +5:30) | India Habitat Centre, Jacaranda 1

Background

As humanity faces a multitude of challenges, from climate change to social inequality, education must play a critical role in equipping the next generation with the knowledge, skills, and values to overcome these complex issues and create a better future. One of the key challenges we face is ecosystem degradation. The UN Decade on Ecosystem Restoration calls for the protection and revival of ecosystems worldwide, to halt degradation and restore them to achieve global goals. This decade runs from 2021 to 2030, which is also the timeline scientists have identified as the last chance to prevent catastrophic climate change.

To work towards the goals and vision of the UN Decade on Ecosystem Restoration, the UN Decade Strategy Group has approved the UN Decade Action Plan, setting out the next steps for collective action. The Action Plan identifies 12 priority areas for partners to mobilize and proposes 30 Restoration Challenges to achieve the UN Decade's goals. Acknowledging that education is essential in ensuring that future generations understand the value of nature and appreciate its importance, the Education Challenge 6.1 aims to embed ecosystem restoration education (ERE) into formal and non-formal education systems worldwide by 2030 as a critical element of Education for Sustainable Development (ESD). The aim is to develop a framework aimed at broad actions to map existing initiatives, build a common agreement on quality lifelong learning outcomes for #GenerationRestoration and work towards embedding Ecosystem Restoration into formal and non-formal educational settings synergistically with the UN-led Greening Education Partnership.

Coordinated by a consortium of the Foundation for Environmental Education (FEE), the North American Association for Environmental Education (NAAEE), and the United Nations Educational, Scientific and Cultural Organization (UNESCO), the challenge requires the collective effort of governments, educators, students, and communities worldwide to embed ecosystem restoration into our education systems. By doing so, we can create a future where everyone has the knowledge and skills to protect and restore our planet's ecosystems, ensuring a healthy and sustainable future for future generations.

About the Session

The session aims to present the Education Challenge and invite inputs to map projects that contribute wisdom to develop the action plan and set the scope of Restoration Education.

Session Objectives: Create awareness of the Decade, present the education challenge and identify existing good practices and experiences in restoration education.

Outcomes

More aware of the Education Challenge and Partnerships

Key Speakers:

1. Dr Pramod Sharma, Senior Director, Foundation for Environmental Education (FEE)-(via zoom)
2. Ms Radhika Suri, Senior Programme Director, Global Networking and Early Childhood Education, CEE
3. Mr Oisín Gill, Consultant, Education for Sustainable Development, UNESCO-(via zoom)
4. Mr Arnau Macià Pou, Coordinator & Project Manager, Foundation for Environmental Education (FEE)-(via zoom)
5. Mr Harcharan Singh Rumana, Co-Lead Biodiversity, Afforestation Wetland Conservation at National Mission for Clean Ganga (NMCG)

Theme: Sustainability Education - Role of Schools, Colleges and Universities

September 20, 2023 | Time: 11:30-13:00 hrs (GMT +5:30) | India Habitat Centre, Jacaranda 2

Background

In a border sense, “Sustainability” has been defined as a social goal about the ability of people to co-exist on Earth over a long time. In the contemporary time when the climate change and environmental pollution is transforming the way of human life, it is essential to draw the attention of larger population towards the sustainable practices. For successful implementation of this mission, the concept of sustainability and sustainable practices need to be inculcated into the mind of the younger generation at an early stage. Therefore, it is of utmost importance that the curriculum and respective pedagogy may be developed in a systematic manner to attract younger generation. In the present thematic session, experts from different working groups (technical experts, school/college teachers and policy makers) will come together to brainstorm on the concept of sustainability in education.

About the Session

The session will host four technical lectures (30 min each) on the proposed thematic topic Sustainable Education –Role of University, College and schools followed by a panel discussion (30 min) with the experts.

Session Objectives:

1. To bring the experts from different working groups to a common platform.
2. To understand the promoters and constraints of the induction of sustainability education in various levels.
3. To deliberate, debate and propose tangible goals for the sustainability education sector.

Outcomes:

1. To induce the importance of sustainable development goals into the minds of younger generation through their peers.
2. To design a roadmap for induction of sustainability education into the curriculum.
3. To facilitate the industry / academia interaction to work jointly and in holistic manner on sustainability.

Key Speakers/Panelists:

1. Dr. B. C. Sabata, Add. Director (R & D), KIIT Deemed University - Moderator

2. Dr Hiroko Shibakawa, Assistant Professor ESD Promotion Centre Graduate School of Education, Okayama University, Japan
3. Dr. A. K. Suar, Ex-Chief Engineer, Odisha Pollution Control Board, Expert member
4. Dr. Subrat Kumar Panigrahi, Principal, Saraswati Degree Vidya Mandir, Berhampur, Odisha, Expert from College Education
5. Dr. Suraj K. Tripathy, Associate Dean, School of Chemical Technology, KIIT Deemed University

Principal’s Conclave:

6. Dr. Jyoti Arora, Principal, Mt Abu School, Rohini, Delhi, Expert from School Education
7. Dr. Monika Mehen, Principal, DAV School, Dwaraka, Delhi, Expert from School Education
8. Dr. Sankar Narayan Bej, Principal, Khandadeuli High School, Ganjam, Odisha
9. Shailendra Kumari, Principal ODM Global School Bhubaneswar

Theme: Science, Technology and Innovation for Sustainable Development Living

September 20, 2023 | Time: 11:30-13:00 hrs (GMT +5:30) | India Habitat Centre, Maple

Background

The ecological backlash of unsustainable development by humans is manifested through pollution, climatic calamities, degradation of natural resources which, in turn, influence the overall quality of life. One of the main reasons for such deleterious effect is due to human activities driven by enhanced & unsustainable consumption patterns. In this context, there is a global consensus for rethinking and redesigning of our thought processes, values and activities that aim for 'Sustainable Living' through reducing demand of the human being on natural resources by participation of all, both at personal and community levels, with suitable replacement(s)/alternative(s). This is also manifest in the Mission LiFE of Govt. of India.

Students today can shape the world of tomorrow by driving innovative solutions to the challenges our world is facing. PGSC is working relentlessly for creating scientific temper and environment awareness among the students so that the benefits of S&T and the understanding of Sustainable Development percolate to the masses. PGSC proposes to organize "Innovation for Sustainable Development Challenge" in collaboration with National Museum of Natural History, New Delhi (for which talks have been initiated) at the "5th International Conference on Sustainability Education (ICSE)".

About the Session

The focal theme of the competition will be Science, Technology & Innovation for Sustainable Living. The competition will focus on three SDG Goals - clean water; affordable and clean energy and climate change. Students (in the age of 13 years to 16 years) from schools of Punjab & Delhi will be invited to undertake action projects in their school/home/locality and submit the results to PGSC on prescribed Google form which will be evaluated by a team of experts. Best 25-30 entries/teams will be shortlisted for poster presentation on 20th September 2023. Each team would comprise of not more than 2 students. The posters will be evaluated on 20th September from 9:30 am – 11:00 am. Best 3 projects would be presented after the expert talks during the session at 11:30 am – 1:00 pm.

Winners will be awarded attractive cash prizes and Mementos. All participating students and Teacher Mentors will be given a Certificate of Participation.

Session Objectives

- To motivate children to apply scientific understanding in day-to-day decision-making and design and develop approach and / or solution for tapping potentials and overcoming the challenges.
- To encourage children to take transformative initiatives to

community and society.

- To encourage children to visualize the future of the country and help building generations of sensitive, responsible citizens.

Outcomes

It is expected that >200 students will be involved in the process. These would be ambassadors of the environment crusade and influence their peer group and families. Thus, the session will have a multiplier impact.

Programme Schedule

11:30 - 12:00

Talks by:

- Dr. Neelima Jerath, Director General, PGSC
- Mr. Shubham Tandon, Project Officer-Resilience, Action for Climate & Environment (ACE) Unit, UNDP, New Delhi

12.00 - 12:15

Address by Session Chair: Ms. Namita Gupta, Adviser/Scientist-G & Head of "Innovation in Science Pursuit for Inspired Research (INSPIRE), DST, Govt. of India

12:15 - 12:20

Announcement of Awards

12:20 - 12:40

Presentation by awardees (only 3, 5-7 minutes each)

12:40 - 12:50

Discussion (Q & A)

12:50 - 12:58

Prize Distribution

12:58 - 13:00

Vote of Thanks

Theme: (Part 1) Empowering Conservation Through Citizen Science: Engaging Communities for a Sustainable Future

September 20, 2023 | Time: 14:00-15:00 hrs (GMT +5:30) | India Habitat Centre, Silver Oak 1

Background

In our fast-changing world, taking care of the environment is everyone's responsibility, whether it is educators, education boards, parents, students, or citizens. Citizen science offers individuals, who are non-specialists, the opportunity to connect with, explore, and learn from nature, while also contributing to scientific research led by scientists. By collecting species observations and other data, citizens can support scientists in data collection and aid in conservation. Citizen science, in turn, engages young people with nature, improves their scientific knowledge, and makes them more responsible for the environment.

About the Session

This session aims to delve into the significance of citizen science within the purview of conservation. It will explore how citizen science has revolutionized data collection, research, and community engagement. Using WWF-India's citizen science initiatives as examples, the session will showcase the impact of citizen science on conservation outcomes, how citizen science empowers individuals to actively protect their natural surroundings, and the opportunities available for people to engage in citizen science projects.

Session Objectives

1. Understanding Citizen Science: Explore what citizen science is and how it has evolved over time. Learn why it matters for safeguarding nature and how it is used in conservation work.
2. Getting Involved: Explain how everyday people help by collecting important information and adding to what we know about nature. Explore how various conservation organizations, scientists, and local communities can work together to protect nature in a complete way.
3. Examples of Success: Showcase examples of successful citizen science projects, such as the Dragonfly Festival and biomonitoring surveys.
4. Existing Citizen Science Tools: Discover citizen science websites like eBird and India Biodiversity Portal. Understand how these tools have been used to report on local environmental issues and suggest practical solutions.

Outcomes

By the end of the session, participants should be able to:

1. Explain the concept of citizen science in the realm of conservation and envision the role of empowered citizens in

shaping the direction of environmental conservation.

2. Recognize the transformative potential of involving citizens in data collection and analysis.
3. Understand how citizen science projects can lead to informed decision-making and policy change.
4. Feel motivated to initiate or participate in citizen science projects within their own organizations or communities.

Key Speakers/Panelists:

- Ms. Shonali Chenzira, Senior Manager, Environment Education
- Ambreen, Lead, Youth and Citizen Engagement Programmes, WWF-India

Theme: (Part 2) Impact Assessment for Environment Education Programmes

Time: 15:00-15:30 hrs (GMT +5:30)

Background

The Living Planet Report, WWF's flagship publication published every two years, shares alarming findings in its 2022 edition. There has been an average decline of 69% in species populations since 1970. This data spotlights starkly the interlinked double emergencies—human-induced climate change and biodiversity loss—that threaten the wellbeing of our planet and its people. Our planet is in a state of emergency, and we urgently need to shift gears to turn things around. Environment Education (EE) has emerged as one of many solutions that can contribute to turning the tide of climate change. Since 1991, in India, the Supreme Court mandated that EE be included at all levels of education. The Indian government incorporated EE in the school syllabus from 2004-05. Since then, many Environment Education programmes and interventions have been conceptualised and executed. The major goal of Environment Education is to inculcate knowledge, skills, behaviour, attitude and environmental values in children alongside fulfilling the goals of mainstream education that mostly focuses on literacy and numeracy skills. There are not yet enough data and studies available to clarify the impact that environment education programmes have as attitude and values are usually abstract in nature and long-term.

About the Session

Impact Assessment is an important component of any programme as it helps to enhance accountability and guide programme designs and policy decisions. But the big question



is—how can we study the impact of any environment education intervention, given the complexities around its measurement? It is important to have documented evidence—reports, to back the study of the programme’s impact on stakeholders with respect to its quality, efficiency, and effectiveness.

At WWF-India, recognizing the role of children and youth as major stakeholders and to design and reinvent the Environment Education programme, a robust M&E strategy was included as an integrated part of all WWF-India’s programmes and interventions. This session will cover different metrics of evaluation for assessing EE programs, tools used to cover both qualitative and quantitative data, and modes of evaluation, showcasing the results of some of our EE programmes and the challenges faced while conducting evaluations.

Session Objectives

- Highlighting the importance of impact assessment for EE Programs through qualitative and quantitative study.
- Describing the methodology of monitoring, measuring, and evaluating EE impacts through case studies, measurement indicators, metrics and developing effective tools of evaluation.
- Uncovering the challenges of evaluating EE programmes in the context of the diversity of Indian audiences, and how we can mitigate these challenges.

Key Speakers/Panelists:

- Neha Raghav, Director, WWF
- Priyanka Singh, Manager, PMEL Education

Theme: Engaging Youth through Education & Advocacy for Solutions to Plastic Pollution through UNEP's Tide Turners Plastic Initiative

September 20, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Silver Oak 2

Background

UNEP's Tide Turner Plastic challenge (TTPC) is a global initiative engaging youth across the country to address the issue of plastic pollution threatening life in oceans, rivers and on land across 40 countries. The initiative seeks to educate young individuals on single use plastics leading to action that will reduce land and marine plastic pollution. It also aims to motivate them to alter behaviour and norms around plastic usage at both individual and community levels.

The Tide Turner Plastic Challenge is in its fifth phase in India and since its initiation in 2019, has seen participation from more than 5.5 lakh youth from across all states of India. The 5th phase of this initiative is on and now has support from government authorities, youth organisations and associations. It has proved to be very popular among the youth.

While this initiative is run in over 40 countries, India stands first in terms of the number of youth participation and ground level impact.

CEE India and WWF have been the implementing partners for this initiative and have greatly contributed to the success of this initiative in India.

The impact and learning from of this initiative are worth sharing both in terms of concrete and measurable ground level solution and dissemination of knowledge and awareness at a mass scale in the community. The pedagogical approach taken by this initiative has been unique and has largely contributed to its success.

Session Objectives

UNEP at 2023 ICSE session, would like to discuss the complex issue of plastic pollution and the solutions to this pollution as advocated by TTPC youth. The session will be conducted jointly by UNEP/ CEE and WWF and will highlight the following through panel discussion and expert presentations.

- Rationale behind initiating this initiative.
- Format and pedagogical approach taken towards this initiative.
- Qualitative and quantitative Impact of this initiative.
- Showcase Solutions to beat the plastic pollution through green entrepreneurship and opportunities to work with the waste management sector for youth.

Programme Schedule

Part I

Setting the Context:

1. Mr Sam Barratt, UNEP Chief Youth, Education & Advocacy Unit
2. Mr Sumit Sharma, Programme Officer, UNEP India

Part II

Tide Turner Plastic Challenge (TTPC) India, its impact pedagogical approach - strength and weaknesses:

1. Ms. Arpan Singh, Youth Officer UNEP India, Moderator
2. Ms. Ambreen Khan, Project Manager WWF
3. Mr. Utsav Modi, Project officer CEE
4. Ms. Gayatri Raghwa, Environment Education expert, UNEP-India
5. Dr. V A V Raman, Prof Shaheed Bhagat Singh College Directorate of Education Delhi
6. Sneha Shahi, TTPC Ambassador and PhD student

Part III

Solutions to beat the plastic pollution through green entrepreneurship and jobs:

1. Ms. Anita Shankar, Chief, ASTU Eco Pvt Ltd
2. Ms. Sonal Shukla, Chief, Eco Conscious
3. Mr. Pranav Desai, Chief, Reco Solutions
4. Rumi Walia, Manager Youth Initiative, EDN
5. Ms. Neha Shivaji Naikwade, Chief, Climate Collective
6. Sumit Sharma, Programme Officer, UNEP India
7. Kaushik Chandreshekar, UNEP Expert

Theme: Intergenerational Dialogue on Re-imagining Education for a Climate Resilient Future

September 20, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Jacaranda 1

Background

Climate change is one of the most significant challenges of our times. Extreme weather events are now the new normal, increasing in scale, scope and frequency and affecting ecosystems, individuals, communities and economies. Since climate risks adversely impact diverse entities an effective and optimal response from various stakeholders embodying diverse roles and experiences is critical to develop a climate-resilient future.

Youth, who hold innovative ideas and are the decision makers of tomorrow, will bear a larger brunt of the impacts of a warmer world. The older generations on the other hand have knowledge on historical contexts and lessons besides holding the power to shape development trajectories in the present. As stakeholders, both can leverage their strengths and deliver meaningful change when working collaboratively. As such, an intergenerational dialogue between different age groups that enables the articulation of perspectives for navigating climate uncertainties and charting course for climate action would benefit the current climate discourse.

The education sector is an important stakeholder in addressing climate change for its potential role in fostering environmental stewards - who understand the gravity of climate change, are equipped with the necessary knowledge and skills and furthermore are inspired to take action. However, despite making major strides in the past few years, there are currently several challenges in integrating learning and skill building on climate resilience in school, youth and community programs- in ways that create meaningful and lasting impacts.

The education system today needs to adjust to a rapidly transforming, digitally advancing, sociologically complex, ecologically fragile, uncertain and turbulent world and its societal implications. As the sector acknowledges new climate realities, academic institutions must on one hand transform into environmentally friendly, climate smart hubs and on the other create an ecosystem that nurtures climate leaders and prepares them for future needs, risks, opportunities and actions to cultivate climate resilience. Re-imagining the education system – from policy and planning; curriculum and teaching; capacity building; research, data collection; school infrastructure and governance; community engagement; inclusivity and equity and more – would be critical to enabling and deliver a future that is resilient to climate uncertainties.

To address this complex challenge, an intergenerational dialogue that taps into the collective opinions, knowledge and experiences of both young and older stakeholders, could be an effective approach to re-visit what needs to change and how. Whereas the older age groups bring with them experience, expertise and wisdom, youth contribute fresh perspectives, novel ideas and enthusiasm for problem solving. The exchange and cross-fertilization of viewpoints towards shared climate responsibility would facilitate mutual learning, emergence of valuable insights

and innovative approaches and solutions to building climate resilience.

About the Session

The panel session on “Intergenerational Dialogue for Re-Imagining Education for a Climate-Resilient Future” will be a dynamic and interactive event held as part of the ICSE 2023. This panel session will bring together diverse stakeholders, including students/youth representatives, educators, policymakers, community leaders, representing different age groups to discuss and debate the role of the present education system in cultivating climate resilience - the strengths, gaps, opportunities and risks.

Using a national lens, they will put forward their opinion on the ways our education system needs to move ahead at this critical junction – of rapid ecological degradation, increasing greenhouse emissions, extreme climate events, the adverse fallouts to ecosystems, communities and nations – to make a positive contribution locally and globally. This will include locating and learning from local, regional and international approaches, tools and best practices. They will also deliberate on the ways the education sector can build on climate literacy to empower students and institutions so that they engage with real world problems and develop solutions.

Additionally, the panel will focus on how an intergenerational/multistakeholder approach can enhance the effectiveness of such an undertaking as is the rethinking of the education sector to build climate resilience. As such they will reflect on their potential roles and of various other stakeholders within the education sector to achieve lower ecological footprints, foster sustainable lifestyles and improve environmental conservation. Particularly the panel will provide a platform for the voices of students and youth leaders who are the decision makers of the future.

Session Objectives

The objectives of this intergenerational panel discussion are:

- To facilitate an inclusive, empathetic and efficacious dialogue between stakeholders of different age groups on the role of the education sector in shaping a sustainable and climate resilient future.
- To constructively deliberate on the abilities of the current education system to address climate change issues effectively and the future avenues available in order to advance the contribution of the sector to building climate resilience.
- To identify and examine strategies and best practices across local, national and global platforms across stakeholder



domains that can help enhance the role of academic institutions to nurture climate leaders and enable knowledge solutions and action for a more sustainable world.

- To provide opportunity for young people, students and youth to share their perspectives and ideas thereby recognizing their agency in contributing to climate adaptation and mitigation.

Outcomes

The panel session on “Intergenerational Dialogue for Re-Imagining Education for a Climate- Resilient Future” will harness the collective wisdom of diverse stakeholders across multiple age groups to explore the role of the education in catalysing climate resilience. The intergenerational approach to dialogue will allow for a democratic and holistic background that reiterates that every generation has a role to play in shaping a better world, and that collaboration is key to achieving that vision.

The specific anticipated outcomes from the session are as follows:

- Attendees will leave the session with an enhanced understanding of the ways in which the education system and its stakeholders will need to build on its strengths, address challenges and enhance capacities to create climate resilient futures. They might also be inspired to take proactive steps in their respective roles and spheres of influence.
- A list of actionable strategies for promoting effective climate literacy, climate engagement and climate action in the education sector will be compiled and documented.
- The panellists’ insights, ideas and discussions will be developed to formulate a report with recommendations that can be circulated to policymakers, academic institutions and other stakeholders to enhance their efforts to shape a climate resilient world. By considering perspectives from multiple age groups, recommendations are more likely to be inclusive, robust and comprehensive.
- The session will facilitate networking opportunities between attendees, fostering potential mentorships, partnerships and collaborations to strengthen climate education initiatives.
- The session is an opportunity to empower youth to be climate ambassadors and active participants in the related decision-making processes. It encourages them to take ownership of their future and contribute meaningfully to society.

Programme Schedule

1. Session Moderator : Dr. Shilpanjali Deshpande Sarma, Program Manager, Swechha: We For Change Foundation, Malviya Nagar
2. Panellist : Ms. Khanak Gupta, Senior Secondary student, The Shriram Millennium School, Faridabad
3. Panellist : Ms. Saloni Kumari, Senior Secondary student, Government Co-ed Senior Secondary School, Munirka
4. Panellist : Mr. Samarrth Khanna, Masters’ student, Teri School of Advanced Studies, Vasant Kunj
5. Panellist : Mr. Vimlendu Jha, Executive Director, Swechha: We For Change Foundation, Malviya Nagar
6. Presenter & Panellist : Mr. Richard McDonald, Executive Director, R Futures Group, Switzerland
7. Panellist : Ms. Susan Thomas, Educator and Consultant, Climate Reality Project, New Delhi (via Zoom)

Theme: Role of Sustainability Education in Amplifying Nature based Solutions for Climate Action

September 20, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Jacaranda 2

Background

Nature can provide solutions to many of the challenges society faces today, including climate change, food and water security, human health, disaster risk reduction, ecosystem degradation and biodiversity loss, and resilient and sustainable rural livelihoods. To accommodate the broad range, IUCN has defined Nature-based Solutions as “actions to protect, sustainably manage and restore natural or modified ecosystems, that address societal challenges (e.g. climate change, food and water security or natural disasters) effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.”

Nature-based Solutions (NbS) have the capacity to offer pathways for transformative changes to address the current crises and also to rethink the conservation-economy dilemma. Additionally, they create job opportunities and protect communities in vulnerable situations from disasters like flooding, landslides, and droughts.

Research shows that these could deliver up to a third of the emissions reductions between now and 2030 needed to limit global warming to 2C. It is estimated that \$44 trillion of economic value generation is moderately or highly dependent on nature and its services, which corresponds to over half of traditional global GDP (WEF, 2020). Approximately 1.2 billion jobs in sectors such as farming, fisheries, forestry and tourism rely on healthy and functioning ecosystems (WWF-ILO, 2020).

In this context, nature-based solutions (NbS) have gained significant attention as a holistic approach towards addressing these climate-related challenges. However, there is a critical gap in robust awareness, skill and knowledge among the young generation that needs to be bridged to fully capitalize on these opportunities. Sustainability education holds the key to filling this gap. It can empower the youth with the knowledge, values, and skills needed to drive NbS and take up green jobs. However, to scale up and mainstream NbS initiatives, robust awareness and understanding is required. This session seeks to explore this connection more deeply.

About the Session

This conference session aims to delve into the intersection of sustainability education, nature-based solutions, and green job creation for the youth, offering a platform for cross-sectoral dialogue and innovative idea exchange.

Session Objectives

The objective of this session is to explore and examine the role of sustainability education in amplifying the impact of nature-based solutions for climate action, and open up pathways to green jobs for the younger generation. It will provide a platform for academics, industry experts and environmental professionals

to share insights, experiences, and innovative approaches to integrating sustainability education and NbS.

Key Topics:

- Case studies of effective implementation of nature-based solutions.
- Opportunities and challenges in scaling up NbS initiatives with focus on green jobs opportunities for youth.
- Strategies for mainstreaming NbS and green jobs training within sustainability education at various levels.
- The role of public and private sectors in promoting green job opportunities in nature-based solutions.

Outcomes

- Highlight the integral role of sustainability education in promoting understanding and adoption of nature-based solutions.
- Facilitate knowledge exchange and cooperation among stakeholders involved in nature based solutions and climate action.
- Generate actionable recommendations for policymakers, educators, and practitioners to advance NbS.
- Active dialog on promoting green jobs within the realm of nature-based solutions.

Target Audience

The session is designed for educators, researchers, policymakers, students, environmental professionals, and all those interested in sustainability education and nature-based solutions for climate action.

Format:

The session will include keynote presentations by leading experts, panel discussion, and Q&A sessions to ensure a productive and engaging exchange of ideas.

Key Speakers/Panelists:

1. Moderator: Ms. Sheetal Antil, Sourcing Specialist, NbS, South Asia, South Pole
2. Mr. Arvind Anil Boaz, Climate Consultant, DFID-CCIP-ACT
3. Dr. Erach Bharucha, Director BVIEER
4. Ms. Archana Chatterjee, Program Manager, IUCN-India

Theme: Green Entrepreneurship & its Potential in the New World

September 20, 2023 | Time: 14:00-15:30 hrs (GMT +5:30) | India Habitat Centre, Magnolia

Background

Climate change is one of the greatest threats to human civilization. But in every crisis lies an opportunity. This is our chance to promote Green Entrepreneurship, especially among children and the youth, to face the climate crisis head-on. It's time to change our business-as-usual approach and find innovative ways to live sustainably. The emergence of green entrepreneurs will help propel this vision ahead. But how can we build the next generation of business leaders who prioritize environmental sustainability? What should we focus on?

Session Objectives

- Understanding the intersection of business innovation and environmental sustainability.
- How green entrepreneurs integrate environmental values into their businesses.
- Exploring various successful green businesses.
- The need for Mentorship programs across all levels and in every region for youth to opt for green entrepreneurship, and think "green".
- In what areas should mentors focus their efforts? What is the role of networking events, accelerators, and incubators in fostering the green entrepreneurship ecosystem?
- Discussing the potential for job creation and economic growth through green entrepreneurship.
- The emerging opportunities include technology and innovation as new avenues in the green space.
- What are the challenges faced by green entrepreneurs, be it funding, regulatory hurdles, or market adoption?
- Discussing the effectiveness of current government policies in promoting green entrepreneurship. What changes/if any are required to make them more robust and scalable?

'In the midst of the climate crisis, lies a great opportunity. It's Green Entrepreneurship.'

Protecting nature also means opening up enormous opportunities for livelihoods. Businesses can thrive by adopting green practices. And innovations in nature can change the existing scenario. Children and youth can become the bedrock for such ideas and innovations. Inculcating green values and skills among them can lead to a sustainable future. With India's focus on being a green economy and commitment to becoming a net-zero emissions nation by 2070, green jobs will be the focus of economic growth

for the next few decades. A mass movement to ignite the spirit of green entrepreneurship is on the horizon and it's time to take bold steps toward transforming India into a green economy. Let's create and inspire young people to journey toward green entrepreneurship.

Expected Outcome

Predicting the future trajectory of green entrepreneurship and its potential contributions to sustainable development goals. A discussion on the successful examples that have created a measurable impact and brought transformative climate action among children and youth.

Key Speakers/Panelists:

1. Mr. Madan Padaki, Strategy Advisor to UNICEF India-Chair
2. Mr Amit Banka, Founder, WeNaturalists-Moderator
3. Ms. Perna Prasad, Founder & CEO, Ecoplore
4. Mr. Arunav Sharma, Founder & CEO, Rising Sun Energy Private Limited
5. Mr. Ajay Kumar, Co-Founder, Teach for Green

Abstracts of Contributed Papers and Posters

Abstract ID 3:

**BUILDING 21ST CENTURY
COMPETENCIES FOR
SUSTAINABILITY LEADERSHIP -
AN ACTION RESEARCH**

Dr Meenal Arora

**Senior Consultant, Ministry of Education,
Government of India**

meenalar18@gmail.com; +91-9868786136

The youth of today is growing up in an interdependent, complex and uncertain world, compelling everyone to redefine the landscape of education and work. Preparing learners for work, citizenship and life in the twenty-first century is daunting. Gender inequality and poor health, poverty and consumerism, natural disasters and food insecurity, amidst persistent disengagement among youth and high early dropout rates, call for our school education to become more relevant for our students. There is a general agreement, in order to engage constructively and responsibly with today's world, our students need to have certain key competencies. Education, thus, must respond to the new 2030 Agenda for Sustainable Development by preparing the new generations in dealing with these sustainability challenges.

What was designed for the industrial era of the 19th century, now fails to serve our children, our communities and, our planet in the 21st century. The current global challenges have local repercussions, e.g. climate change is affecting lives all across the globe in different ways. Simultaneously, local efforts have global consequences, e.g. reducing individual carbon footprint can improve the health of children experiencing respiratory issues in another part of the country. In this light, the sustainability leadership programme was designed to stimulate the much-needed competencies empowering learners to contribute towards achieving an ambitious and crucial global agenda of sustainable development. Education is not only an integral part of sustainable development but also a key enabler for it. It is not only a goal but also a means for achieving an end. This research has been primarily conducted to respond to this pressing need by defining relevant learning objectives, broken down into specific knowledge, skills, and attitudes and values, introducing pedagogies that empower learners, and urging schools to include sustainability issues in their day to day activities. The research has demonstrated the promise and potential of sustainability education to restore vibrant, engaged learning within our schools, by organizing holistic, participative, open-ended, reflection-based activities related to gender, cultural diversity, health and hygiene, biodiversity, disaster risk reduction, and others.

Action research was adopted to implement the activities of the sustainability leadership programme, wherein the researcher attempted to step beyond the factory model of schooling to a model that better serves children's learning needs, as well as local and global environmental, social, and economic needs. This action research is participatory and democratic research, which allows for socially responsive actions, meant specifically for a particular context.

The effectiveness of the programme in terms of competency building was evaluated using a self-developed matrix. The researcher prepared a comprehensive matrix breaking down each competency into clearly defined knowledge, skill and attitude and values. The results and findings of the study

were also drawn by conducting a focus group discussion with the participants and by seeking feedback from the teachers and principal of the school.

This research is intended to benefit school teachers and curriculum developers by being reflective practitioners when planning pedagogical approaches for 21st-century learners. The knowledge gained through action research can empower students, teachers, and managers and enhance learning, teaching, and policymaking.

Keywords: Sustainability Leadership, Competency Building, School Education

Abstract ID 4:

**JUTE AS A GAME-CHANGER PLANT FOR
CLIMATE MITIGATION AND
SUSTAINABLE PRODUCTS: STUDENTS'
PERCEPTION IN SECONDARY SCHOOL OF
BANGLADESH**

Md. Rishad Abdullah, PhD

**Senior Scientific Officer, Bangladesh Jute Research Institute,
Regional Office, Rangpur, Bangladesh**

rishad.abdullah@gmail.com, +8801712894181

Jute is a natural fiber used for centuries in various products, from burlap sacks to twine. In recent years, jute has gained attention as a potential game-changer plant for climate mitigation and sustainable products. Jute is a carbon-negative crop that absorbs more carbon dioxide from the atmosphere than it releases during growth and processing. Jute is also a renewable resource that can be grown and harvested repeatedly without depleting the soil. In Bangladesh, jute is a major crop and a significant source of employment. However, secondary school students in Bangladesh lack awareness about the potential of jute for climate mitigation and sustainable products. Considering the above context, the survey was conducted from January to May 2023 in 25 secondary schools in Rangpur district of Bangladesh. Through a semi-structured questionnaire, 1,000 secondary school students in Bangladesh assess their knowledge and perception of jute. The survey results showed that 80% of students were aware of jute as a natural fiber but not of its potential for climate mitigation and sustainable products. 15% of the students (students from urban schools) indicate that Jute products are the only alternative to beating plastic pollution. 90% of the students from rural schools mentioned that they use different jute products in their daily life, but most of the students from urban schools hardly can find jute products in their daily life. The study also found that students were more likely to be aware of jute's potential for climate mitigation if they had taken a science class that had covered the topic of climate change (60 % of students from urban schools). The study concluded that there is a need to increase awareness among secondary school students in Bangladesh about the potential of jute for climate mitigation and sustainable products. This could be done by incorporating jute into science curricula and providing students with opportunities to learn about jute through hands-on activities. The study has implications for the future of jute in Bangladesh. If awareness about jute's potential for climate mitigation and sustainable products can be increased among secondary school students, then it is likely that demand for jute will increase. This could lead to

increased cultivation of jute, which would positively impact the environment and the economy of Bangladesh.

Keywords: jute, climate mitigation, sustainable products, secondary school students, Bangladesh

Abstract ID 5:

CROWD FOREST IN SCHOOL: A DREAM PROJECT IS IN PROGRESS

**Maruf Abid¹, Rifat Jahan², Sanjit Chandra Barman³
and Md. Rishad Abdullah⁴**

1 Managing Director, Plant Conservation and Research Foundation, Mymensingh, Bangladesh
marufabid.dca@gmail.com

2 Head of Education, Plant Conservation and Research Foundation, Mymensingh, Bangladesh
rjbd78@gmail.com

3 Plant Curation Manager, Plant Conservation and Research Foundation, Mymensingh, Bangladesh
sanjit232@yahoo.com

4 Senior Scientific Officer, Bangladesh Jute Research Institute, Regional Station, Rangpur, Bangladesh
rishad.abdullah@gmail.com

To connect text to nature, a plant conservation initiation was held in August 2021 at Jahir Uddin high school in Sadar Upazila, Mymensingh district, Bangladesh, supported and aided through the assistance of the SUSI Educators: Small Grants program. The initiative's main purpose was to create a small-scale forest in the schoolyard with native endangered plant species with medicinal properties. When compared to traditional plantation procedures, the forest known as Miyawaki forest (also known as crowd forest) has a distinctive feature: nearly 30 times more trees are planted. Plant growth is 10 times faster, resulting in 30 times denser plantation; guaranteed annual tree height increase of at least 1 meter; and, after the first three years, a completely maintenance-free, untamed, and native forest. A plant conservation club was founded with 30 pupils led by a teacher to perform activities. Over 56 varieties of rare species with therapeutic properties were initially planted by members of the plant conservation club. Soon, 100 types of endangered indigenous medicinal plants will be collected and planted. The project activities facilitate student engagement by establishing real-world linkages through nature. Critical thinking and problem-solving abilities, as well as communication and teamwork, were dramatically increased due to the process. Most secondary schools in the Mymensingh educational region planted fast-growing foreign species such as acacia, eucalyptus, and mahogany in response to market demand. These trees serve no purpose in nature other than to provide wood. Students visited various government nurseries searching for local medicinal plant saplings as part of activities. They are overjoyed to gather data and learn more about native plants from the Horticulture Centre. They also made a day-long visit to BAU botanical garden and Madhupur National Park to collect saplings of native plants. Each student is committed to building their school like a living museum. At the conclusion of the project, the crowd forests within the school will serve as a plant conservatory for endangered indigenous Bangladeshi species with therapeutic properties. It is worth noting that this is the first institutional-level afforestation program of its kind, particularly at the secondary school institution level in Bangladesh.

Keywords: Native plants, Students, School and Medicinal plants

Abstract ID-6:

NURTURE THE NATURE INDICATORS OF THE PLANET EARTH

Rajan Kumar Singh

Financial Controller / Researcher – Orbitx Aerospace India Pvt Ltd, Finance & Accounts, Radisson Hotel Group, New Delhi, India
rajansingh5264@gmail.com

It's a user-friendly portal/gateway which is bundled with multi Earth observations in which the visualizations are categorized in form of Earth Indicators, Natural Hazards, Environmental Threats, Ecosystem Health and Monitoring Climate. This web app is loaded with 18 Earth Indicators, 18 Geo Maps, 12 Earth Engine Apps, 18 Infographic Data Analysis in Tableau followed by 09 Quizzes based on various climate change factors. This app provides an opportunity to explore multi EO at one place resulting into focused study and creates awareness as well. Severe climate is leading to unavoidable disasters in future hence it's must to understand and call for actions towards saving the planet. The main objective of this study is to develop a capacity building resource that would help the citizens to understand the current facts/forecast of climate change & its impacts.

Keywords – Earth Observations; Multi Mission EO; Climate Indicators; Natural Hazards; Disaster; Capacity Building.

Abstract ID 7:

SEAWEED EXTRACTS AS A SUSTAINABLE SOLUTION: ENHANCING LIQUID FERTILIZER FOR IMPROVED GERMINATION & GROWTH OF *Capsicum annuum* & *Solanum melogena*

Sagar Chawan¹, Arvind Kumar¹, Sanofar Khokher²

1. Department of Biochemistry, School of Bioengineering and Biosciences, Lovely Professional University, Punjab 144401
2. Department of Zoology, School of Bioengineering and Biosciences, Lovely Professional University, Punjab 144401

In contrast to synthetic fertilizer, the goal of this study was to investigate the potential of liquid fertilizer made from seaweed extracts to promote sustainable environmental practices. The main goal was to determine how seed priming with different seaweed extract concentrations influenced the germination rates and growth characteristics of *Capsicum annuum* and *Solanum melogena*. *Ulva reticulata*, *Cystoseria indica*, *Botrycladia leptopoda*, *Halimeda tuna*, and *Iyengeria stellata* were five of the seaweed extracts used for seed priming.

According to the findings, seed priming with a liquid fertilizer made from seaweed extracts significantly improved the germination rates and growth metrics of *Capsicum annuum* and *Solanum melogena*. For *Capsicum annuum*, the greatest germination rate of 100% was noted for all seaweed extracts. The germination rates for *Solanum melogena* varied from 80% to 96.6% based on the particular seaweed extract employed.

Additionally, the variation in *Capsicum annuum* seedling

length, which ranged from 7.37 0.03 to 9.34 0.03, suggested the possibility of enhancing growth by using various seaweed extracts. Particularly noteworthy were the greatest values for the seed vigour index (SVI), seed stamina index (SSI), shoot length (SL), and root length (RL) in seeds treated with a 4% concentration of *Ulva reticulata*. While *Solanum melogena* was treated with a 10% concentration of *Halimeda tuna* extract, the growth parameters were found to be particularly positive.

The findings demonstrate the promising ability of liquid fertilizer derived from seaweed extracts, particularly *Ulva reticulata* and *Halimeda tuna*, to promote germination and growth. Liquid fertilizer can be used in place of synthetic fertilizer to support sustainable environmental practices, and improve ecosystems overall. A natural and environmentally friendly alternative that may reduce reliance on synthetic fertilizers and reduce many environmental problems connected with their use is liquid fertilizer made from seaweed extracts.

As a sustainable alternative to synthetic fertilizer, this study highlights the advantages of liquid fertilizer derived from seaweed extracts. The germination and growth of *Capsicum annum* and *Solanum melogena* can be greatly enhanced by optimizing the concentrations of *Ulva reticulata* and *Halimeda tuna* extracts. Such eco-friendly agricultural methods have the potential to increase environmental sustainability and lessen the carbon footprint of the farming process.

Keywords: Seed priming, germination rate, seed vigor index.

Abstract ID-8:

ASSESSING THE HEALTH OF BIODIVERSITY USING CITY BIODIVERSITY INDEX IN FAST EXPANDING URBAN SPRAWL: LESSONS FROM FARIDABAD, INDIA

Chandan Das, PhD Environmental Sciences, SES, JNU
Jayshree Shukla, CSIR-NEERI, **Shalini Dhyani**,
 Principal Scientist, CSIR-NEERI
 chandandas9873@gmail.com

Urbanization is increasing rapidly in developing countries with simultaneous increase in the temperature due to urban heat island effect and population explosion which is significantly affecting the urban green spaces and biodiversity. Since, urban expansion is putting a heavy toll on biodiversity health, a comprehensive biodiversity assessment is required to capture the growth trajectory towards sustainability. The City Biodiversity Index (CBI) has emerged as a relevant tool to assess the biodiversity conservation efforts of the citizens of a city. Present study was undertaken to evaluate the City Biodiversity Index for Faridabad city, a rapidly expanding smart city close to metropolitan of Delhi, capital of India. Complete assessment of all the 23 indicators were carried out using a mixed method approach that includes RS-GIS tools, review of available secondary information, participatory surveys with the local stakeholders, field based primary data collection and focused group discussion with different government organizations. The city scored 64 out of total 92 credits for the CBI. More than half of the world's population is residing in the cities putting stress on the demand-supply gap, it becomes vital to calculate CBI for other global cities from around the world to measure the progress of biodiversity conservation every two to three years. The lacunae observed can be used to fix it by considering Nature based solutions

(Nbs) approach and disaster risk-reduction strategies in city's quality urban planning.

Abstract ID-9:

MANGROVE AQUASILVICULTURE FOR CLIMATE RESILIENT AND INTEGRATED COMMUNITY DEVELOPMENT

Neetu Arya*1, Nimai Das²

1. Ph.D. scholar, Indian Institute of Forest management, Bhopal- 462003

2. Associate Professor, Indian Institute of Forest Management
 *Correspondent author: - naryafri21@iifmbhopal.edu.in

Mangroves are regarded as one of the most dominating sources of livelihood as well as ecological assemblages of plant communities that serve as a transition zone between land and sea. It dominates three-quarters of the world's tropical, subtropical coastlines and intertidal regions, covering roughly 0.1 percent of planet's surface, but they store up to 10 times more carbon per hectare than terrestrial forest and also contribute 10-30 percent in economical level (Ghosh and Mondal, 2016; Aburto-Oropeza et al., 2008; Ronnback, 1999). The mangrove ecosystems fulfil a wide range of ecosystem services including provisioning, regulatory, supporting, cultural etc.

Globally mangrove forest faced a many risks including harvesting of timber, increase sea level rise, change in rainfall, temperature because of human interventions and natural calamities. The loss of mangroves is very crucial concern, because they provide many services and benefits to environment and people. Keeping these facts in mind, aqua-silviculture is the best sustainable practice for the conservation and restoration of mangrove forests, so we need to apply it more widely. East asian nations such as Vietnam, Philippines, China, and Indonesia use this strategy to conserve mangroves, which helps to gain economic and environmental benefits as mangrove cover increases.

The current study focuses to encompassing the aqua-silviculture approach, which seems to be highly effective, climate-adapted, and environment friendly practice, that allows for the development of fish and perennial plants (especially trees). Scholarly literature mentioned, mangroves are dwindling due to anthropogenic overexploitation and unprecedented climate variability. The proposed study focus on the management approach which will illuminate the appropriate mangrove coastal sites where this approach can be beneficial and protected from natural calamities, and also to identify the economic remittance of mangrove ecosystem services from the aqua-silviculture. This strategy is based on the concept of reforesting the disappeared mangrove forests, which enables fishermen to be employed and supported during prohibited seasons, as well as preventing soil erosion and sea pollution.

Methods: This study is based on a secondary data sources government reports and international reports from the IPCC, NRSC, FAO, MEA, and IMD etc. This information will help to determine the scope of aqua-silviculture in India's coastal areas, as well as the suitability of establishing, implementing this system and will also support in community-based adaptation measures during hazard and disaster events in India.

Expected result: The main focus in this idea is to reforesting the disappeared mangrove forests Providing additional employment to local fisher folks/tribals and also support fishermen during banned seasons.

Conclusion: Changes is unavoidable, so we must concentrate our efforts and attention on the current situation, in which mangrove forests are being mismanaged in an unsustainable manner (Leonard, 1987). As a result, aquasilviculture is one of the best social innovations among India's climate-vulnerable but forest-dependent coastal communities. The study's findings will be critical in assisting policymakers in taking additional steps to develop a climate-resilient society in India.

Keywords: Mangrove, Aqua-silviculture, Ecosystem services, Climate change, Sustainable

Abstract ID-10:

ROLE OF EDUCATION AND KNOWLEDGE OF INDIGENOUS PEOPLE IN CLIMATE CHANGE ADAPTATION

Rakhi Tyagi¹ and Archana Chaudhary²

1 Research Scholar, Department of Environmental Science, SGT University, Gurugram. E-mail: tyagirakhio@gmail.com

2 Associate Professor, Department of Environmental Science, SGT University, Gurugram.

E-mail: archanac_fosc@sgtuniversity.org

Adapting to climate change is a significant social task, made more challenging by questions of climate justice and the uncertainty of future effects. Climate change become the serious issue which is increasing on daily basis. The future of humanity on our planet is gravely threatened by the 1.50 C rise in global temperature. The underlying causes of it are both human and natural activities. The world is in danger as a result of its worrying effects. To overcome the problems caused by climate change, education and knowledge of indigenous people is essential. It facilitates understanding of the effects of global warming, raises people's awareness of climate change, and supports a shift in attitudes and behavior as well as adoption of trends relevant to climate change. Technology of awareness will guide Earth's population towards a peaceful and sustainable way of existence. Indigenous peoples' knowledge systems and cultural practices are acknowledged as a "major resource" for coping with climate change. Because they directly rely on their immediate environment to satiate their basic needs for survival, Indigenous Peoples and local communities (IPLC) are impacted by global environmental change. As a result, it is essential to protect and rebuild ecological resilience in order to maintain their wellbeing.

Additionally, education helps people make decisions, solve problems, resolve disagreements, and cultivate a culture of peace. It is essential for community adaptation and mitigation to climate change, and it helps people live more sustainably. The growth of material life causes disorder in the family, society, country, and world by eroding values, raising unconsciousness. Awakening of consciousness is hardly necessary to save the lovely, dear Earth from all of her misfortunes. Education will equip people and economies with the information and skills they need to shape green environments, low GHG emission societies, and climate-resilient societies in order to address the problems of

climate change. Along with our cooperation on a global, regional, and national level, key organizations like UNESCO, the World Bank, UNDP, UNFCCC, WCPA, and others are taking significant action. A holistic and humanistic view of the world, social and economic progress, the eradication of poverty, the promotion of peace, and sustainable living may all be found in high-quality education.

Keywords: Education, indigenous knowledge climate change, GHGs, Global warming, Environmental sustainability.

Abstract ID-11:

RIVERS AND THEIR EVOLVING RELATIONSHIPS WITH SOCIETY

Sneha Shahi, PhD Scholar, ATREE – Bangalore
sneha123shahi@gmail.com

Rivers are a connecting ecosystem for biodiversity, society and the cultural transitions undergone over a period of time. Constitutive relationships between humans and rivers can be critically important to assessment and implementation of environmental flows. Notions of healthy rivers reflect thriving biodiversity, societal values, perceptions and aesthetics. Different forms of co-evolution of societal development and rivers took place in different areas over different time frames - as rivers have played different roles at different stages of human history. Relationships of a river might lead to fluctuations in the river's health, and these transitions could be attributed to changes in economic structure or culture, value of a community and nature of use of the river. To understand how the river reached the current state in the present day it is essential to carve out the historical narrative and past perceptions of the community towards the river ecosystem. Unless the causes for the current state are understood, planning and management can never be effective or sustainable in the long run.

Different forms of co-evolution of societal development and river have been studied over multiple time frames, as rivers have played a key role at different stages of human history and establishment of civilizations. The establishment of civilizations along the river for sustenance and utilizing water resources for agriculture, households and transportation. The ancient civilizations like Indus, cities from Mauryan empire and so on have proven how access to resources has aided in shaping technological and agricultural strengths of a civilization. The study will engage in understanding the changes of one most revered Rivers of South Indian River of Tamiraparani through a social-ecological framework I investigate the shifts in dependence on river systems over time (3 decades) to unravel the water-society interactions, highlighting stories of change to trace the past and current stressors and responses of the river system. The work will shed light on how we can deploy science based environmental education for river conservation and nudging policies for freshwater protection.

Abstract ID-12:

EDUCATION OF THE ENVIRONMENT, WITHIN THE ENVIRONMENT FOR A SUSTAINABLE FUTURE

Praneetha M, Oxford Brookes University

Mr. Manu K, Founder, Hasiru Hejje, A Green-school initiative, Email: praneethamonipi9@gmail.com

Children are our future. The planet's future. Long after we become part of the dust, the next generations are going to be stewards of the environment. Keeping this in mind, today, it is crucial to reconnect children back to nature and all its wonders of life. Following on this idea, I have been part of a combined vision to open the doors of Nature to children of all ages and backgrounds. Each year, small groups of children are taken to the Western Ghats for a Conservation Awareness and Environment Sustainability camp where they acclimate and marvel in the world of rainforests. The doors of Nature and conservation are opened to young minds via natural history documentaries, species observation and knowledge, spending time within riparian and Shola forests among other habitats, discussions and conversations, lessons of balance, behaviour and sustainability interwoven in engaging games, and witnessing first-hand the impacts of exploitative development. We have witnessed children who come in with no connection to the environment, never having touched the soil or by the rain, specially-abled, gifted, uninterested in Science or even just observing the environment around them, transform into self-reliant, co-habiting, empathetic, environmentally keen individuals by the end of their time inside the rainforest world. Green-school programs involving kitchen gardens on education campus, especially in rural areas has also resulted in developing an income, and preservation of native species in organic methods via learning about the soil and species.

What seems like a different bubble initially, ends up integrating them and they take away crucial lessons in co-existence, sustainability, waste management, observation, silence, compassion, co-habitation, and conservation awareness. Several children have been so deeply impacted that they have also pursued science, environment, and conservation studies full-time, pursuing a future in environmental sustainability both in their careers and in their lives. This soft approach in a fast-growing world of reconnecting children, especially at such a young age, back to nature has proven to be an extremely important and strongly founded step in ensuring that they can continue to do right by the environment, by themselves, their generation and their future generations in the hope of a continuing stable and sustainable planet.

Abstract ID-13:

CATASTROPHIC CHANGES IN CORAL REEF DYNAMICS UNDER MACROALGAL TOXICITY AND RISING SEA SURFACE TEMPERATURE

Samares Pal, Department of Mathematics, University of Kalyani, Kalyani 741235, India.
Email: samaresp@yahoo.co.in

Coral reef ecosystems are most vulnerable to changes in sea surface temperature (SST), a key environmental factor critical to reef-building growth. Elevated SST reduces the ability of corals to produce their calcium carbonate skeletons. Prolonged high SST results in coral bleaching owing to the uncoupling of symbiosis among corals and microalgae. Corals have narrow temperature tolerances. The skeletal growth rate of corals falls sharply to zero even at a slight increase of SST above its temperature tolerance level. Corals are also vulnerable to macroalgal toxicity. Several benthic

macroalgae species are known to bring about allelopathic chemical compounds that are very harmful to corals. The toxic-macroalgae produce allelochemicals for which the survivability and settlement of coral larvae are highly affected. Toxic macroalgae species damage coral tissues when in contact by transferring hydrophobic allelochemicals present on macroalgal surfaces, leading to a reduction of corals and even coral mortality. The abundance of toxic macroalgae changes the community structure towards a macroalgae-dominated reef ecosystem. We use a continuous time model to investigate coral-macroalgal phase shifts in the presence of elevated SST and macroalgal toxicity. We have derived the conditions for locally asymptotic stability of steady states. Computer simulations have been carried out to illustrate different analytical results.

Abstract ID-14:

HARNESSING SEED SCIENCE AND TECHNOLOGY FOR CLIMATE-RESILIENT TROPICAL FOREST CONSERVATION

Manish Kumar Vijay

Scientist-B, ICFRE-Tropical Forest Research Institute, Jabalpur-482001, Madhya Pradesh, India
Email: manishvijay89@gmail.com/vijaym@icfre.org,
Mobile No. 7240259907

Tropical forests, which are renowned for their great biodiversity, now confront unprecedented problems as a result of climate change. Numerous plant species and the ecosystems they sustain are seriously threatened by the swift changes in temperature, precipitation patterns, and extreme weather events. Ex-situ conservation initiatives have thus become more and more important for preserving the diversity of tropical forests. However, they face numerous challenges in seed conservation, which have implications for their long-term survival. This paper highlights the key problems encountered in tropical forest seed conservation. These challenges include limited knowledge about seed biology and storage requirements of diverse tropical tree species, difficulties in collecting and processing high-quality seeds, inadequate infrastructure and resources for seed storage facilities, and the impacts of climate change on seed viability and germination. Additionally, issues related to seed dormancy, desiccation sensitivity, and recalcitrant seed behavior further complicate seed conservation efforts. Addressing these challenges is crucial to ensure the effective preservation and sustainable utilization of tropical forest genetic resources. This paper emphasizes the importance of research, technological advancements, and collaborative efforts in developing appropriate seed conservation strategies for tropical forests, which will contribute to their resilience in the face of ongoing environmental changes and support their conservation and restoration efforts. One ongoing significant project highlighted is the All India Coordinated Research Project on Seed Technology, funded by CAMPA (MoEF&CC) at the ICFRE-Tropical Forest Research Institute in Jabalpur, Madhya Pradesh which aims to harness and advance seed processing, handling, viability, storage physiology, and the development of seed storage protocols and nursery techniques for fourteen tree species. By improving these aspects, the project seeks to enhance the resilience of forestry species in the face of climate change impacts. The research outcomes and technological advancements derived from this project so far have broader implications for climate change adaptation and mitigation efforts, as they contribute

to the sustainable management of forest ecosystems, the conservation of biodiversity, and the promotion of ecological restoration practices. Ultimately, the harnessing of seed science and technology provides a promising avenue for climate-resilient tropical forest conservation. By preserving the genetic diversity of tree species and promoting their adaptation to changing environmental conditions, ex-situ conservation efforts contribute to the long-term survival and ecological integrity of tropical forests in the face of climate change.

Keywords: Conservation, Viability, Maturation, Climate change, Biodiversity

Abstract ID-17:

I AM CHEETAH ! & EFFECT OF CLIMATE CHANGE ON MY POPULATION

Dr. Pradnya Giradkar, Ms. Sujata Golhar

Email: pradnyatadoba@gmail.com

Wildlife Conservation & Rural Development Society, Umred, Dist-Nagpur (MS)

Cheetah (*Acinonyx jubatus*) is only carnivore that extirpated mainly by over hunting and loss of habitat in India in historical period. To restore lost heritage; Cheetah re-introduced in India from Namibia in Kuno National Park, Madhya Pradesh on September 2022 for ethical as well as ecological reasons. The Cheetah is a unique animal and which plays a pivotal role in the health and diversity of grassland ecosystem. To conserve cheetah in sustainable way; there is need to aware people about ecological importance of Cheetah.

Wildlife Conservation & Rural Development Society's project aims to preserve the nation's Cheetah population through sustainable education, scientific research, outreach with farmers, community development, train local leader for future conservation, and raising awareness among rural students, teachers and general public through advocacy and leadership at national level to empower people of rural areas to mitigate and prevent cheetah-human conflict and to promote coexistence with Cheetah.

This poster illustrates figures & information on cheetah i.e. body structure, behavior, IUCN status, ecological importance and effect of climate change on cheetah population so that people create and raise their interest to conserve this species in sustainable way and act together to solve climate crisis to save the Cheetah and future generation which plays vital role for maintaining a proper balance of ecosystem.

Keywords: Cheetah, Conservation, climate change, education, awareness.

Abstract ID-18:

UNDERSTANDING THE SCOPE OF VARIATION IN TREE CANOPIES IN IMPROVING THE SOIL ORGANIC CARBON IN THE ARAVALLI FOREST IN DELHI

Neelima Raghuvanshi^{1,2}, Ambuj Mishra¹, Satish Chandra Garkoti¹

¹School of Environmental Sciences, Jawaharlal Nehru

University, New Delhi

²Indian Institute of Science Education and Research (IISER), Kolkata

Email: neelimaraghuvanshi26@gmail.com

The study focuses on understanding the influence of varying canopy types, simple broad-leaved (SBL) *Cassia fistula* and the pinnately compound leaved (PCL) *Acacia nilotica* and *Prosopis juliflora*, on the soil physio-chemical and biological properties in the semi-arid region of Aravalli hills. Eight parameters were studied viz. soil pH, soil EC, litter deposition, soil moisture, Soil organic carbon (SOC), total nitrogen (TN), microbial biomass carbon (MBC) and nitrogen (MBN). We also measured the magnitude of the penetrated solar radiation in the selected varying canopies for varying times with lux-meter. Results indicated that the SBL species formed a denser canopy compared to PCL species, providing significantly lower penetration of solar radiation in the canopy. This, subsequently resulted in the higher soil moisture retention in SBL species than PCL Species. *C. fistula*, having a denser canopy, higher foliation contributed lower permeability for sunlight, more biomass to the soil, with higher leaf litter in the peak month of litter fall than *A. nilotica* and *P. juliflora*. The higher decomposition rate of biomass was favored by lower pH, higher soil moisture content and subsequently by higher EC in the *C. fistula* canopies than in the *A. nilotica* and *P. juliflora*. The higher litter biomass and higher soil moisture in the *C. fistula*, also contributed to higher magnitude of SOC and TN in the soil. Higher retention of soil moisture influenced the microbial activity in the rhizospheric soil which ultimately increased the decomposition rate in the SBL species, *C. fistula* (indicated by the high levels of MBN and MBC in the rhizospheric soil) thereby releasing more carbon and nitrogen from the litter into the soil. Therefore, higher percentage of SOC and TN was observed in the *C. fistula* than in the *A. nilotica* and *P. juliflora*. The lower solar permeability and higher canopy density, provided more favorable micro-climatic conditions, due to optimum temperature and moisture retained in the soil to enhance the decomposition rate of the litter fall. The study may provide beneficial clues to various stakeholders including forest managers for framing appropriate policies for improved conservation and restoration plans for semi-arid forests.

Keywords: Soil moisture, litter decomposition, canopy cover, microbial biomass, *Cassia fistula*

Abstract ID-19:

EDUCATING FOR CLIMATE ACTION, SUSTAINABILITY AND DISASTER RESILIENCE

Dr. Abdhesh Kumar Gangwar

Focal Point, RCE Srinagar

Email: abdhesh.gangwar@gmail.com, +91-9415104125

More than 65% India is rural engaged in agriculture and animal husbandry which are highly susceptible to climate change. Rapidly increasing extreme weather events and other climate induced disasters pose serious threats to livelihoods, food, nutrition, health, ecological and other securities. Disaster related losses, both lives and infrastructure, across India are quite high and further increasing. India is faced with high population density, illiteracy, poverty, malnutrition, poor sanitation, hygiene, high infant mortality, stunted growth of children, anaemia, high disease burden,

gender and economic inequality and a mosaic of several other problems. The country has significant vulnerable population. In India National Government is strong, also the State Governments. However, the tertiary level of governance, the Panchayati Raj Institutions (PRIs), having elected representatives, need significant capacity building. PRIs have an important stake in improving elementary education and the community action. These are the units of translating ideas into action. Development happening in Gram Panchayats (GPs) will make States and the Country developed. While working at the grassroots, collaboration with the government agencies is always required to get pilot projects mainstreamed.

RCE Srinagar has been engaged in educating students and teachers, training concerned government officials and empowering communities, governance system at grassroots, towards making India 'Climate Smart, Sustainable and Disaster Resilient'. RCEs (Regional Centres of Expertise on Education for Sustainable Development, acknowledged by the United Nations University, Japan) aspire to translate global objectives into the context of their local communities. Through Global and Asia-Pacific Regional events of the RCE community local knowledge, expertise, and best practices are shared globally through the network.

Schools are a good platform for educating youth and inculcating environment friendly attitudes. They also provide a window to reach out to community. The teachers and students being part of the local community prove a great asset in strengthening and empowering GPs. School teachers and students help GPs in integrating environmental sustainability, climate resilience and disaster risk reduction preparedness in their 'Gram Panchayat Development Plan' (GPD). With these initiatives community members are becoming the first responders during disasters. Hand Print, Foot Print, and their Calculators are being taught and demonstrated. People, individually and collectively, now have been trying to reduce their footprint and increase handprint. This has been promoting sustainable consumption and production and circular economy. This has been helping in cutting down 'Earth Overshoot' and increasing community's contribution towards achieving 'One-Planet Living'.

Schools and Gram Panchayats engaging in environmental conservation projects has been leading to efficient natural resource management, creating income and employment opportunities locally, stopping out migration and improving overall wellbeing of local population. Our efforts are in tune with global and national targets like Sustainable Development Goals (SDGs), Paris Climate Agreement, Lifestyle for Environment (LiFE). Our interventions are making schools as turn key agents in strengthening local community, the State and the Nation. India holding G20 Presidency this year proving an asset to it.

We are also engaged in capacity building of the Government officials, State and Central both. In Uttar Pradesh during 2018-2019, we took part with State Department of Rural Development, and Department of Panchayati Raj in training 426 officials as Master Trainers who in turn have trained 14,220 Lekhpals in Disaster Risk Reduction. The Lekhpals trained now cater to 223 million people distributed in 75 districts of UP. These modest efforts so far directly and indirectly have reached out to 2,43,014 schools and their 10,09,333 teachers and 2,58,06,929 students. For organizing trainings and capacity building events RCE

Srinagar ties up with concerned institutions like for teacher training with Department of Education, State Council of Educational Research and Training, Institute of Advanced Study in Education, Nehru Yuva Kendra Sangthan etc. Our Climate Change, Sustainability and DRR School Programmes have provided children and the community an opportunity to mitigate the impact of Disasters through education, awareness and capacity building. The main purpose of the programmes is to make schools safer, at the same time facilitating schools to become centres for community action, training and coordination on disaster risk reduction (DRR). These school programmes are committed to engaging children, teachers, parents, school management, local authorities and other key actors in disaster risk management. Both students and teachers find the programme very interesting and useful. Being 'DRR Prepared' students and teachers now feel more confident in handling any disaster situation and they will be able to help themselves, not become the victim, become the first responder to help others in need.

Besides DRR Preparedness, the joyful and interactive approach to education is being demonstrated in the schools. This approach promotes teaching and learning where learning is not just confined to classrooms, the classroom teaching and learning is linked to outside environment. Open air school model 'Umang' combines formal and non-formal learning with partly curriculum-based activities. The concept of 'Umang School' is based on the concept of 'School Without Wall'. Post disasters, the damaged schools well accommodate practicing Umang. It also helps in restoring school education and getting children out of trauma caused by the disaster.

Our projects 'Mustaidi' (Urdu word meaning readiness or alertness) and 'Mehfooz' (School Safety programme encompassing safety of all, everywhere, all the time) were conducted in Jammu and Kashmir for the children in schools and the larger village communities through extensive community-based disaster risk management approach orienting over 12,000 students, 200 teachers and 22,500 community people on 'Dealing with Disasters'. These initiatives ensure safety and wellbeing of all, everywhere, all the time and have improved quality of life and quality of environment helping achieve 'Green Earth, Blue Sky and a Disaster Resilient Community'.

Abstract ID-20:

THE URGENCY OF CLIMATE EDUCATION: ADDRESSING THE IMPACTS OF HEAT WAVES IN BANGLADESH

Md. Kaium Ahammed Molla

Research Officer, SESIP, DSHE, Ministry of Education.

Email: kaium6161@yahoo.com

Bangladesh faces a growing problem with heat waves (HW). HW is getting longer as time goes by. The youngest children are the hardest hit because their school attendance drops when they become sick more often. Based on the Global Climate Risk Index, Bangladesh is the seventh most at risk country globally. Because of this, educators and institutions of higher learning must devote greater resources to reshaping certain climate-related curriculum, beginning with serving as a role model on campus. A yearly conference on climate change should be organised by national educators, teachers,

students, stakeholders, and policy makers. The problem is recognised, its obstacles are posed, and a solution is developed. Education for sustainable climate development (ESCD) is a vision of education that equips students with the information, expertise, and values they need to become active participants in creating a more sustainable world. Consistent development of “proactive learning,” “interactive learning,” and “in-depth learning” pedagogies is crucial. Learning across borders to exchange information. Young people are particularly slow to adapt to climate change. This summer, many parents are hesitant to send their children back to class. Ten questions uncover these issues. Most of the responses are from educators. There were 400 different schools taking part. Over a thousand educators from elementary (grades 3-5) and secondary schools took part in this survey. There will be a focus on the Dhaka area. The highest temperature in Dhaka was 41 degrees Celsius, as reported by AccuWeather, a global leader in weather prediction. The moisture level was also quite low, coming in at about 18%. About 56% of Dhaka’s parks and gardens have disappeared over the past three decades. The percentage of green space in the capital that contains dense forest fell from 17 percent to 2 percent, while the percentage that contains moderate woodland fell from 24 percent to 16 percent. In such a scenario, a “temperature emergency” might be declared, according to a Ministry of Environment, Forests, and Climate Change official who spoke with the media. Climate warming has caused catastrophic heat waves in Bangladesh, India, Laos, and Thailand, according to a report published last month. Due to the ongoing heat wave, all primary government schools in Bangladesh will be closed for four days. How can we keep ourselves and our loved ones safe from the dangerous consequences of heat? What measures can we take as temperatures rise? These topics should be incorporated into the elementary and secondary education curricula so students can get a solid foundation. Ideas on how to mitigate the consequences of extreme heat or heat waves should be included in school curricula. Focusing on “Education for Sustainable Climate Development,” this piece is written for academics and those working in the field. This study looks into ways to avoid it, ways to adjust to it, and ways to mitigate its effects on HW. Based on the results, it’s clear that climate education needs to adapt to accommodate different demographics and the growing urgency of the issue.

Keywords: Heat wave, Sustainability education, Climate Change, Students and Schools

Abstract ID-21:

**ENHANCING BLACK CARBON CAPTURE:
A NOVEL APPROACH USING MODIFIED
CYCLONE AND ZEOLITE SIEVE TECHNOLOGY**

Akash Sood**, **Dr. Sandeep Mohan Ahuja^b**, **Sidhant Kumar Nishad^c**, **Dr. Matsyendra Nath Shuk^d**

Research Laboratory-III, Sant Longowal Institute of Engineering and Technology, Longowal, Punjab – 148106 (INDIA)

Rajkiya Engineering College, Mainpuri, Uttar Pradesh – 205119 (INDIA)

*Corresponding author: akash_pce1801@sliet.ac.in

The world is facing global warming, the earth’s temperature is rising, and if the temperature rises by 1.5 degrees, many glaciers in the world either disappear completely or lose most of their mass (IPCC 2022). If it continues; we will be facing

an unpredictable situation. The main cause of this global warming is due to natural and anthropogenic emissions, mainly CO₂ and carbon soot particles. In India, especially in the Indo-Gangetic plains, the sources of anthropogenic emissions are industrial emissions from various sources, such as based coal-based power plants, brick kilns, and vehicular emissions. To overcome the problem of global warming and estimate CO₂ and carbon particles, we propose to capture concentrations of black carbon which has short-lived air pollutants that contribute significantly to aerosol radiative forcing and global climate change. The knowledge of the spatial and temporal distribution of black carbon especially in rural and urban environments over one of the highly polluted areas, the Indo-Gangetic plains (IGP) in the northern parts of India is very important. The IGP region is home to 900 million people who suffer from poor air quality and highly atmospheric polluted regions over the whole year, summer and winter. The poor air quality and atmospheric polluted IGP are health threats to people living in the region. The present study addresses the measurement of black carbon concentration using real-time mobile and ambient monitoring in traffic areas. The mean ambient black carbon concentration was found to be 1.041±1.032 µg/m³ varying between 0.5 and 4.0 µg/m³. The much higher average value of 16.1 ± 16.5 µg/m³ was measured through conveyance obtained in real traffic conditions on the road. Many parts of the city show black carbon particle concentrations of more than 20 µg/m³. The contiguous distribution of black carbon particle concentrations shows that vehicle emissions and traffic jams are the factors that mostly affect black carbon particle concentrations. There are four strategies to tackle global warming, named as (a) directly reducing greenhouse gas emissions, (b) or indirectly expanding renewable energy employment, (c) more efficient use of energy, and (d) or a wide range of climate policies, as per the bibliometric analysis reports of direct carbon dioxide emission reduction through carbon capture. The research trends in carbon capture within the three main types of technologies, namely pre-combustion, post-combustion, and oxy-fuel combustion. Post-combustion capture is the most refined carbon capture technology with about 80.9% of total publications retrieved, and oxyfuel ranks the lowest with (3.4%) of publications. In our research post-combustion method is used to capture black carbon particles from pollutants. About 80-90% of black carbon can be captured and the rest gas will be released into the air through filtration by activating a carbon filter. Using centrifugal force to capture black carbon particles soot and with the help of adsorbent property in which zeolite molecular sieve will play the role of the adsorbent surface, we will achieve the purpose. Control of black carbon, according to many scientists particularly from fossil fuel sources could be the fastest method of slowing global warming soon.

Abstract ID-23:

**ADVANCING CLIMATE ACTION AND
SUSTAINABILITY THROUGH ARTIFICIAL
INTELLIGENCE: INSIGHTS FROM DATA
ANALYTICS, SMART ENERGY SYSTEMS, AND
SUSTAINABLE TRANSPORTATION**

Dr. K.Thiyagarajan¹, Assistant Professor, Department of Software Engineering – (Computer Science) Periyar Maniammai Institute of Science & Technology (Deemed to be University), Periyar Nagar, Vallam 613 403, Tamil Nadu, India

Prof.R.Kavitha², Assistant Professor, Department of Computer Applications, Bharath College of Science & Management, Thanjavur⁵

Climate change is a critical global challenge that requires urgent action and sustainable solutions. The convergence of artificial intelligence (AI), data analytics, and smart technologies has emerged as a promising avenue to advance climate action and sustainability efforts. This research paper explores the potential of AI and data analytics in addressing climate change, specifically in the domains of smart energy systems and sustainable transportation. The paper begins by highlighting the role of AI and data analytics in comprehending climate dynamics and making evidence-based decisions. With the ability to process vast amounts of data, AI can identify patterns, trends, and causal relationships in climate datasets, enabling accurate predictions and informed decision-making. Data analytics plays a crucial role in extracting valuable insights from climate-related data and integrating diverse datasets for a comprehensive assessment of climate change impacts. Sustainable transportation is another area where AI and data analytics offer significant contributions. The adoption of electric vehicles and intelligent transportation systems reduces greenhouse gas emissions and enhances the efficiency of transportation networks. Public transportation and active mobility modes such as walking and cycling are also crucial for sustainable transportation, and data-driven approaches can optimize their accessibility and reliability. Additionally, the paper explores the role of climate modeling and prediction in assessing the potential impacts of climate change and developing adaptation and mitigation strategies. Climate models simulate future climate scenarios and help identify vulnerable regions, quantify climate-related risks, and inform adaptation planning.

Keywords: Smart Energy Systems, Sustainable Transportation, Climate Modeling, Environmental Monitoring, Climate Risk Assessment

Abstract ID-24:

EDUCATING FOR CLIMATE ACTION AND SUSTAINABILITY

Mr. Vayeda Namra Bharatbhai, Maharaja Sayajirao University of Baroda, Email: vayedabd@gmail.com

Education is crucial to promote climate action, it helps people understand and address the impacts of the climate crisis, empowering them with the knowledge, skills, values and attitudes needed to act as agents of change. Today's upper secondary students will be on the front-lines of the climate transition. We must ensure climate education leads to meaningful student agency.

Cultivating skills for a "just transition"¹⁴ to a green economy/ Building the capacity to adapt Net zero as a path to 1.5°C world/Climate justice/Climate literacy. The challenges at hand, and how the education sector can help:

- Climate Literacy for advocacy & behavior change
 - Cultivating green skills for a just transition to a sustainable economy.
 - Quality education for all as powerful adaptation strategy
- Educators and education leaders/Governments/Employers and corporate citizens/Philanthropies, Civil Society Organizations & Non-Governmental Organizations/ Students, parents, and activists. Positive outcomes require

a broad coalition of actors exerting their influence in the education sphere to mobilize climate action. The power of education for climate action is vastly broader than that. If not, we risk failing to protect the most vulnerable and preserving a harmful status quo, when this moment demands that we empower future generations with the tools & mindsets they need to tackle the climate crisis.

- Climate change, racial inequality, violence, poverty, discrimination is just some of global challenges we can't hope to solve without including the voices of girls and young women. When we educate girls, we empower them to lead in a world affected by climate change and providing quality climate education to addressing devastating impact of climate crisis today.

- The world must recognize education's vital role in preparing people for green economy and helping them adapt build resilience in the face of climate shocks. Education has been virtually absent from critical conversations around climate action and it must urgently become a more central strategy to unlock the system transformations required for a more sustainable and just world. The evidence is clear: we must fund educators, not just engineers!

- Schools need to provide the space and structure for children to act on climate now. They have the potential to be communities where students come together to work on actionable climate solutions, rather than leaving students striking for change outside of them.

- Women are 14 times more likely to die in climate disasters than men (CARE 2021), a staggering fact that illustrates how the poorest women and girls, who contribute the least to the climate crisis, bear the highest burden. However, we know that if you educate these girls, they are more likely to survive and become more climates resilient. And not only that, they will educate the next generation thereby breaking the cycle of poverty and illiteracy and underpinning any of our mitigation and adaptation strategies. The future of the planet lies in the hands of the next generation and that generation has to have access to quality education if we are to not only survive but thrive in a climate-adjusted world.

Abstract ID-25:

A CRITICAL UNDERSTANDING OF NATURE BASED SOLUTIONS (NBS) AND ITS RELEVANCE IN CLIMATE CHANGE EDUCATION IN URBAN SCHOOLS

Bharti Dahiya, School of Educational Studies, Tata Institute of Social Sciences (TISS), Hyderabad, India, dahiyaibharti23@gmail.com

Climate change is the new reality of the contemporary world which people could not deny it anymore either from Global North or Global South. It is affecting all the people around the world but at a different pace in different contexts. For instance, the urban spaces are more adversely affected by sustainability issues. However, it has been discussed over the time that education holds a critical role in achieving an envisioned vision of an equitable and sustainable world. This review paper addresses the nature and relevance of Nature-Based Solutions (NBS) in school education with the objective of taking actions among learners for undetermined future in urban areas due to unsustainability. NBS are solutions inspired and supported by nature and its ecosystems. As opposed to purely technological solutions, NBS are often cost-effective, while they simultaneously provide environmental, social, and economic benefits that build resilience to climate change.

NBS for resilience and mitigation, climate change education, and sustainability education in schools for equipping the learners to take actions are some relevant broader areas have been reviewed as part of this paper. However, in the context of Nature- Based Solutions, education is still unexplored, as it also offers immense prospects not only for bringing awareness, but also to enhance the action taking capacity and building resilience among future generations for addressing local environmental and social challenges in urban areas. Here, the paper suggests NBS approach holds potential in developing the action taking capacities among students about climate change and, also inform teaching- learning practices in school education to tackle the context-based climate and environmental issues of urban ecosystem. Evidence based research is further suggested for its strategies, challenges and implementation in educational research.

Keywords: Nature- Based Solutions, climate change education, sustainability, school education

Abstract ID-26:

INTEGRATING SUSTAINABILITY CONSIDERATIONS INTO INDIA'S EDUCATION FRAMEWORK

Vinod K. Sharma¹, Sangeeta V. Sharma²

1Senior-most Professor and Dean, Indira Gandhi Institute of Development Research, Mumbai - 400065, India

Webpages: www.profvksharma.in; Tel: (91) 98204-97020 / 98203-06155; E-Mail: profvksharma.in@gmail.com / vks@igidr.ac.in

2International Consultant on Sustainability, Mumbai

Integration of sustainability aspects in our education framework is extremely essential. Such integration may help us recognize the outcomes of our actions on local and global environmental ecosystems. Sustainability emphasizes the intricacy and interlinking of the triple bottom line, viz., “planet, people, and profit, representing the environment, society and economy, respectively.” To ensure our sustainable future, our behaviour and actions in present times should be accountable. Education system can play a major role in imparting knowledge and awareness on sustainable development. Education was identified as fundamental to the successful achievement of sustainable development, at the first Earth Summit in 1972 in Stockholm. Subsequently, in over last five decades, several nations have reiterated the importance of sustainability but its progress has been inconsistent and generally unsatisfactory. An important step towards Education for Sustainability (EfS) was initiated in 2005, when the United Nations (UN) adopted a Decade of Education for Sustainable Development (DESD), aiming at “integration of the principles, values, and practices of sustainable development into all aspects of education and learning.”

Historically, lifestyle of most Indians is based on the “4Rs, viz., Refuse, Reduce, Reuse, and Recycle principle.” In fact, the government of India (GoI) has integrated the principle of “sustainability” into its development framework, where all the policies and programmes are based on a five-year planning system. As early as in 1980s, the GoI had set up the Centres of Excellence for Environment Education under the Ministry of Environment and Forests and Climate Change (MoEF&CC). Owing to the wide range of the education system

in the country, the GoI subsequently directed the Ministry of Education (MoE) to integrate environmental aspects into all levels of education. In 1991, the Supreme Court of India mandated introduction of Environment Education (EE) in all schools across the country. However, when the GoI reviewed this directive, it was observed that EE was not being properly implemented. In 2003, the concern for mainstreaming EE was spelt out by the Supreme Court of India in its directive, making EE as a compulsory or a separate subject at all levels of education. In 2004, the National Council of Educational Research and Training (NCERT), was appointed as the nodal agency to formulate the EE curriculum for the school level. Since 2007, the Council for Indian School Certificate Examination (CISCE) conducts board examinations for both the tenth and twelfth grades on EE. Several government and non-government organizations in India are involved in imparting EE. The multinational corporations are also contributing by funding projects on EfS as part of their CSR strategy. However, EE in the country is not yet well equipped to accommodate the complex and dynamic nature of current day environmental crises.

This study reviews the inclusion of sustainability aspects in the education system in India at various levels, viz., primary, secondary, and higher and its impact on the masses. It highlights the importance and shortcomings of sustainability aspects integrated into the Indian education system. It suggests that for inculcating a responsible behaviour and influencing mindsets the people, much more efforts are required in the pedagogical and practical aspects of EfS in the country.

Abstract ID-27:

AGROECOLOGICAL PRACTICES AND ITS SUSTAINABILITY IN TERAJ FARMING SYSTEM OF NEPAL

Prof Umesh K Mandal, PhD¹ and Ms. Kabita Kumari²

1 Head of Central Department of Geography, Tribhuvan University, Kathmandu, Nepal,

umeshmandal@tribhuvan-university.edu.np

2Associated to Bernhardt & Arniko College, Kathmandu Nepal, kabitamandal2033@gmail.com

As mentioned in concept note of this international conference, the present society is suffering from climate change and its diversified effects- due to alarming increase of population. For survival of growing population and its demand of food, fiber and shelter, agriculture has been transformed into modern agriculture, commercial agriculture and intensive agriculture through green revolution aiming to produce more food without considering of sustainability manner. For the sustainability in agriculture, Agroecology is must, Agroecology, since its origin in 1930 has been conceptualized presently as ecology of sustainable food systems previously known as a science (1960), a practice (1980) and a movement (1990) based on scientific and traditional knowledge of farming, it is considered possibly to be addressed people (41 million) at risk due to food insecurity and undernourished (688 million) at the global level. Agroecology focuses on environmental-friendly” or “sustainable” agriculture or agroecosystems on three Es- Environment, Equity and Economics integrating natural system with the social system. Environmental and Agricultural sustainability as the core goal of agroecology can be achieved by making

adjustment in between conventional and modern-industrial agriculture making it environmentally sound, socially just and economically viable and compatible. Agroecology, on the other hand, examines the root cause of the problem instead of addressing the symptoms.

Farming system in Terai region of Nepal are mostly depended on external inputs- heavy machine, chemical fertilizer, pesticides, insecticides and high value crops leading to hazards and infertile soil without considering the capacity of nature and its components. Terai Farming System (TFS) is characterized as flooding method of surface irrigation, paddy and wheat based cropping system, traditional and conventional knowledge of farming, chemical fertilizer dominated input, lack of integration among crop, animal and forestry, women and young led farming, monopolistic market of agriculture produce, pesticide, external production based food habit. India led irrigation water distribution system of Koshi Canal. These characteristics of Terai Farming System are somewhat against of agroecological principles and led to raise sustainability issues in agriculture. This study concludes that agroecological practices to be adopted in existing farming practices for sustainable production and thus it is essential to have agroecological education through its institutionalization by the government.

Key words: Agroecology, Sustainability, Principle, Environment, Equity

Abstract ID-28:

RE-ENVISIONING TEACHER PREPARATION FROM THE PERSPECTIVE OF EDUCATION FOR CLIMATE ACTION AND SUSTAINABILITY

Dr. Alka Behari, Professor, Department of Education, Delhi University, New Delhi-110006 E-mail: alka_behari@yahoo.co.in; alka.behari123@gmail.com Mobile: 9818717894

The paper attempts to provide a valuable window into the complexities of environment issues, policy making and implementations at the ground level. It is being realised, now, that the matter is not just of generating awareness among teachers about climate change and sustainability. What is important is to understand the extent to which the present teacher education programmes equip future teachers with the 'right' skills and attitude in building a greater tomorrow, by contributing to education for climate action. This can have a tripling effect as these teachers would then go to schools and in turn mobilize their students in bringing about environmental literacy and environmental conservation, both as steps towards climate action. Traditionally, teacher preparation has focused upon providing future teachers more with factual knowledge and information related to the environment, with less or no emphasis on enabling them to critically reflect upon deeper issues of environment or empowering them to play a more meaningful and significant role as practitioners in the field of school education.

This may be further explained in the backdrop of Goal 13 of the Sustainable Development Goals, which emphasizes that an urgent action has to be taken to combat climate change and its impact. And the goal target includes an improvement in education and integration of climate change measures into national policies, strategies and planning. Drawing from this perspective, the question posed is: what specific roles can teachers play in educating young learners

for climate action and sustainability? The link with school education and its curriculum becomes evident, as Nerini et al (2019), in a different context, put it as, 'Knowledge concerning relationships between sustainable development and climate action are scattered across many disciplines. This fragmentation is a critical barrier to a holistic and integrated understanding of the social-environmental systems that the Sustainable Development Goals embody. Understanding the potential impacts of climate change in all sustainable development goals is crucial to raise awareness and policy support for climate change.' In the Indian context, subsequent to the new NEP (2020), the recent National Curriculum Framework for School Education (2023) has also viewed Environment as a cross-cutting theme across all school subjects/areas. It focusses on the need for the curriculum to present possibilities and positive examples of actions to contain or reverse environmental damage.

In the light of the above background, the objective of this paper is to present and analyse the perceptions of teacher educators working in Teacher Education Institutions and in-service teachers about the adequacy of the existing programmes. A case-study method involving qualitative analysis of data based on in-depth observation of a Teacher Education Institution has been used. The study, further, provides suggestions for a more holistic integration of Education for Climate Action and Sustainability within the curriculum and pedagogy.

Abstract ID-29:

WONDER WEEVIL FOR WATER HYACINTH CONTROL

Amitasha Soni, Student Class 9th, DPS-Bilaspur, Chhattisgarh, India and **Sasha Soni**, Student Class 6th, DPS -Bilaspur, Chhattisgarh, India, Contact: 9302463410, 9424143102, e-mail: amitashasoni@gmail.com Guided By: Mr. Panu Halder

Water hyacinth, a native of Brazil was introduced in Calcutta Botanical Garden way back in 1895 to decorate garden ponds. Subsequently, this aquatic plant which decorated the garden ponds, village lakes, streams etc. spread across the country. It has an alarming multiplication rate & doubles in as little as twelve days. With an alarming multiplication rate, this ornamental aquatic plant gradually proved to be a menace. Water hyacinth, 'Eichhornia crassipes' is a floating aquatic plant grows in lakes, streams, ponds and even anchored in mud. It forms dense mats over the water preventing oxygenation and alters ecology of the water body. It also severely impedes the flow of water in canals, thereby reducing availability of water to farmers' field.

A water body, once affected with water hyacinth, degrades its water quality, loses its beauty and utility. Generally, it becomes the ideal place to deposit waste materials reducing its depth and width. Finally, the water body itself gets extinct. Best method to control water hyacinth is to protect water bodies from its clutches only. Yet only two methods are available i.e., mechanical method and chemical method, but they are not effective and sustainable means because mechanical removal of water hyacinth is labour intensive, hence expensive, and only possible in relatively small areas. Chemical operation is done mainly by using herbicides which can definitely destroy the grown-up vicious weed but at the cost of Leaving the environmental effects.

This calls for an urgent need for an eco-friendly and sustainable biological method to save our waterbodies from the captivity of water hyacinth.

With the small amount of research and studies, I found that *Neochetina Eichhornia* is effective under the climatic conditions of most part of India and able to clean vicious aquatic weed, water hyacinth, which poses a great threat to the socio-economic development and environment of India.

Biological control is engagement of host specific natural enemies to reduce the population density of a noxious pest or weed. It is said to be environmentally benign, as the control agent tends to be self-regulating. Control programmes are usually inexpensive due to the fact that the control agents once released in a water body will multiply by themselves and hence making biological method less labour intensive.

In the era of global warming, where we are attempting everything possible to save our nature, we should strive hard to work on biological and eco-friendly methods to save our water bodies from the deleterious impact of water hyacinth.

Keywords: Biological, *Eichhornia*, *Neochetina*, host-specific

Abstract ID-30:

ENVIRONMENTAL EDUCATION AND SENSITIVITY TOWARDS SUSTAINABILITY: PEDAGOGICAL REFORM THROUGH NATIONAL EDUCATION POLICY (NEP) 2020

Dr Satabdi Das, Assistant Professor, Department of Political Science South Calcutta Girls' College
Email: satabdi@southcalcuttagirlscollege.com

The process of developing an environmentally literate citizen requires proper understanding and knowledge about the conservation of the natural and cultural resources of the surroundings. Environmental education has the ability to impart a great deal of environmental consciousness among young minds to bring concerns for sustainability, explore ecological issues, and participate in problem-solving. All these contribute to making informed and responsible environmental decisions. India like other countries has taken key initiatives in providing environmental education to establish sensitivity towards environmental sustainability. Against this background, the NEP is a case in point that makes efforts to integrate environmental education as part of curricula at different levels.

Research Questions:

- How does the NEP 2020 help in infusing environmental education in pedagogy at different education levels?
- Does it fulfil the need for environmental education for all?
- How environmental education helps in generating awareness among students for attaining SDGs?
- Can it be possible to transform the rhetoric of building environmental sensitization to reality through the reform of curricula by NEP?

Method: The study includes a descriptive-analytical method
Findings:

- Environmental education in India has been prioritized in all curriculum development programs. The existing school curriculum as designed by NCERT reiterated the importance of environmental education across all stages of school

education (foundational, preparatory, middle, and upper stages). The purpose is to integrate environmental awareness and sensitivity to natural conservation and sustainable development into the syllabi. The science, social science, and language textbooks also infuse environmental concerns.

- In 2003, University Grants Commission following the Supreme Court directives incorporated Environmental Studies at the undergraduate level in the core module syllabus. In 2017, again an 8-unit module syllabus for the Ability Enhancement
- Compulsory Course (AECC-Environmental Studies) under the Choice Based Credit System (CBCS) had been introduced.
- In order to attain holistic and multidisciplinary education, the NEP 2020 has advocated a flexible and innovative curriculum for all higher education institutions (HEIs) where guidelines and curriculum frameworks for environmental education have been envisaged. It talks about credit-based courses and projects associated with environmental education. One of the leading universities of India, the University of Calcutta has incorporated environmental education (ENVS) into the common value-added courses (CVAC) of the first 2 semesters as compulsory in its curriculum.
- Through pedagogical reform, the NEP 2020 tries to open avenues for students to be conscious of the SDGs related to environmental protection and resource conservation while pursuing higher education.

Conclusion: Incorporating environmental education in syllabi does not guarantee the building of environmental awareness for all. Though the NEP 2020 talks about "Access, affordability, equity, quality and accountability", the need for educational opportunity can be materialized through an effective system to support learning. India has a critical no. of drop-outs at different educational stages due to poverty, gender inequality, and many other social ills. So, a pedagogical reform is not enough for learning about the environment, through the environment, and for the environment.

Keywords: NEP 2020, Environmental Education, SDGs, UGC

Abstract ID-31:

BIOMIMICRY AND BATTERIES-TOWARDS SUSTAINABLE ENERGY STORAGE

Dhiksha Mohan, Lead: Energy Storage vertical, Terracarb Private Limited, Trichy Road, Coimbatore
Email: dhiksha@terracarb.com

With rising global energy demands and the electrification of transport, battery technology has emerged to be an inevitable area of focus. Rapid research and development are being made in advancing the architecture, chemistry, material, lifecycle, and recycling techniques of a battery. Despite the promising results, batteries' manufacturing and disposal techniques involving toxic elements like Lithium, Nickel, Cadmium, etc., raise several direct and indirect environmental implications. This research puts forth a nature-inspired approach to understand how energy is harvested and stored in the natural paradigm to build mutually beneficial, sustainable, interconnected, and biomimicked energy storage devices. Surviving 3.8 billion years on the planet, life on earth has evolved and sustained with minimal energy, eco-friendly chemistries, and excellently efficient systems, which are the very essential features that mankind is looking for in building sustainable batteries.

Objective:

The research solely focuses on discovering life-conductive energy storage solutions that use abundant resources, design prints, forms, processes, and materials that are already co-existing in the natural world to mitigate the man-made problems of 'climate change, 'waste' and 'demand' in the energy industry.

Methods & Results:

The available and limited scientific literature regarding nature-inspired battery technologies was reviewed and inferred. The research study focused on all the existing and documented nature-inspired battery inventions and innovations and was not limited to the solution concerning a specific battery component. The gaps in the literature, existing methodologies, and future directions concerning biomimetic batteries were identified.

Implications:

Thus, this study evidences and stresses that it is imperative that we turn towards nature for designing, manufacturing, and recycling potential and life-friendly energy storage devices. It also serves as a call to action for all researchers and scientists focusing on energy and natural sciences to gravitate toward a bio-inspired perspective and framework for the future of energy storage.

Abstract ID-32:

STUDYING THE ROLE OF SHIFTING AGRICULTURE OF NORTHEAST INDIA FOR SUSTAINABLE LIVING: A MINI REVIEW

Peimi Lungleng^{1*} and Tuisem Shimrah¹

¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Golf Course Rd, Sector 16 C, Dwarka, Delhi, 110078
Email: *peimi.lungleng@gmail.com

Shifting agriculture is a traditional agricultural farming practice involving slashing of vegetation and burning the slashed remnants to acquire nutrients in the soil to support the cultivation of crops for few years before the area is left for fallow. This land use system is still practiced predominantly in the mountainous region of Northeast India. Shifting agriculture has been sustainable because of relatively longer fallow periods (10-20 years), however, due to the increase in population the fallow period has been reduced to 3-5 years which has led to jeopardizing of forested land, degradation of soil, biodiversity loss, habitat fragmentation and other natural resources. The tribal communities of the Northeast have been discouraged from engaging in shifting agriculture as a result of the pervasive perception that it is primitive and unsustainable. Nevertheless, many scholars and researchers has questioned this view and recapitulation of such perception has conventionally been regarded as an environmentally and economically viable form of land use, numerous scientific and agro-ecological researchers have depicted that shifting agriculture is perhaps more sustainable than settled agriculture and monoculture. In addition to being an alternate method of farming, this traditional agricultural practice is also a means of managing the land that has developed over generations of experimentation and is intimately linked to the culture and way of life of the people who remain involved in shifting agriculture.

Keywords: Northeast, agriculture, sustainable, traditional.

Abstract ID-33:

DEVELOPMENT OF RELATIONSHIP BETWEEN DIFFERENT LAND INDICES USING GEOSPATIAL TECHNOLOGY

'Tanu Prakash^{*} and 'Tuisem Shimrah

¹University School of Environment Management, uru Gobind Singh Indraprastha University, New Delhi-110078, India, Email: *tanuprakash3@gmail.com

In many parts of the world, the human population is increasing rapidly due to industrialization and urbanization. Unfortunately, these developments have negative impacts on people. Unplanned urbanization is a major environmental problem in developing countries because it often leads to the loss of open and green spaces. As urban areas expand, vegetation cover decreases and more impervious surfaces such as buildings, parking lots, and pavements are created. This can cause environmental pollution, water pollution, climate change, greenhouse gas emissions, and disruptions to ecological cycles. South Delhi district is one of the 11 districts of the NCT of Delhi, covering 16.65% of the total area of the NCT of Delhi. To understand the impact of urbanization on this district, we used geographic information and remote sensing to analyze the Land Surface Temperature (LST), the Normalized Difference Vegetation Index (NDVI), and the Normalized Differential Built-up Index (NDBI) within the urban area. We found that there was a strong negative correlation between NDVI and LST, and a positive correlation between NDBI and LST. These results indicate that the increase in population density, urban growth, and infrastructural developments in the South Delhi district have led to a decrease in greenness. The outcomes of our study will be used to inform regional and urban planning.

Keywords: Climate change; remote sensing; land surface temperature; normalized difference vegetation index; normalized difference built-up index; GIS

Abstract ID-34:

EVALUATING THE EFFECTIVENESS OF INDIAN WILDLIFE PROTECTION LAWS: AN ANALYSIS OF ENFORCEMENT AND PROSECUTION EFFORTS

Renu Singh^{1*}, Janmejy Sethy¹ and Satyaranjan Behera²

¹Amity Institute of Forestry and Wildlife, Amity University, Gautam Budhh Nagar, Sector-125, Noida Uttar Pradesh
²Odisha Biodiversity Board, Regional Plant Resource Centre, Bhubaneswar
Correspondence email id- renusinghifs1997@gmail.com

Law enforcement is one of the weakest links in wildlife conservation. This paper analyses the main challenges facing wildlife law enforcement in Uttar Pradesh India and identifies the enforcement strategy used by wildlife officers in the region. The study is to utilize involves review and critical analyses of both secondary sources of data; collected through the survey by way of visits to different

forest offices, documentation centres, and websites of national organizations working in wildlife law and policies and conservation in particular. To this end, a questionnaire was distributed to the wildlife officers. The study found that the respondents tended towards deterrence strategy in enforcing the laws which focuses on detecting and punishing violations. The study also revealed that the primary challenge facing wildlife enforcement officers was a lack of institutional capacity. This was reflected by problems related to inadequate equipment, facilities, limited manpower and lack of skills. Other major challenges highlighted by the respondents were lack of cooperation from the public and other enforcement agencies, lack of political will and threats from the regulated parties. The findings of the study contribute to a greater understanding of the main enforcement strategy used by wildlife officers in Uttar Pradesh and highlight challenges they encountered in undertaking their duties. These insights provide useful information for developing better informed capacity-building programmes for wildlife officers and for decision-makers at the state and federal levels in determining allocation or other provisions for the wildlife authorities.

Abstract ID-35:

EFFECTIVENESS OF PHYSICAL BARRIERS IN MITIGATING HUMAN-ELEPHANT NEGATIVE INTERACTIONS IN NORTH-EAST INDIA

Gitima Das^{1a}, Kanagaraj Muthamizh Selvan², Bibhuti Prasad Lahkar³, Govindan Veeraswami Gopi^{1b}

1a Post-graduate Programme in Wildlife Science, Wildlife Institute of India, P.O. Box #18, 3 Chandrabani, Dehradun, Uttarakhand 248001, India.

2Project Elephant, Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan 6 Jorbagh Road, New Delhi 110003, India.

3 Elephant Research & Conservation Division, Aaranyak, 13 Tayab Ali Byelane, Bishnu Rabha Path, 9 Beltola Tinali-Bhetapara Link Road, Beltola, Guwahati, Assam 781028, India.

1b Department of Endangered Species Management, Wildlife Institute of India, P.O. Box #18, 12 Chandrabani, Dehradun, Uttarakhand 248001, India

Physical barriers, like solar fences, elephant-proof trenches, stone, or rubble walls, are installed as conflict mitigation interventions in India's major Asian elephant (*Elephas maximus*) ranges. However, installations lacking a priori scientific assessment of site specificity for reducing elephant incursion in the human settlements often fail in the intended goals of the resource-intensive management interventions. Since humans are central to conflict issues, research focusing on social aspects is essential for devising solutions. Despite the use of barriers in the Golaghat district in Assam, human–elephant conflict (HEC) cases are increasing, which offers an opportunity to evaluate their efficacy. Optimized hotspot analysis of the historic HEC records from 2010 to 2019 was done to check the spatial extent of the conflict and its dispersion in the district. We also assessed the efficiency of a 4.2-km long solar fence and a 2-km long elephant-proof trench through generalized linear modeling. We evaluated the encounter rates of elephant signs and other site covariates at the barrier and non-barrier sites. Multinomial logistic regression was applied to assess the perception of local people on the barriers and overall, HEC in their areas based on their willingness to pay (WTP) for maintenance

of the barriers. The highest cases occurred between 2016 and 2017, making up 25% of the total conflict cases. It was noticed that the extent of these hotspots was concentrated, and there was no dispersion of the conflict to other areas. Furthermore, a significant difference in the encounter rates of elephant signs between barriers and no barrier sites was observed. Solar fenced areas showed relatively lower encounter rates than areas with the trench, suggesting better efficiency of solar fencing than trench in the landscape. In addition, only five out of seven explanatory variables, viz., the persistence of HEC cases, amount of ex-gratia compensation, time taken in getting compensation, change in elephant behavior (incursion), and crop-raiding frequency significantly explained people's perception of the barrier and non-barrier sites. According to local people, physical barriers are essential in managing HEC; hence, installing and maintaining solar fences in the high conflict hotspots is crucial for this landscape.

Abstract ID-37:

REVEALING THE BLUE TERROR OF INDIA: A SYSTEMATIC REVIEW ON HUMAN-NILGAI CONFLICT THROUGH PRINT MEDIA REPORTS

Mr. Chandrapratap Singh Chandel, Department of Zoology & Environmental Science, Gurukula Kangri (Deemed to be) University, Haridwar, 249404, and Wildlife Institute of India, Dehradun, 248001, Uttarakhand, India
E-mail: chandrabiology35@gmail.com

Despite being a conflict-prone species in its native ranges, the nilgai antelope has been a subject of little scientific and management attention. To address this knowledge gap, we obtained information on human-nilgai negative interactions at the regional scale (sub-district level) across different states of India based on a systematic survey of print media reports. Our findings revealed that Bihar state has the highest number of affected sub-districts (78) and conflict cases (313), followed by Uttar Pradesh (42 sub-districts; 134 cases) and Madhya Pradesh (40 sub-districts; 154 cases) states. Among different conflict categories, crop raiding by different populations of nilgai had the highest relative frequency of occurrence (76.63%), followed by nilgai-vehicle collisions (18.75%). Although human deaths and casualties occurred in some incidences, attacks on humans by nilgai were rare (1.9% of cases), and farmers were the victims. It was found that nilgai raided 45 types of crops during 2018–2022. However, vegetable crops had the highest relative frequency of raids (30.47%), followed by cereal (23.6%) and pulse crop (17.32%) categories. Oil yielding crops were raided the least (6.19%). The rate of nilgai-vehicle collisions was estimated to be 13.8 cases per year in the country, and human injuries (46.74%), both serious and minor, were the most common outcome of these interactions. We have identified the priority areas in the country at the regional scale where future studies aiming at nilgai population dynamics, nilgai-crop interactions, and their movement ecology can be carried out to formulate effective mitigation measures.

Abstract ID-38:

DEMOCRATIZING CLIMATE KNOWLEDGE: MAKING CLIMATE CHANGE EDUCATION ACCESSIBLE TO ALL

^{1,2} **Rahul Chopra** (rahul.chopra@flame.edu.in),
^{1,2} **Sanjana Singh** (sanjana.singh@flame.edu.in),
^{1,2} **Sanchit Sant** (sanchit.sant@flame.edu.in), &
^{1,2} **Manjula Nair** (manjula.nair@flame.edu.in)

¹ Centre for Sustainability, Environment, and Climate Change, FLAME University, Gat No. 1270, Lavale, Pune - 412115, Maharashtra, India

² Project TROP ICSU of the International Union of Biological Sciences, Bat 442, Université Paris-Sud 11, 91 405 Orsay Cedex, France

Climate change is one of the most significant issues of our times. It affects the sustainable and equitable development of all countries and their citizens. Solutions to the climate crisis require that the population is aware of the issues. As climate impacts are not the same across the world, measures to mitigate climate change will involve solutions that are locally rooted but based on global science. The integration of sustainability education, specifically climate change education into the formal education system can equip current and future generations across the world with key skills to determine locally relevant solutions for building a climate resilient, just, equitable and sustainable society.

Project TROP ICSU (Transdisciplinary Research Oriented Pedagogy for Improving Climate Studies and Understanding) (<https://climated.org> ; <https://tropicsu.org>) is an open access, free to use education platform that integrates climate change education into the mainstream education system across the world. We have developed, collated, curated, and validated a repository of over 800 teaching resources (including lesson plans with detailed, step-by-step guides) from across the world that can be used by all teachers to integrate climate education with their everyday teaching. This platform contains teaching resources that are locally rooted but globally relevant for their science, and are designed to promote interdisciplinary thinking. They have been developed by experts and undergo a multi-stage review. The resources have been mapped to topics in the syllabi of 10 disciplines, grade levels, climate topics, type of tools, locations, languages, and internet and computer accessibility.

Project TROP ICSU has trained over 1000 teachers in 11 countries and demonstrates how to effectively address the climate crisis through innovative pedagogical approaches and methods. We have curated teaching tools and developed detailed lesson plans as teaching aids for teachers to teach topics in the existing curriculum with the help of an example, case study, or activity related to climate change. The use of these interactive and engaging educational resources will help students enhance their conceptual understanding of topics in their disciplines, stimulate critical thinking, and simultaneously, increase the knowledge and awareness of the science of climate change. In addition to addressing this critical issue through interdisciplinary teaching and learning, the project also demonstrates how to effectively engage with today's learners through the use of digital teaching tools such as visualizations, models, video micro-lectures, hands-on classroom/laboratory activities, games, and readings. Learning is most effective when it is localized and in the learner's language. Our teaching resources include local climate stories, lesson plans on climate impacts in every country, and some resources in different languages. Our resources developed by global experts undergo a strict review process and help in making scientifically accurate

quality climate change education accessible to all.

The project is led by the International Union of Biological Sciences and the Centre for Sustainability, Environment and Climate Change at FLAME University, India and has more than 20 global partners that include science unions, national academies of countries, research centers, and UN agencies (<https://climated.org/people-partners/>).

Abstract ID-39:

HOURLY VARIATION OF MESOZOOPANKTON AND ENVIRONMENT OF THAKURAN ESTUARY, INDIAN SUNDARBANS

Jhinook Mitra¹, Debarati Sengupta¹, Sourav Paul¹, Bhaskar Deb Bhattacharya^{1*}

¹Estuarine and Coastal Studies Foundation, 112, Deshapran Shasmal Road, Howrah, West Bengal 711101.

Email: estuarycoast@gmail.com

*Corresponding author: debbhaskar777@gmail.com

Hourly variation of mesozooplankton and environment of Thakuran estuary, Indian Sundarbans, was studied. Mesozooplankton were sampled from stations S1 (22°07.992' N 88°48.989' E) and S2 (21°47.480' N 088°27.409' E) located near the head and mouth of the estuary, respectively, in December 2022, for 12 hours (from 20:00 to 09:00 next day) using a zooplankton net (mesh size 200µ, diameter 60cms) mounted with a mechanical flowmeter. Nitrate-nitrogen, phosphate, silicate and chlorophyll-a concentrations, temperature, salinity, pH, total dissolved solids and depth were measured on hourly basis. Copepods dominated the mesozooplankton community constituting 85.70–100%. Calanoid copepods shared the bulk of biomass representing 17 (S1) and 25 (S2) species of 13 genera, followed by cyclopoids comprising 5 species of 3 genera and lastly 2 harpacticoids at S1 and 1 monogeneric harpacticoid at S2. Apart from copepods, chaetognaths, decapod larvae and Lucifer contributed significantly to the total mesozooplankton count. At S2, water temperature ($t=-4.73$, $df=11$, $p < 0.001$), salinity ($t=-2.78$, $df=11$, $p=0.02$), pH ($t=-6.33$, $df=11$, $p < 0.001$), TDS ($t=-3.54$, $df=11$, $p=0.005$), depth ($t=-5.29$, $df=11$, $p=0.003$) significantly declined but chlorophyll-a ($t=4.40$, $df=11$, $p=0.001$) concentrations rose during the study. Acartiidae and Pseudodiaptomidae maintained a negative relationship with other families. At S2, Acartiella tortaniformis, Oithona brevicornis, Paracalanus parvus and Bestiolina similis formed a separate cluster at 70% level of similarity, being the most dominant throughout the study. At S1, the most dominant Paracalanus parvus formed a cluster at 80% level. Shannon-Wiener Diversity Index was found to be high at S2 (3.07±0.06). Omnivorous copepods dominated the herbivores and carnivores. Canonical Correspondence Analyses reveal salinity, depth, chlorophyll-a and nitrate concentrations to be the major regulating factors of mesozooplankton distribution at S1; while temperature, chlorophyll-a and phosphate at S2. The results reveal minute variations in mesozooplankton community structure despite contrasting environment of different microhabitats of an estuary. Being interconnected with fishes via trophic relationship, behaviour, ecology and their susceptibility to the impacts of climate change, the monitoring of hourly variation of plankton community is recommended.

Keywords: Copepod community, diversity and distribution,

ecological monitoring

Abstract ID-40:

EDUCATING FOR A SUSTAINABLE FUTURE : EMPOWERING MINDS TO COMBAT CLIMATE CHANGE

Ms Poojashree Balamurugan, Stella Maris College, Chennai, Email: poojabala1016@gmail.com

Climate change poses one of the most pressing challenges of our time, with far-reaching consequences for the environment, society, and economy. As the world grapples with the alarming impacts of anthropogenic activities on the planet, education emerges as a crucial tool to address the complex issues of climate change and sustainability. This research paper explores the role of education in raising awareness, fostering sustainable mindsets, and empowering individuals to take meaningful action.

The paper begins by analyzing the current state of climate change education and its integration into formal curricula at various educational levels. It identifies gaps and challenges in the existing approaches and highlights the need for a comprehensive and multidisciplinary approach to address climate change and sustainability issues.

Furthermore, the research investigates the impact of non-formal and formal education on climate change awareness. It explores the role of media, community initiatives, and online platforms in disseminating information and fostering public engagement in sustainability efforts.

The paper also addresses the significance of educators and their role as catalysts for change. It highlights the importance of professional development and training programs for teachers to equip them with the necessary knowledge and skills to incorporate climate change and sustainability into their classrooms effectively.

Moreover, the research examines the potential of technology as a transformative tool for climate change education. It analyzes the use of virtual simulations, augmented reality, and online resources to create immersive learning experiences that inspire environmentally responsible behaviors.

Finally, the paper explores the impacts of climate change education on students' attitudes, behaviors, and decision-making processes. It investigates how well-informed and engaged citizens can become agents of change in advocating for sustainable practices within their communities and beyond.

In conclusion, this research paper emphasizes the critical role of education in tackling climate change and promoting sustainability. By fostering a deeper understanding of environmental challenges, empowering individuals to adopt sustainable behaviors, and encouraging collective action, education can play a pivotal role in building a more resilient and sustainable future for generations to come.

Abstract ID-42:

CARBON SEQUESTRATION BY WETLANDS: A REVIEW

Taruna, Pamposh

Email: tchopra8997@gmail.com

Guru Gobind Singh Indraprastha University

The climate change effects due to the rapid rise in the atmospheric greenhouse gases has resulted in ecosystem disruption, danger to water security and unhealthy environment. Researchers expect wetlands to be the solution of this climate change due to their enormous life-sustaining ecosystem services towards humanity and environment. Apart from the various important ecosystem services provided by the wetlands namely, water quality improvement, flood management, water purification and many more, one of the most attractive ecosystem services is carbon management. Wetlands are considered as the most important carbon sinks due to optimum natural environment provided for carbon sequestration and long-term storage of carbon dioxide from the atmosphere. But changing the hydrology of wetlands can reduce its carbon sequestration ability and may lead to the release of previously stored carbon in the wetlands. Proper management of wetlands may help in potential carbon sequestration and storage by wetlands. Once the different carbon moieties reach the wetlands by surface or sub-surface runoff, they are either consumed for aquatic primary production or oxidized in the water column or emitted to the atmosphere. The carbon stored in soil as organic matter may be released in water or in the sediment and finally released as carbon dioxide and methane. Wetlands are the ecosystems that help in feedback mechanism to global climate change with the help of carbon sequestration. The national projects on assessment of greenhouse gas emissions are considering the ability of wetlands in Carbon Sequestration. Moreover, private sectors have also taken initiatives for generation of revenue for management of carbon balanced ecosystems. Before implementation of these initiatives worldwide, formalization and standardization of characteristics of wetland carbon science is required.

Abstract ID-43:

UNDERSTANDING PLANT AVIAN FRUGIVORY IN URBAN LANDSCAPES OF DELHI

Divya and Rita Singh*

University School of Environment and Management, Guru Gobind Singh Indraprastha University, Sec-16C, Dwarka, New Delhi-110077

*Corresponding author: rsinghipu@gmail.com, 09818792414
Email: divya.2616390019@ipu.ac.in, 09870723343

Plant-avian interactions are important ecological processes that play vital role in maintaining the biodiversity. Urban landscapes are highly transformed anthromes and slight disturbance in mutualistic interactions between plants and avian frugivores as result of anthropic activities can instigate the alterations in the ecosystem. Very little is known about the structure of avian-plant interactions in the urban ecosystem therefore the study was done to identify the new dynamics in Delhi's human-dominated landscape that comprises urban green spaces with planted exotic and native tree species. In the present study, phyto-centric approach was used to identify the new avian feeding interactions and analogies between exotic and native tree species in the urban green spaces of Delhi were identified to address the relationship between biodiversity and ecosystem functionality supporting that adaptation in frugivore-plant networks drives the seed dispersal process. As a unique

ecosystem, understanding plant-frugivore interaction is critical for structuring and maintaining its heterogeneity and diversity of the urban flora in urban green spaces. This will further help in implementation of sustainable green spaces with an emphasis on cultivating native fruit-bearing tree species, adapted to the local environment that serves as rewards for frugivorous birds thereby helping in mitigating urbanization's fragmentation effects, thus fostering biodiversity conservation and ecological balance.

Keywords: plant-avian interaction, anthromes, Delhi, phyto-centric approach

Abstract ID-44:

COMPARATIVE EVALUATION OF THE FLORISTIC DIVERSITY OF NAJAFGARH CANAL, DELHI, INDIA.

Pooja, Guru Gobind Singh Indraprastha University, Sec-16C, Dwarka, New Delhi-110078
Email id-pooja002795@gmail.com

Rita Singh, Guru Gobind Singh Indraprastha University, Sec-16C, Dwarka, New Delhi-110078
Email id-rsinghipu@gmail.com

Pamposh, Guru Gobind Singh Indraprastha University, Sec-16C, Dwarka, New Delhi-110078
Email id-pamposh@ipu.ac.in

The Najafgarh drain is the first significant drainage system to flow into the Yamuna River at Wazirabad in Delhi, India, is renowned to add the most pollution to this river. The drain was purposefully built as a stormwater canal and was initially an extension of the Sahibi River. However, it is now transporting additional sewage, agricultural, and industrial effluents that have been collected through numerous small and big secondary drains. The Najafgarh Canal enters Delhi from Haryana from the south-west corner of Delhi. It traverses a length of 51 km before joining river Yamuna. In its initial stage through south-west district of NCT Delhi, it carries flood water, wastewater from Haryana and surface runoff from the adjoining catchment. Nearly 60% of the length of Najafgarh Canal flows through south-west district of NCT Delhi. This wetland provides abundant macrophytic species for their nutrition. Aquatic plants play a very important role in wetlands because they provide food and habitat to fishes, wildlife and other aquatic organisms and also play very significant role in removing pollution and making our environment green and clean. Since the publication of Flora of Delhi in 1963, no floristic work has been published from the Najafgarh Lake or its drain sites, only After that a survey of selected sites of Najafgarh Drain was carried out in 2018-19. The aquatic flora of the Najafgarh canal from Dhansa to Wazirabad is compensated in this study using a comparative analysis with a Preliminary Study on the Floristic Diversity of the Najafgarh Drain, South West Delhi 2021 and the Flora of Delhi, 1963. The aim of the presented work is to evaluate the comparative assessment with a Preliminary Study on the Floristic Diversity of the Najafgarh Drain, South West Delhi 2021 and the Flora of Delhi, 1963.

Abstract ID-45:

ASSESSMENT OF LAND USE AND LAND COVER CHANGES OF DAMDAMA WETLAND, GURUGRAM

Sushma and Neetu Rani*

University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078, India

Email: sushmayadav2706@gmail.com,

*neetu_rani@ipu.ac.in

Deterioration of water quality, habitat loss, and degradation of terrestrial and aquatic ecosystems, are serious global environmental concerns. Over the years, wetland ecosystems have undergone significant changes because of human activities particularly urbanization, agriculture, and industrial expansion. The principal objective of this study was to monitor the in and around changes over Damdama wetland using remote sensing and geographic information systems. The Land use and land cover changes in Damdama wetland were analyzed for the period of 2010-2020 using ERDAS Imagine version 2014. The classification was based on six different classes i.e., agriculture, barren land, built-up, fallow land, vegetation and waterbody using maximum-likelihood supervised classification. The resulted Land use and land cover changes map showed barren land, built-up and fallow land increased by 9.6%, 4.13%, and 1.38% respectively whereas agriculture, vegetation and waterbody decreased by 6.5%, 8.42% and 0.19%, respectively. Overall accuracy was found to be 92% for 2010 or 94% for 2020. Overall, such transformation may pose a serious threat to wetland ecosystem in future.

Keywords: Geographic Information System, remote sensing, wetland, urbanization

Abstract ID-46:

COMBATTING CLIMATE CHANGE WITH SUSTAINABLE MEASURES: A CASE STUDY OF MOUSUNI ISLAND, INDIAN SUNDARBANS

Tanushree Bose¹, Shreya Das^{1#}, Kamalika Mondal¹, Kanailal Das^{1*}, Joydeep Saha² and Karabi Das³

¹Estuarine and Coastal Studies Foundation, West Bengal, India.

²Department of Geography, Bijoy Krishna Girls' College, Howrah, West Bengal, India.

³Department of Geography Dr Kanailal Bhattacharyya College, Howrah, West Bengal, India.

#Equal contribution authors

*Corresponding author: kanailaldas17@gmail.com

Since 1880 earth's temperature has increased by an average of 0.087 degree Celsius which has resulted in increasing frequency of cyclonic occurrences, especially in Bay of Bengal. Coastal islands of Indian Sundarbans have faced the wrath of cyclones like Aila (2009), Bulbul (2019), Amphan (2020) and Yaas (2021) in this scenario of climate change. Rising sea level (3.14 mm/year) has increased the rate of cyclonic occurrences and river dynamics such as tidal surges trigger the breaching of embankment and saline water intrusion. Located in the southern part of Ganges delta facing the Bay of Bengal, Mousuni Island of the Indian part of Sundarbans has also faced the vulnerability of cyclone. It is a home of 3578 people (Census, 2011). Along the western bank of the island about 3.82sqkm land was reduced by coastal erosion (1979 -2011; Das,2022). The objective of the study is to assess the suitability of embankments to combat the effect of climate change. To fulfil the objective, the methodology of both

quantitative and qualitative approaches was undertaken. Quantitative methods like measuring various parts of the embankments and observation of embankment design (Aila embankment, earthen embankment, and wooden log embankment) were undertaken. A beach profile was done to observe the effects of coastal erosion on the beach with the help of dumpy level. Qualitative study in the form of interview was undertaken on residents (N=10). Based on the study, more preference was given on concrete embankment specially Aila embankment than earthen embankment as it is not able to combat erosion and the vulnerability of cyclone. Incoming saline water as a result of breaching of embankments disrupted the agricultural system for long period increasing the vulnerability of the residents. Cyclone Bulbul followed by Amphan has demolished 80% of island's households. While the north western part of Mousuni has permanent concrete embankment (Aila embankment from Kusumtala to Baliara bazar), the southern part has Earthen embankment covered with geo jute. There is a multipurpose cyclone shelter situated near Baliara but it is not accessible to all during the hazard (verified by locals). In the present scenario, concrete embankments designed as per the norms of Aila embankment along with a mangrove buffer due to sea level rise of around 5.7mm/year at Diamond Harbour (INCCA, 2010) is preferable to be maintained at Baliara. To cope up with climatic extremities, capacity building should be promoted.

Keywords: Cyclonic occurrence, sea level rise, embankment, sustainability, capacity building

Abstract ID-47:

THE 5S OF SUSTAINABILITY: APPLICATION OF WHOLE SCHOOL APPROACH FOR SUSTAINABILITY IN GSF SCHOOLS

'Smita Warnekar, 'Rathin Khandhadia & 'Sweety Gathani

1Global Schools Foundation, 27 Punggol Field Walk, Singapore 828649, Email ids: smita.w@globalindianschool.org, rathin@myglobalschool.org, sweety.gathani@globalindianschool.org

In a world increasingly grappling with environmental challenges and social issues, the role of educational institutions in shaping responsible and environmentally conscious citizens has never been more critical. The Global Schools Foundation (GSF) recognizes this responsibility and has developed the "5S of Sustainability" framework to instil environmental consciousness and social responsibility among students while seamlessly integrating sustainable principles into all aspects of school operations and curriculum based on whole school approach to sustainability. The framework comprises five interconnected pillars that span the entire school ecosystem.

The first pillar, "Structure & Governance," establishes effective governance structures to address sustainability-related matters at both the group and school levels. By providing guidance, direction and leading team. The "Students & Learning" pillar emphasizes the responsibility of educational institutions to cultivate future responsible citizens. Our schools achieve this through curriculum integration, where sustainability concepts are interwoven across subjects, creating a seamless learning experience.

Additionally, experiential learning opportunities and student-led initiatives aligned with UNSDGs enable students to actively participate in sustainability efforts, thereby fostering a sense of ownership and commitment towards the environment and society. Under the "School Management & Operations" pillar, GSF focuses on implementing school-wide practices aimed at reducing energy and water consumption, minimizing waste production, and calculating and reducing the carbon footprint. This pillar also highlights the importance of constructing green and sustainable buildings, utilizing resource-efficient technologies, and greening the landscape to create a truly sustainable campus. The fourth pillar, "Skill Development," recognizes the significance of equipping both students and staff with the necessary tools to make informed decisions, think critically and creatively, and collaborate effectively. We conduct regular trainings and workshops along with leadership lectures and seminars. The final pillar, "Stakeholder Connect," emphasizes the importance of engaging all stakeholders, including students, staff, parents, and the community, in sustainability efforts. Through awareness campaigns, community activities, and feedback mechanisms and reporting GSF schools foster a sense of shared responsibility and promote a collaborative approach to sustainability.

To ensure the effectiveness of the programme, we have implemented a robust monitoring and evaluation system. Key Performance Indicators (KPIs) have been established for each pillar, and they are assessed on a quarterly basis. This process provides valuable insights into the implementation and impact of sustainability measures, allowing for continuous improvement and refinement of the programme. The success of the "5S of Sustainability" in our schools positions it as a replicable model for educational institutions worldwide. Its adaptability, scalability, and flexibility make it highly beneficial for other schools seeking to foster environmental consciousness, social responsibility, and sustainable practices. By adopting this framework, educational institutions can play a pivotal role in nurturing a new generation of environmentally aware and socially responsible global citizens who are equipped to tackle the pressing challenges of the 21st century.

Abstract ID-48:

COMPARATIVE ANALYSIS OF FOREST FIRE FREQUENCIES IN DIFFERENT FOREST DIVISIONS OF MADHYA PRADESH USING REMOTE SENSING DATA

Vibha Sahu' & Dr. Omprakash D Madguni'

E-mail: sahu.vibha3@gmail.com

1Indian Institute of Forest Management, Bhopal

Forest fires have significant ecological implications, affecting biodiversity, carbon cycles, and the livelihood of forest-dependent communities. This global threat is also evident in India, where Madhya Pradesh reported a staggering 47,795 forest fire incidents in 2021. In response to this alarming situation, this study aims to assess and compare forest fire frequencies across three distinct forest divisions (Khandwa, North Betul, and East Mandla) in Madhya Pradesh, India. To achieve this objective, fire frequency maps were generated using Landsat 5, 7, and 8 satellite images from 2010 to 2021, offering a comprehensive understanding of fire occurrence over time. The frequency was validated with FSI fire points. The study area was categorised into three fire frequency classes

(low, medium, and high fire) based on the reoccurrence of fire events. Employing remote sensing and Geographic Information System (GIS) techniques, the satellite data was meticulously processed and analysed, enabling precise identification and mapping of fire-affected areas.

The results unveiled notable variations in forest fire frequencies among the three divisions (Khandwa, North Betul, and East Mandla) in Madhya Pradesh. The low frequency is class predominantly covered regions with minimal or sporadic fire occurrences (0-3 fire incidences), the medium fire frequency class exhibited a moderate numbers of fire events (3-6 fire incidences). Conversely, the high fire frequency class identified regions with frequent and intense fire incidents (above then 6-time fire incidences). The area was calculated in hectare for each forest division.

The comparative analysis of these three forest divisions enhances our comprehension of regional fire dynamics and plays a vital role in devising tailored fire prevention and mitigation strategies. These strategic efforts are crucial for safeguarding biodiversity, maintaining carbon cycles, and protecting the well-being of forest-dependent communities from the adverse impacts of forest fires.

Keywords: Forest Fire; Fire Frequency; GIS; FSI (Forest Survey of India); Satellite images.

Abstract ID-49:

EVOLUTIONS OF AIR POLLUTION LAWS IN INDIA AFTER 1947

Dr Arun Kumar Yadav

Mobius Foundation, Delhi, Email: akumar@mobiustf.org

Air pollution is a silent killer, claiming more than seven million lives each year worldwide due to noxious ambient air quality. This pervasive issue ranges from the visible smog shrouding urban areas to the imperceptible smoke permeating homes, posing a substantial threat to both ecological health and the global climate. As per World Health Organization (WHO) 2015, India is the home of 21 world's 30 most polluted cities, exacerbating the severity of this crisis. According to Lancet Planetary Health 2019, revealed that at least 12.5% of deaths in India could be attributed to significantly elevated rates of lower respiratory infections, heart ailment, diabetes, lung cancer, etc., all stemming from severe air pollution in a certain percentage of cases. The root causes of India's acute air pollution in recent decades can be attributed to rapid population growth, industrialization, an increasing number of vehicles, and haphazard urban development, among other factors."

The presented review aims to comprehensively examine various aspects of air pollution laws and the legislative measures for its control in India. It emphasizes the historical context, and international treaties, as well as identifying gaps and shortcomings in air pollution control. This review study provides an analysis of the legislative controls implemented, and it includes an assessment of significant judicial responses to landmark cases related to air pollution. The review also sheds light on the challenges related to enforcing mechanisms that are crucial for the effective implementation of environmental laws aimed at reducing air pollution.

As a democratic nation, the Republic of India holds the distinction of being the first country to introduce an amendment to its constitution explicitly authorizing the state to protect and improve the environment, with a specific

focus on safeguarding public health, forests, and wildlife. In the past, certain constitutional articles like 39, 47, 48, and 49 indirectly addressed the subject of environmental pollution and protection. In response to the Stockholm International Conference 1972, on Human Environment, India adopted the 42nd constitutional amendment in 1976 to introduce new provisions, like the Directive Principle of State Policy (Article 48-A) and Fundamental Duties (Article 51-Ag), explicitly expressing the nation's commitment to protect and improve the whole environment and biodiversity. Through subsequent judicial interpretations, the right to clean air has been recognized as an integral component of the right to life (Article 21) guaranteed under the Indian constitution. This development underscores the growing recognition of the significance of clean air in safeguarding the fundamental rights and well-being of the citizens of India. With the aim of tackling the growing problem of air pollution in pan India, 136 non-attainment cities were covered under National Clean Air Program (NCAP), which was launched in January 2019.

In conclusion, India's journey in air act formation and development since the air act of 1981 has been marked by notable advancements, continued efforts, and robust policy measures that are necessary to ensure clean air for its citizens and the coming generations to come.

Abstract ID-50:

ASSESSMENT OF FOREST PHENOLOGY AND ITS RESPONSE TO CLIMATIC VARIABLES USING TIMESAT ALGORITHM

Jwalpa Tyagi, GIS Centre, Forest Research Institute, Dehradun 248006, Uttarakhand, India, Email: Jwalpafri@gmail.com

Phenology, the study of periodic biological phenomena is an important indicator of vegetation dynamics as it provides a critical signal of climate variability and change effects on plants. In terrestrial ecosystems, vegetation dynamics and phenology are crucial indicators of vegetation-climate interactions, variability in annual vegetation productivity, and changes in land use and land cover. The study was carried out in entire Uttarakhand consisting of the tropical and temperate forest ecosystems which are the main part of terrestrial ecosystem in this region and play an important role in global carbon balance. Earth Observation data from satellite missions can certainly support analysis of climate change effects on vegetation, making it possible to improve land management in space and time. Within this context, this work aims at extracting the phenological metrics and investigating their variability in different forest type groups and also to examine the relationship between climatic variables and phenology metrics. The time series data (2002-2021) of different forest type groups were extracted using Moderate Resolution Imaging Spectroradiometer (MODIS) - Normalized Difference Vegetation Index (NDVI) from Google Earth Engine (GEE) and the climatic dataset was extracted using spatial resolution daily gridded observational datasets for rainfall and temperature based on Indian Meteorological Department (IMD) information. An enhanced TIMESAT algorithm was used for retrieving vegetation phenology metrics from 250 m MODIS NDVI over Uttarakhand and statistical model was used to establish the relation between these metrics and climatic variables. According to the findings of the study, MODIS data can

effectively capture the phenological metrics of various forest type groups. The major phenology metrics to distinguish the forest type groups in the study area were determined to be length of season (LOS) and start of season (SOS), and the temperature has a stronger influence on LOS and SOS as compared to rainfall. The extent to which forests are affected by changes in temperature and rainfall, their intrinsic adaptation capacity, will ultimately determine the potential for sustained ecological stability and food security.

Keywords: Forest type groups, MODIS, Phenology metrics, NDVI, Climatic variables

Abstract ID-51:

QUANTIFYING THE IMPACT OF CLIMATIC FACTORS ON FOREST HEALTH IN THE INDIAN WESTERN HIMALAYAN REGION

Keshav Tyagi*, GIS center, Forest Research Institute (FRI), PO: New Forest, Dehradun 248006, India

*Email: keshavyagifri@gmail.com

In a terrestrial ecosystem, the climate is an essential component controlling forest growth and its distribution throughout the globe. Based on their characteristics, each forest type responds to changes in climate differently. Understanding the effect of different climatic factors and identifying the key element is essential for anticipating the effect of climate change on forest processes. In this study, we have used forest net primary productivity (NPP) as an indicator of forest health and explored the impact of different climatic factors such as minimum temperature, maximum temperature, precipitation, actual evapotranspiration and vapor pressure on forest health. For quantifying the impact of these climatic variables, a residual trend analysis approach was applied. During the assessment period, 2002-2022, the overall productivity of Indian Western Himalayan (IWH) exhibit considerable increment. The highest NPP was recorded in 2018 i.e. 6.198 tC/ha. Among different forest types present in the study region, Tropical moist deciduous with 1.35 tC/ha/yr and Tropical dry deciduous forest with 2.71 tC/ha/yr is the only exception having NPP lesser than the region average during the assessment period. Quantifying the impact of different climatic factors on forest productivity, the results reflected that, each factor is having a positive impact on the overall NPP of IWH forest. The analysis also indicates that the NPP of the Indian western Himalayan forest is controlled by temperature (combined maximum and minimum) which is contributing 58.64 % to its gain. This control and contribution varies in different forest types. In tropical moist deciduous forests, precipitation is the maximum contributor to productivity whereas in Subtropical Dry Evergreen forest vapour pressure and soil moisture are the main controlling factors. The present study provides insights into how Himalayan vegetation responds to different climate factors. It also improves our understanding of productivity behavior in the last two decades and provides the scientific basis for region centric ecological construction.

Keywords: Productivity, Climate change, Trend analysis, Ecosystem, Forest type.

Abstract ID-52:

LAND AND WATER RESOURCES

MANAGEMENT STRATEGIES FOR ECONOMIC DEVELOPMENT OF KUMARI WATERSHED AREA IN WEST BENGAL, INDIA

Palash Naiya^{1*} & Ajit Kumar Bera²

1. Department of Education, JNP College of Education, Ashokenagar, North 24 Pgs 743222, West Bengal, India;
2. Post Graduate Department of Geography, University of Calcutta, 35, Ballygunge Circular Road, Kolkata 700019, West Bengal, India.

*Correspondence: palashnaiya2011@gmail.com

It is significant that land and water resources utilization policy and management strategies are recommended on the Kumari River Basin (KRB) area for sustainable agroforestry development with employment generation and economic development as well as rural environmental protection and reducing poverty level of the study area (1937.53 sq.km). The area (KRB) is under the Tropical Monsoon climate and undulating plateau surface where about 85.00 percent people depends on land resource and agriculture is the principal occupation and livelihood of the people. This paper has been emphasizing the potentiality of soil and land productivity, water availability with utilization system and future prospects within the Kumari Watershed area (KWA) which will be helpful to the local administration to setup the sustainable developmental planning processes. Finally, the watershed area is divided into four categories of land units that should be developed through land and water resources management strategies separately. After application of the management strategies in the watershed area (KWA), there grow more food, fodder, fish, fruits and vegetable crops for consumption of local inhabitants with agro product market development. This type of study and application is more helpful in the Kumari watershed area for future sustainable development through (I) short term (2-3 years) and (II) long term (5-7 years) planning.

Keywords: Watershed, Land and Water, Resource management, Employment generation, Sustainable Development.

Abstract ID-53:

ENHANCING CLIMATE RESILIENCE THROUGH URBAN GREEN SPACE RESTORATION: INSIGHTS FROM DELHI URBAN AGGLOMERATION

Manjari Upreti and Amit Kumar*

Department of Geoinformatics, Central University of Jharkhand, Ranchi -835205, India

*email amit.kumar@cuj.ac.in, 91-8603860814

Thematic Sessions: Role of Sustainability Education in amplifying Nature based Solutions for Climate Action
Urban areas have been experiencing the severe implications of climate change and unsustainable anthropogenic activities, leading to the development of complex challenges for ecological infrastructure and residents. Therefore, in the present study, we investigated the changing pattern of urban green cover spaces (UGSs) and land surface temperature trends with increased imperviousness in the Delhi Metropolis in the last two decades using multi-temporal

earth observation satellites. The diurnal land surface temperature (LST) variability of the summer season using MODIS datasets exhibited a considerable rise in maximum daytime LST anomaly (2.5 to 3 °C) during 2013, with an increased episodic rise and fall in maximum daytime LST as compared to previous periods (2005-06, 2010, 2019-2020) and exacerbated the impact of heat stress. In contrast, the nights in the Delhi urban region have been getting warmer (2.0 to 2.5 °C) in recent decades (2013-2020) as shown by the maximum nighttime LST anomaly analysis. These alterations in land surface temperature are linked with the large-scale land transformation in the urban region and its vicinity, which has contributed to the green cover decline (by 17.73 km²; 13.4% change) and rise in impervious surfaces (by 339.2 km²; 186.1% growth) during 1973-2014. Per capita UGSs analysis at the zonal level (directional quadrants to CBD proximity) identified the hotspot zones of UGS loss (<9 m²/person as per WHO, 2010) primarily observed in the south-west, northwest-west, northeast-east, and north-northwest parts of Delhi during 1973-2014. However, the later period observed UGS recovery (by 176.5 km²; 154.4% growth) with a significant increase in per capita UGS (256.5%) during 2014-2020 as a result of effective implementation of the Green Action Plan, green-belt development, plantation drives, etc. Moreover, the implications of such solutions are not insufficient due to large-scale alterations in regional land use/ cover, urban climate, high population density, and accelerated usage of carbon-intensive technologies. The measures pertaining to green roofing, the development of greenways, encouraging sustainable mobility, etc. are successful approaches for the restoration and rejuvenation of urban ecological quality that can contribute to making cities safe, inclusive, and resilient. The study highlights the hotspot zones of land surface temperature and green space deprivation zones and necessitates the urgent adoption of nature-based solutions (NBSs) for green space development and controlling the rising impact of land surface in view of exacerbating climate extremities in urban areas.

Keywords: Urban green spaces, Land surface temperature, Nature-based solutions, SDGs.

Abstract ID-54:

ASSESSING AND OPTIMIZING ANSWER BOOKLET PAGE IN EXAMS: A SUSTAINABLE APPROACH TO REDUCE CARBON FOOTPRINT IN EDUCATIONAL INSTITUTIONS

¹Sachin A Rosario, ²Hariraam S, ³Akshata G Athreya

1: Assistant Professor, Dept. of Environmental Science, Surana College Peenya, Bengaluru

2: MSc.Student, Dept. of Environmental Science, St. Joseph's University

3: Assistant Professor, Dept. of Microbiology, M S Ramaiah College of Arts Science and Commerce, Bengaluru

The escalating global environmental crisis, highlighted significantly by the rampant deforestation, demands immediate and comprehensive action. Among the manifold responses to this crisis, one surprisingly simple yet impactful method involves the reduction of paper usage in academic settings, particularly through limiting the number of pages in exam answer booklets. In countless academic institutions around the globe, students are required to utilize answer booklets, typically containing more pages than necessary to circumvent the potential issue of loose sheets. Such

practices contribute to the ever-growing demand for paper, which in turn accelerates deforestation. This scenario puts our environment in a precarious position, considering that trees play a crucial role in maintaining the planet's ecological balance, sequestering carbon, and mitigating climate change. For instance, according to the Rainforest Foundation, a single tree can absorb as much as 48 pounds of carbon dioxide per year. Thus, when we extrapolate the numbers, the scale of potential positive environmental impact becomes evident. By strategically reducing the number of pages in answer booklets, we can significantly cut back on paper usage. This reduction can be achieved through several pragmatic strategies such as employing smaller font sizes, narrowing the margins, utilizing ruled pages, and encouraging students to write in a concise manner. Despite the call for responsible paper usage in exams, there's a prevalent trend to include superfluous pages in booklets for perceived convenience. In light of this, we conducted a study, to count the number of sheets used for answer writing in final exam. We evaluated close to 50,000 answer scripts across 37 different courses from 9 major streams. Each booklet comprised 16 pages, equivalent to 8 sheets. The study revelation was compelling. Students often used less than half of the booklet, suggesting that reducing the current booklet size by half could save approximately one tree for every 8,000 sheets conserved. This seemingly modest adjustment could lead to saving about 15 trees annually, thus decreasing the carbon footprint and simultaneously alleviating the financial burden on the institution. This resonates with the concept of sustainability, reminding us that small changes can bring about substantial results.

Key Words: Sustainability, Carbon foot print, Answer booklet

Abstract ID-55:

EVERYDAY ENVIRONMENTALISM, A CASE FOR AN EXPERIENTIAL ENVIRONMENTAL CURRICULUM FOR CLIMATE ACTION

Utsow Pradhan, Email: upasnac@tieedi.in
Tieedi Permaculture Foundation, West Bengal

With ever growing landfills, polluted air, rivers and mountains, citizens across our cities, towns and villages urgently need to take a collective effort towards collate action. Awareness coupled with behavior change is pivotal in achieving our global sustainable development goals in climate.

To raise awareness and shift behaviors it is important we begin educating and equipping our current and future generations on how to take collective action in improving our climate resilience. An experiential curriculum allows for learners and educators to engage in an interactive "learning by doing" methodology that bridges the gap between knowledge and action. In line with this approach we developed an experiential environmental curriculum to address the contextual yet multitude of challenges faced by individuals today. The curriculum includes awareness and interactive sessions across:

1. Holistic waste management.
2. Natural Living and Zero Waste Lifestyle
3. Water Management
4. Sustainable Fashion
5. Sustainable menstruation
6. Natural Building
7. Gardening

This curriculum is currently being piloted across 7 Schools across himalayan hill communities in Darjeeling, India. The focus of this program has been to bring awareness amongst learners and staff (educators and non-educators) on the abovementioned modules, through which each school is enabled to develop a Materials Recovery Facility and Composting Unit and through the course of the program of one-year the school becomes self-sufficient towards learning and leading a Zero-Waste journey. Through our initial progress we have seen an increased understanding and care for nature, regular voluntary participation in segregation and clean up drives amongst the learners.

The curriculum, while designed for the current context of the himalayan hill communities it serves, can be replicated in contexts across the country. Initial case studies are highlighting bright spots of students who are developing their own alternative sustainable products and schools fully adopting and converting to adopting a Zero-Waste way of living.

Abstract ID-56:

ESTABLISHING SPATIAL RELATION BETWEEN TOPO-CLIMATIC VARIABLES AND FORESTS OF INDIAN WESTERN HIMALAYAS

Harshi Jain, GIS Centre, Forest Research Institute (FRI) P.O. New Forest- Dehradun India, Email: hjharshijain@gmail.com

Climate influences the distribution of vegetation determining its composition, structure and type in a region. Climate change such as increasing temperature and altered precipitation patterns could result in regime shift of forests in terms of forest type, canopy cover or tree line shift. Understanding the dynamics of the climatic conditions governing the distribution of forests in the present times is of fundamental importance to comprehend the potential changes in vegetation under projected climatic scenarios. The present study investigates the application of earth observation data to understand the role of climatic variables in the distribution of forests in the state of Uttarakhand. A regression-based framework was applied to develop relation between forest and topo-climatic parameters using remotely sensed data from Sentinel-2, ERA5 and Shuttle Radar Topography Mission (SRTM) Digital Elevation Model (DEM). Contribution of the topo-climatic factors in the vegetation distribution were identified and optimum bounds of the variables such as temperature range, precipitation range, slope, elevation conducive for the existence of the present-day forests were determined. Concomitantly, we have explored the efficacy of Google Earth Engine (GEE), a state-of-the-art cloud-based platform, for geospatial analysis. The study paves the way for integrating climatology in geospatial environment to provide insights into the influence of climatic factors on forest type distribution. The present approach can prove to be a useful tool for undertaking climate change studies to identify future challenges in the forest ecosystem and planning necessary climate action.

Keywords: Remote Sensing, Tropical Temperate forests, Regression analysis, Forest type, Google Earth Engine

Abstract ID-57:

THE SPECTRUM OF GENDER JUSTICE IN

SUSTAINABILITY EDUCATION FOR CLIMATE JUSTICE

Vani Bhardwaj, PhD Scholar, IIT Guwahati, bhardwajvani95@gmail.com

Nearly 38 million children undergo disrupted education due to climate change-related disasters annually (Sims, 2021). Dalit girls bear double the burden of climate change reflective in school dropouts and discontinued education as they are enmeshed in agriculture slavery, human trafficking and informal sector employment (Bhardwaj, 2022). Women and adolescent girls are essential for locating solutions for climate justice (Hassani, 2022). Educating about reproductive health in times of climate crises therefore becomes inevitable since PCOS, pollution via microplastics, water pollution (metals), cosmetic industry, air pollution hold impasses for reproductive justice for young and adult females as well as trans women. We need to locate critical menstruation studies (Bobel, Winkler et al. 2019) in sustainability education. Thereby, Comprehensive Sexuality Education (CSE) (WHO, 2021) must be disseminated across the education system.

The paper adopts a continuum-based approach from teenage to womanhood (cycle). The methodology adopted herein requires transdisciplinary crossover from critical menstruation studies and reproductive health justice templates. The paper discovers the intersection of vulnerabilities such as homelessness and disaster-led destruction that aggravate menstruation and reproductive justice-related issues for adolescent girls, young women and trans women.

The paper concludes that we can learn from the communities of practice rather than preaching sustainability to them. Learning with them, narrative accounts for caste-based period poverty in adolescent Dalit girls, lived experiences for physically disabled girls, CSE training materials for hearing impaired and blind girls. CSE is an awareness for the Prevention of Gender-Based Violence exacerbated by climate change-related injustices. Nonetheless, it remains a challenge to implement in the Majority World as CSE remains taboo and stigmatized in 'developing' countries. Sustainability education therefore encompasses gender sensitive curriculum and upholds gender justice is climate justice.

Abstract ID-58:

HEALTH EQUITY: A FAR-FETCHED REALITY OF INDIAN WOMEN

Dr. Kamalika Banerjee, Assistant Professor, Department: Political Science, South Calcutta Girls' College, 72, Sarat Bose Road, Kolkata- 700025, West Bengal, India
Email id: kamalikabanerjee0707@gmail.com, 8017171251

"Health is a human right, not a privilege to be purchased". According to the definition given by WHO, "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." This definition implies health is something larger than the mere physiological perspective. Health determines the status of a person in the social structure. Article 25 of the paramount document i.e. Universal Declaration of Human Rights recognized health and well-being as a component of the right to standard of living adequately. Later in the proclamations

like 1966 International Covenant on Economic, Social and Cultural Rights, Millenium Development Goals to Sustainable Development Goals the question of health as a basic right got prominent. It is an important determinant of global justice. The right to health should be attained by every individual irrespective of caste, class, gender, or religion. Health equity is the state in which everyone has a fair and just opportunity to attain their highest level of health. Article 21 of the Indian Constitution guarantees a fundamental right to life & personal liberty. The right to health is inherent to a life with dignity. A life with physical, mental, political, social and economic dignity makes the living meaningful. The good health of citizens leads to a prosperous nation. Enhancing womens' healthcare is a need of the hour in India. The issue of gender deprivation regarding health care justice in the subcontinent is a matter to be addressed and resolved. Not only a fair medical infrastructure but also a fair social structure is to be practiced. The changing climate already has hurt the most beautiful offspring of mother nature. For attaining sustainable developmental goals and promoting global justice, health equity should be the predominant action in the land of 662.90 million second sex.

Keywords: Health Equity, Fundamental Rights, Social Justice, Women, India, Sustainable Development Goals

Abstract ID-59:

IMPACT OF EDUCATION ON CONSUMER'S PURCHASE INTENTIONS TOWARDS THE SUSTAINABLE PRODUCTS

Aryan Soni, aryansoni2004@gmail.com
Symbiosis Centre of Management Studies

In this research, we will see the effect of age as a factor to determine the impact of consumers on the sustainable practices used by marketers. We are using the various products and marketing strategies companies use to sell the sustainable line of their existing product. It involves doing a survey which getting the data required for the research. The impact of education on the various sustainable practices used by companies and its effect on consumer buying decisions is a topic that has been gaining attention in recent years. Analysing education makes a difference in the purchase intention of the people about the sustainable products that the market has.

Abstract ID-60:

INTEGRATED APPROACH FOR CHARACTERIZING PHYSIOLOGICAL AND BIOCHEMICAL RESPONSES OF ROADSIDE PLANTATION FOR ADAPTING AND MITIGATING VEHICULAR POLLUTION IN DEHRADUN CITY

Apurva Malik* (Presenting author), **Hukum Singh****

*Forest Ecology and Climate Change Division, Forest Research Institute, Dehradun- 248006

E-mail: apurva.malik14@gmail.com, +91-8178038700;

**Plant Physiology Division, Forest Research Institute, Dehradun- 248006

E-mail: hukumsingh97@yahoo.com, +91- 9675306791

Automobiles are one of the most important sources of air pollution. Roadside plantations are known to be cleansers of the atmosphere as they absorb gaseous and particulate pollutants through their leaves. The significant increase in air pollution has led to the crucial need for roadside plantations in urban climate. Plants employ a variety of adaptation and mitigation mechanisms in response to changing climatic and environmental conditions. This study investigates the physiological and biochemical characterization of roadside plantation of *Syzygium cumini*, *Lagerstroemia speciosa* and *Ficus religiosa* in urban areas of capital city (Dehradun) of Uttarakhand. Integrated approach considering physiological, and biochemical mechanisms for evaluation of the adaptation and mitigation response to urban roadside air pollution was utilized. Functional behaviors in terms of the CO₂ assimilation rate, transpiration rate, stomatal conductance, water use efficiency (WUE), mesophyll efficiency and dust removal efficiency (DRE) were studied. Furthermore, biochemical parameters like ascorbic acid, total chlorophyll content, protein, total sugar, and heavy metals like copper and zinc were studied. The results revealed that urban roadside pollution significantly impacts the functional traits associated with adaptation and mitigation potential of roadside plantations compared to control site (FRI, where limited movements are permitted). The study revealed that *Lagerstroemia speciosa* outperformed *F. religiosa* and *S. cumini* in terms of adaptability and mitigation potential. Further, it is suggested that all the three species could be used to develop green belts so that air pollution impacts could be minimized.

Abstract ID-61:

IMPACT OF CLIMATE CHANGE ON PUBLIC HEALTH - CASE STUDY DELHI, INDIA

Pallavi Tiwari¹ & Prof. Dr. Mayank Mathur²

¹Research Scholar, Department of Urban Planning, School of Planning and Architecture, New Delhi

²Professor, Department of Physical Planning, School of Planning and Architecture, New Delhi

The intricate association between climate change and public health is increasingly acknowledged worldwide, and our research throws light on this critical relationship by examining Delhi, a rapidly developing urban center in India, as a case study. The study's goal is to investigate the complex effects of climate change on public health within the specific socioeconomic and geographic context of Delhi. Global health is gravely threatened by climate change, which makes environmental problems like air pollution, heat waves, and water scarcity worse. Delhi is especially at risk because of its growing population and ongoing environmental problems. By combining quantitative data analysis with qualitative interviewing, a mixed-methods approach has been used to assess the effects of climate change on public health in Delhi. Our preliminary results show that changing weather patterns and rising temperatures both affect more people's health. The study also discusses the effects of climate change on mental health, a subject that has received less attention. The study emphasizes the significance of multidisciplinary, systemic strategies that integrate public health, climate change adaptation, and mitigation efforts. It suggests that in order to support healthier, more resiliency communities in the face of the climate crisis, urban planning and infrastructure development need to take an integrated approach.

The urgency of comprehending and addressing the intricate effects of climate change on public health is revealed by this study, which broadens the conversation surrounding the relationship between climate and health. It offers a critical analysis of these effects in the context of Delhi, opening the door for additional study in comparable urban environments worldwide and influencing policy-making to ensure a healthier, more sustainable future.

Abstract ID-62:

DECIPHERING THE PEDAGOGICAL CONUNDRUM OF CLIMATE EDUCATION

Dr Kumaraswamy T R¹, Dr Chetan Singai², Dr B C Nagaraja³

¹Assistant Professor, School of Public Policy and Legal Studies, Chanakya University, Global Campus, No. 29, Haralur, Devanahalli Taluk, Near Bangalore International Airport, Bengaluru – 562110; kumara.s@chanakyauniversity.edu.in

²Associate Professor, School of Public Policy and Legal Studies, Chanakya University, Global Campus, No. 29, Haralur, Devanahalli Taluk, Near Bangalore International Airport, Bengaluru – 562110; chetan.s@chanakyauniversity.edu.in

³Professor, Department of Environmental Science, Bangalore University, Mysore Rd, Jnana Bharathi, Bengaluru, Karnataka 560056; nagenvi@gmail.com

India is one of the few countries where environmental education is compulsory in formal education. A focus on environmental education had its genesis in the National Policy on Education, 1992, enforced per the order of the Supreme Court. The current pedagogy of environmental education remains a silo, thus creating some extent of awareness. However, it has failed to prepare children and students for the coming challenges nor equip them to work towards solutions for climate change and sustainability, thus creating a gap between education for climate actions and sustainability. National Education Policy 2020, which recommends restructuring school and higher education curricula, has demanded addressing this gap which can be done by reimagining and redesigning environmental education, emphasising climate education and sustainability.

The study provides a comparative overview of today's curriculum and pedagogical practices in the school and higher education system. It also suggests changes for curriculum to be local specific as well as have global relevance. The study suggests a new pedagogical approach which moves from knowledge-based to wisdom-based education, knowledge-centred to holistic education, teaching traditional culture to create a new culture and time-limited education to lifelong integrated education.

This climate education pedagogy for different stages suggests the following outcomes to deliver the following qualities and attributes in the formal system of education

- K – 2nd (3 - 7 years) Foundational: Attitude; awareness
- 3rd – 5th (8 - 10 years) Preparatory: Attitude; basic knowledge
- 6th – 8th (11 – 13 years) Middle: Attitude; more advanced knowledge, skills
- 9th -12th (14 – 17 years) Secondary: Attitude; skills; participation
- 12th Grade Onwards (17+ years) Higher Education:

Attitude; skills; participation and solutions

In order to achieve the learning outcome, it also suggests following the following pedagogical approach.

- Stage 1: Activity-based, toy-based, storytelling – all involving environmental sensitivity
- Stage 2: Introduction to ecosystems in integration with other social and science concepts, as well as languages and mathematics, which provides a basic scientific understanding of the environment
- Stage 3: Introducing the interaction of the environment with development and society, highlighting the impacts of such interactions on human societies.
- Stage 4: Introduction to various skills required to respond to the environmental implications on society.
- Stage 5: Working with communities to develop possible climate change and sustainability solutions.

The study also recognises the critical role of climate education in Adult Education. It suggests that the pedagogical process is in workshop mode; with more field visits for better inculcation of relevant attitudes and values. In conclusion, this study emphasises the integration of climate education and sustainability as a cohesive continuum, employing an interdisciplinary approach to foster the comprehensive development of students, empowering them to take meaningful climate action.

Abstract ID-63:

EXPLORING THE INTERPLAY BETWEEN CLIMATE CHANGE RISK APPRAISAL, PSYCHO-SOCIAL ADAPTIVE CAPACITY, PRO-CLIMATE ACTION, AND MINDFULNESS: A STUDY IN THE MOUNTAIN REGIONS OF HIMACHAL PRADESH, INDIA

Shalini Dagur, Research Scholar, Indian institute of forest Management, Email: shalinidagur8@gmail.com

Collective efforts and individual behavioral shifts are urgently needed to address the climate change crisis. Early identification of climate risks enables the development of effective adaptive strategies and proactive climate action. This study explores the relationship between climate change risk appraisal, psycho-social adaptive capacity, and pro-climate action, with mindfulness as a mediating variable. Data was collected from 900 youth respondents (aged 18-28) in Himachal Pradesh State of India, using judgmental sampling technique. A survey-based research methodology combining qualitative and quantitative data was employed. Results indicate a positive correlation between adaptive capacity and risk appraisal, suggesting that higher risk appraisal enhances adaptive capacity. Mindfulness positively correlates with social and psychological adaptive capacity, indicating that higher mindfulness improves adaptive abilities. Mindfulness was identified as a mediator, suggesting that risk appraisal influences social and behavioral adaptive capacities through mindfulness. Further, full mediation was observed among Psychological adaptive capacity and Climate Risk Appraisal with Mindfulness as the mediating variable. Subjective evaluations of climate change risks significantly impact individuals' mindfulness, affecting their social and behavioral adaptive capacities. The integration of Eastern contemplative practices is recommended as a valuable approach for climate change adaptation. This study contributes to understanding the complex dynamics

between climate change risk appraisal, adaptive capacity, pro-climate action, and mindfulness. It provides insights for enhancing individual and collective responses to climate change challenges.

Keywords- Climate Change Risk Appraisal, Behavioural Adaptive Capacity, Pro-Climate Action, Mindfulness

Abstract ID-64:

INTERNET GAMING DISORDER AND ITS IMPACT ON THE ENVIRONMENT

Mr. Saleen Pushpraj, Principal, Bharat Mata School, Bilaspur, C.G, Email: frsaleen@gmail.com

With the development of technology, means of entrainment are continuously developing. Online gaming is prevalent among many peoples. Online gaming addiction is defined as a person's continued and frequent usage of the internet to play games, which significantly impairs or distresses their lives. It is increasing day by day which is a concern for parents, doctors, social workers, and researchers According to media sources, online gaming addiction is more severe due to children and young adults having increased access to online devices which is a result of digitalization and access to the internet. In order to restore psychosocial well-being, internet gaming disorder (IGD) has been considered as pathology that co-occurs with poor self-regulation. This is because of the Digital Revolution, which caused online gaming addiction as well as loss of time and financial costs. Video games and social behaviour are related. Playing violent video games makes people more aggressive and less social. The 11th revision of the International Classification of Diseases includes gaming disorder (GD). The environmental impact of a mental health disorder like IGD would likely be indirect and related to factors such as energy consumption, electronic waste, and resource usage associated with excessive gaming.

Keywords: - Internet gaming disorder (IGD), Digital Revolution, Online Gaming, Environment, Social Network.

Abstract ID-66:

MISSION CAPTAIN COOL

Satyam Jha

Co- Authers: Sourya Kashya, Himangi Halder

(Students) Bharat Mata Em Hs School Bilaspur Chhattisgarh

Intending to spread awareness among school students, eco-club students, every citizen of the state and our beloved nation, team Nature Bodies Eco Club has developed 'CAPTAIN COOL APP'.

With this app, an individual can easily calculate the amount of carbon he/she emits because of his/her daily life activities. Be it watching TV, charging devices, using washing machine etc. This app is designed so that one can easily calculate the annual carbon emission by selecting the appliance at home from the checklist provided and giving input of the power rating of the appliances and the number of hours he/she is using it daily. Now there is a chance that some people might not understand the severity of carbon emission in the environment. We have covered it with an additional feature and that's economic benefits.

So along with carbon emission, one can also calculate the

amount of money spent per year to use all the appliance in the home according to the hourly usage. Once the individual calculate and gains awareness of his/her carbon emission in the environment, he/she can move to the second segment of our app which is called 'Actions to Reduce Carbon Emissions.' In this segment, we have made a checklist of electrical appliances followed by input area of the number of hours and number of Days which the user wants to take action for reducing the carbon emission.

For standard, we have kept 40 watts as the desired capacity of all the electrical appliances which the user can change if he wishes. After giving all the input, our calculator will give the amount of carbon emission you can save from emitting in the environment.

The helpers that will help in reducing the carbon emission to a greater extent are the 'Green Hacks'. Green hacks are simple, easy and effective measures that one can take to reduce their carbon emissions. Switching from Bulb to CFLs, turning OFF appliances when not in use etc., are examples of green hacks. Our team members have made short videos showcasing all the green hacks, helping students and every citizen to adopt low carbon lifestyle. This way, with our Captain Cool App, we want every citizen of our Nation to calculate their carbon emissions to the environment and reduce them by adopting a low carbon lifestyle by incorporating Green Hacks in their daily life.

13 lakh students from 6750 eco clubs of Chhattisgarh used this app on 22nd April 2023 i.e., World Earth Day 2023, calculated their carbon emission, the amount of carbon emission they can save and took a pledge to reduce 19,316 kg of carbon emission from going into the environment by switching off electrical appliances from plug points for 2 hours.

So, with this app, we believe that if every inhabitant of this planet calculates his/her carbon emission and adopts a low carbon lifestyle, we can surely Restore Our Earth.

Abstract ID-67:

IMPACT OF *Neltuma juliflora* AND ECOLOGICAL RESTORATION ON MANAGED ECOSYSTEM OF KAMLA NEHRU RIDGE, DELHI, INDIA

Upma Garg¹, Gourav Bansal¹, Siddharth Kaushal², Faiyaz Khudsar³, A.K. Singh³, Harmeeek Singh³, Radhey Shyam Sharma¹

Upma Garg, Upmagarg567@gmail.com

1.Department of Environmental Studies, University of Delhi, India

2.Department of Botany, University of Delhi, India

3.Biodiversity Parks Program, CEMDE, University of Delhi

Kamla Nehru Ridge (KNR) is a part of Aravalli range in the National capital of India, falls under Northern Ridge and spreads over an area 85 hectares. North Ridge was declared a reserved forest in 1915. Being subjected to high weathering, topography of the ridge is undulated and has been divided into six phases due to laying of roads. Apart from the fragmentation, KNR is dominated by *Neltuma juliflora* and *Lantana camara*, both are invasive and alien species in India. The former was introduced by Britishers during

colonial period for increasing the green cover of the region which led to degradation and loss of biodiversity. Delhi Development Authority in joint collaboration with Centre for Environmental Management of Degraded Ecosystems (CEMDE), University of Delhi initiated ecological restoration of the area using Biodiversity Park model. Management of Neltuma juliflora involved canopy opening and cut rootstock methods to eradicate Lantana. The initiative for ecological restoration has been considered bringing assemblage of species in the form of historical native forest communities which included native trees, shrubs and grasses.

In the present study, vegetation analysis of Kamla Nehru Ridge was carried out across three phases and following random sampling method, soil samples were collected and subjected to various physical and chemical analysis like soil moisture, soil temperature, nitrate-nitrogen, phosphorus, total organic carbon, etc. The control plot for the study was the one where no ecological intervention was carried out. The results were studied in terms of impact of *N. juliflora* and ecological restoration interventions at KNR. The effect of ecological restoration on the presence and absence of the invasive species was considered. This formed three categories of plots- Control plot, plots with ecological restoration and absence of *N. juliflora*, plots with ecological restoration and presence of *N. juliflora*.

It was observed that control plot was devoid of any human intervention and ecological restoration but *N. juliflora* was present and had low values of chemical parameters as compared to the average values. For the plots where ecological restoration was carried out and *N. juliflora* was present, the values for chemical parameters were higher as compared to the control plots. However, the quadrats with ecological restoration and absence of *N. juliflora* showed best results including higher species diversity, tree density, tree species richness, shrubs density, phosphate and moisture as compared to both control and the plots with ecological restoration and the invasive plant. Hence, it was concluded that ecological restoration has had positive effects on the ecology of Kamla Nehru Ridge and could be used as a measure for restoring degraded ecosystems.

Abstract 1D-68:

IMPACT OF ECOLOGICAL IMBALANCE ON HUMAN HEALTH

Poonam Singh, Student, M.SC. Environmental Science
 Guided By: Mr. Panu Halder
 Place: Bilaspur, Chhattisgarh, India
 E-mail: singhspoonam3103@gmail.com

Ecological balance is very crucial for the smooth functioning of the ecosystem. Any alterations in the environment contribute in creating ecological imbalance in nature. The most threatening cause for this is human intervention. Human is the most intelligent creature, created by God on this earth. He has the ability to interfere in nature and change it for its welfare. But in the lapse of time, he started using his power to make changes for fulfilling his selfish needs without thinking about the contemporary creatures. As a result, many species got extinct and we are facing severe biodiversity loss, climate change, and global warming. It is not wrong now to say that man is paying for his deeds against nature. Now the environment has been disturbed so much that it is supporting the growth of harmful microorganisms and

wiping off the good living organisms. The impact of human intervention is also causing the degradation of vegetation as well. This is forcing people to depend on non-nutritious food. For this reason, now humans are becoming poorly immune and prone to diseases. The covid pandemic was an alert for us that we have disturbed the ecology so much that now we can't even imagine what kind of disaster we are going to suffer from very soon. People at very young ages also are under the clutches of diabetes, pressure, and heart disorders. So many new diseases are emerging now which we have not even heard so far and affecting human health severely. This is due to the poor immunity of people. The reason behind this is the presence of a contaminated environment, disturbed ecosystem, and imbalanced ecology. It is not so late, still, we can reverse these changes by developing a sensible attitude towards nature. Man needs now to understand that he can be healthy only when he keeps his environment healthy. The ecological balance and human health is related directly. Any harm to nature will harm humans and any healing to nature will heal humans. Now, it is the time to wake up and realize that we have beautiful nature to cherish with all other creatures not to harm it for our very own sake.

With every negative step towards nature, man is reducing his lifespan on this beautiful planet. We need to make efforts to reverse this havoc. Let us become a team and make efforts to make a sustainable environment, ecosystem, and ecology. Let's prove that we are indeed the most adorable creature of the Almighty.

Abstract ID-69:

GREEN BUSINESS LEADERS: EXAMINING THE VARIOUS ASPECTS OF SUSTAINABILITY EDUCATION IN MANAGEMENT CURRICULUM

Khyati Manchanda ^{a*} and Nidhi Bhatia ^{b*}

a. Department of Management Studies, Indian Institute of Technology Delhi, New Delhi, India; b. Department of Management Studies, Indian Institute of Technology Delhi, New Delhi, India

a*E-mail: Khyati.Manchanda@dms.iitd.ac.in

b*E-mail: Nidhi.Bhatia@dms.iitd.ac.in

The world receives future corporate leaders from management schools. A person's enrolment in a management programme is the tactical first step towards a fruitful corporate career. But should success just be measured in financial terms? Should the effects of the commercial decisions that these corporate leaders make on the environment and society be considered? Skills for making successful and efficient company decisions are sown in management curricula. But should we continue using the same curriculum year after year without taking into account how the world is changing?

Most academic research on sustainability education has focused on one of the following: launching a pilot project (Sulkowski et al., 2020); document analysis (Albert & Uhlig, 2022); practise reflection (Lee & Hales, 2022); or pro-sustainability orientation (Dasgupta and Pawar, 2021). The basics of management curriculum and how to approach it, the method to be followed through each phase, are still not fully addressed in the literature. The development of individuals into Green Business Leaders should receive priority.

The participants in the current study are drawn from a

variety of cohorts that represent the management curriculum and are used in an exploratory analysis. Subject facilitators, pupils, and support personnel make up cohorts. Interviews are conducted; they typically last 15 to 20 minutes. The theme analysis process makes use of interpretive coding. Philosophical knowledge, new hires, job market needs, a preference for sustainability skill sets, and management institution infrastructure are the themes identified.

The company is impacting the ecological, sociological, and economic resources of society. The business is obligated to return its portion in a fair and appropriate manner. Individuals manage business organisations, and they are responsible for making decisions on the exchange of resources. Therefore, the entire society would gain from a broad exploratory examination of new sustainability basics. Keywords: sustainability education, Master of Business Administration (MBA), subject facilitators, management students, support staff.

Abstract ID-70:

PLASTIC POLLUTION LINKED TO GLOBAL CLIMATE CHANGE: AN EMERGENCY CALL FOR THE PLANET

Simpal Kumar Suman^a, Natarajan Chandrasekaran^b

a. School of Bio Sciences & Technology (SBST), Vellore Institute of Technology, Vellore, Tamil Nadu, India, 632014; Email: simpal14997@gmail.com

b. Centre for Nanobiotechnology (CNBT), Vellore Institute of Technology, Vellore, Tamil Nadu, India, 632014; Email: nchandrasekaran@vit.ac.in

*Corresponding author's address: Prof. Natarajan Chandrasekaran, Ph.D., D.Sc.

E-mail: *nchandrasekaran@vit.ac.in / nchandra40@hotmail.com

Centre for Nanobiotechnology (CNBT), Pearl Research Park (PRP), Vellore Institute of Technology, Vellore, Tamil Nadu, India, 632014

No doubt, our planet is alarmed by global climate change, which affects the lithosphere, hydrosphere, atmosphere, and biosphere. The United Nations (UN) declared that the era of global warming has ended and the world has now entered a phase of global boiling. Globally, we are facing two of the most well-known potential problems: plastic pollution and global climate change. Because of overpopulation's impact, anthropogenic actions are accountable for these problems. Initially, these problems were addressed separately, but a recent investigation has shown signs of a link between them, leading to a new window of synergistic study. However, it is frequently not widely recognized or is a vague viewpoint among those involved that both plastic manufacturing and waste are contributors to climate change. Due to the synergistic impacts of both problems on terrestrial and aquatic life as well as the transformation of the natural quality of soil, water, and air, the current situation is exceedingly complex and requires comprehensive research. Another level of contemporary research on micro-/nanoplastics (MNPs) is already going on. Approximately, 4% of total greenhouse gas (GHG) emissions from plastic production, conversion, and plastic waste management. During the disposal of plastics by the incineration method, plastic waste produces hazardous chemicals and emits greenhouse gases into the environment. According to OECD policy highlights, 93% of the world's

plastic is still produced using fossil fuels, with 6% coming from recycled plastic and about 1% from biobased materials. Leakage of plastics from land to rivers, marines, and oceans has become a very challenging issue. Only 9% of plastics are recycled, 22% are mismanaged, 49% are landfilled, and 19% are incinerated globally. In the environment, plastic waste is found in the form of megaplastics, mesoplastics, macroplastics, microplastics, and nanoplastics. These forms of waste are generated from aging effects and weathering processes in various environments. These contaminants enter land and aquatic environments and accumulate unevenly. According to the predicted model, more than 1000 rivers contribute 80% of global plastic emissions into the oceans. The resulting effects, such as changed carbon cycling and disrupted microbial ecosystems, can influence climate-regulating processes. Throughout the life cycle of plastic waste, greenhouse gases (GHG) are released and posed significant carbon footprint. It is estimated that global life-cycle greenhouse gas (GHG) emissions from plastics are about 1.7 Gt CO₂ e yr⁻¹, which is significantly more than the GHG emissions from international aviation sector. Ocean plastics change oceanic mixing patterns and interfere with biological processes, which prevent the sequestration of carbon dioxide, increase ocean acidification, and accelerate climate change. Additionally, they affect marine ecosystems that are essential for controlling the global climate and result in higher ocean surface temperatures.

Plastic waste management, the discovery of nature-based solutions, including biobased plastics, secondary plastics markets, a circular economy approach, harmonized policy, social inclusion, and grass-roots communication, transitioning to renewable energy sources, and promoting sustainable practices could be potential steps. Synergistic efforts to mitigate plastic pollution with concurrent climate change imperatives are necessary for comprehensive solutions to this plastic polluted planet.

Abstract ID-71:

LEARNING GARDEN LIVING MUSEUM(LGLM): A CASE STUDY OF SUSTAINABILITY EDUCATION

Prof (Dr.) Seema Purohit, supurohit@gmail.com, IWSA and Professor Emeritus, BKBC

Coauthors: **Vijaya Chakravarty C**, vijaya.chakravarty@gmail.com, IWSA, **Dr. Rita Mukhopadhyaya**, rita45@gmail.com, IWSA, **Dr. Paramjit Anthappan**, paramjitanthappan@gmail.com, IWSA

'Plant Blindness', the inability to see or notice plants is becoming rampant. Insensitivity to flora is one of the major causes of neglect of plants leading to species extinction and loss of biodiversity. Both are detrimental and threaten the stability of the planet's ecosystems. Unless people recognize, respect, and acknowledge plants as cohabitants, they will not protect them.

To reinforce sustainability education in society, especially among children and youth, the Indian Women Scientists' Association [IWSA] initiated a Learning Garden Living Museum [LGLM]. The half-acre plot has been divided into several bio-geographical regions and ecosystems representing over 500 species, which include primitive plants, those that attract pollinators, are edible and medicinal as well as provide several other eco-services.

Installations made from waste relating to eco-restoration, mangrove ecosystems, butterfly life cycles, and desert ecosystems have been put up along with visual displays of native birds and butterflies. An arboretum of native and medicinal plants offers study material for researchers and students with scope for digital herbarium, surveys, and propagation.

Geotagged trees along with QR-coded labels offer self-guided tours aided by mobile APPs. Demo tools like 'soil moisture sensors' are placed for need-based watering cycles. A Tree Library, where children can read outdoors and have fun while learning, has been set up.

LGLM promotes awareness about the role of plants in human lives and provides educational and skill development programs for school, college, and interested citizens through field trips, workshops as well as internship and volunteering programs. Several initiatives in conservation, biodiversity, and sustainability are educating, enthusing as well as empowering individuals and communities. Resourcing kitchen wet waste and garden leaf litter to replenish topsoil has been very successful.

College Interns and volunteers have worked on plant-based textile and food dyes, bio-pesticides, bio-fertilizers, water management systems, and working towards a zero waste and energy-compliant campus. They have also created interesting child-friendly literature and models to spread sustainability education. Passing down a healthy planet to future generations is pointless unless the youngsters are trained and possess the knowledge and skill sets to preserve and nurture the planet. Our case study establishes that the garden is a 'Living Laboratory' for experiential as well as project-based, multi-disciplinary learning. Arts, humanities, science, and technology come together in the garden to promote sustainability education in a therapeutic setting.

Keywords: Experiential learning, laboratory, Learning Garden living museum, Multi-disciplinary, Plant blindness, Skill development, Sustainability education, Tree library

Abstract ID-72:

SUSTAINABLE EDUCATION FOR BEHAVIORAL TRANSFORMATION: CREATING PRO PLANET PEOPLE UNDER MISSION LIFE

Arpanpreet Kaur, Research Scholar, Department of South and Central Asian Studies, School of International Studies, Central university of Punjab, V.P.O.-Ghudda, Distt.-Bathinda, Pin Code-150401. Email-arpanpreet41@gmail.com

Sudheer Singh Verma, Assistant Professor, Department of South and Central Asian Studies, School of International Studies, Central university of Punjab, V.P.O.-Ghudda, Distt.-Bathinda, Pin Code-150401. Email-sudheers.verma@cup.edu.in

Climate change is the most complex challenge in present century with its dire impacts extending to every sphere of human activity. United Nations Environment Programme (UNEP) in its emission gap report has already confirmed that the state-led Nationally determined contributions (NDCs) under 2015 Paris agreement are insufficient to restrict the global warming below 1.5 or 2 degree celsius. To meet the existing policy-action Gap, Behavioral transformation for

sustainable lifestyle has emerged as the most efficient solution for climate action. Lifestyle for Change (Life) is an India-led movement aimed to nudge individuals and communities to practise Climate friendly lifestyle. Launched in 26th Conference of Parties under UNFCCC, LiFE recognises people practising sustainable lifestyle practices as Pro Planet People(P3). However, changing human behavior is the most challenging task as it comprises complex amalgamation of values, practices, attitude and social norms. Intangible and long-term benefits of climate action against present bias of human mind, Individual procrastination, notion of good lifestyle entrenched in unsustainable practises of overconsumption of resources are few examples.

To overcome these barriers, Promotion of sustainable education presents long-lasting as well as economically and socially efficient tool to influence individual and community behavior. India has rich legacy of cultural and traditional practices considering environment as integral part of human life. Environmental protection and preservation has always been a part of formal as well as informal channels of learning in India. This paper intends to analyse the significance of Sustainable education in enabling behavioral transformation for promoting climate friendly lifestyle practices in India. To provide a comprehensive analysis on impact of sustainable education on behavioral transformation, examples from both formal and informal methods of learning would be cited.

Keywords: Climate Change, Sustainable Education, Behavioral transformation, Mission LiFE.

Abstract ID-73:

ETHNOBOTANY: AN INTERDISCIPLINARY APPROACH TO CLIMATE CHANGE

Nishanth Sanjay Gurav, Czech University of Life Sciences Prague (CZU), Email: nishanthgurav64@gmail.com

The world today is experiencing the impacts of climate change on biodiversity. Climate change is one of the major reasons for biodiversity loss. Recent studies have shown that biodiversity conservation can be used as a strategy to mitigate climate change. It is also well-known that climate change is an interdisciplinary subject. Ethnobotany is a scientific study of the relationship between people and plants. For many years ethnobotany has been looked at as a subject that helps our understanding of the different uses of plants such as medicines, food, and other cultural purposes. In this study, we try to understand how the ethnobotany of Gond tribal communities in Chhattisgarh, India can be used as a tool for biodiversity conservation and thereby help in mitigating climate change. During the study, different methodologies such as participation observation, non-structured interviews, and focus group discussion were used to understand the traditional practices of the tribal communities in the study area. The preliminary results show that there are many folktales, folk songs, and other local expressions that are used as tools to remember the use of plants or their behavior. This study, therefore, paves the way for a new approach to understanding biodiversity conservation and awareness through the local perspective.

Keywords: Ethnobotany, climate change, biodiversity conservation

Abstract ID-74:

NAVIGATING CLIMATE CHANGE EDUCATION: POLICY, CHALLENGES, AND FORWARD-LOOKING STRATEGIES IN A DYNAMIC WORLD

Nishtha Madnani, Senior Consultant, Capgemini Technology Services India Limited, Email / Phone: Nishtha.madnani96@gmail.com, +91 9810092999

Climate change emerges as a critical threat in our contemporary era, casting substantial perils upon our planet. Its impact reverberates across all societies, with a particularly pronounced effect on the more vulnerable segments. The collective recognition of this challenge took shape during the 1990s UNCED conference, where nations committed to collaborate within a multifaceted framework encompassing legal, policy, and technological cooperation. Immediate actions predominantly revolved around swift interventions via legal and policy routes, coupled with advancements in technology and industry.

However, the urgency posed by climate change mandates a fundamental shift in our approach. It demands consistent engagement of diverse stakeholders, including the broader civil society, to address the fundamental origins of this crisis. While numerous national strategies for climate education are still evolving, a noticeable ‘gap’ exists between existing practices and the imperative for substantial approaches to robust climate education, as highlighted in nationally determined contributions. Educators can bridge this gap by assuming recognized roles in policymaking and decision-shaping, contributing as stakeholders in national climate endeavours.

The most effective strategy for tackling this persistent issue lies in prioritizing foundational environmental education and awareness. While eco-friendly initiatives have been in practice for a considerable duration, involving students from schools and colleges, more advanced practices are emerging worldwide. For instance, the UK is set to play a pivotal role in a new GCSE in Natural History, recently announced by the government’s Department for Education, aimed at enhancing young people’s understanding of our world. Similarly, India’s New Education Policy (NEP) 2020 emphasizes comprehensive education and specialized domain knowledge in various aspects of environment, resources, and technologies at the school level.

This paper undertakes an analysis of diverse global policies, extracting valuable insights, pinpointing issues, and challenges, and proposing a progressive path forward, contextualized within the backdrop of NEP 2020. Forward-looking education cannot remain static within an ever-evolving world. To equip forthcoming generations with essential knowledge and practical skills for safeguarding their surroundings, curricula must empower individuals to assume responsibility for the present and future, actively participating in societal transformations.

Keywords: Climate Change, Climate Education, Environmental awareness, NEP 2020, Global Policies

Abstract ID-75:

FOOD SECURITY - CLIMATE EDUCATION FOR SCHOOLS IS A NEED OF THE HOUR

Alexander Amirtham, GREENS Biodiversity Sanctuary, Thiruchirappalli, Tamil Nadu

As climate change makes food security vulnerable, the resilience of the indigenous food system will be the future hope of food security. This paper will deal with why and how we developed the food garden, how it changes the learning experience and our future plans to reach out to young people. In 2011, the global population was 7 billion. It is predicted to exceed 8.5 billion by 2030. Providing adequate nourishment for all of these people represents a massive challenge. Covid, political conflict, pests and disease and climate change all threaten our food security. But with increasing urbanisation young people are disconnected from the soil don’t know where their food is coming from. Agricultural wisdom is acquired over centuries, but traditional farming skills are being lost. Farmers discourage their children from taking up farming. Many traditional varieties are disappearing due to chemical farming, soil erosion and reduced soil fertility. Food growing is not routinely incorporated into mainstream curricula.

GREENS believes in “on-farm conservation”. GREENS has developed a unique food garden concept where we provide a live demonstration of the practice of organic farming with traditional varieties of paddy, millets and heirloom vegetables. Through the garden we can share the challenges we have experienced and stress the importance of soil conservation and well as conserving seeds which can be distributed to farmers to ensure on-farm conservation.

Abstract ID-76:

ROLE OF SUSTAINABLE FASHION INDUSTRY IN SUSTAINABLE FRAMEWORK TO COMBAT CLIMATE CHANGE

Suhani Chadha* and Divya Agarwal**

*BCH, 1st year. Jesus and Mary College

** Assistant Professor, B.A. Programme (Environmental Science) Jesus and Mary College

Each action of ours is driven by a purpose, a cause that seemingly is essential to be fulfilled. But we need to ensure that our actions don’t influence the lives of millions of those creatures sharing the planet with us. We need to, however, keep in mind that all our actions are performed in a way that helps in fulfilment of our purpose without causing any tensions in the normal course of life relating to all creatures of this planet, and we can still exist in a harmonious state, i.e. a Sustainable Way of Living. Sustainable Living deals with the way of living life that helps in fulfilling all our current requirements through the use of natural resources, and at the same time doesn’t compromise with the needs of future generations. Reduced Rational consumption of natural resources is what Sustainable Living aims at. The choice of items for your daily use needs to be judiciously done, so as to ensure that the goal of sustainable living is fulfilled. The changing world trends, in relation to the fashion industry and their use for creating a sustainable lifestyle, is what this paper puts emphasis on.

Abstract ID-77:

THE ROLE OF ENVIRONMENTAL EDUCATION IN PROMOTING CLIMATE

ACTION AND SUSTAINABLE PRACTICES: A COMPREHENSIVE REVIEW

Ruchi*¹, Kusum Choudhary²

*¹Ph.D. Scholar at NIT Patna, (Associate Professor, Galgotias University)

² Ph.D. Scholar at NIT Patna (Assistant Professor, Galgotias University)

E-mail: ruchi.arora@galgotiasuniversity.edu.in

kusum.choudhary@galgotiasuniversity.edu.in

Environmental education is critical in supporting climate action and sustainable practices among individuals and communities. The purpose of this thorough review is to assess the available literature on the impact and effectiveness of environmental education efforts in creating positive behavioural changes toward climate change mitigation and sustainability. This research examines various educational approaches, pedagogies, and techniques used to address climate-related concerns, based on a comprehensive examination of peer-reviewed publications, reports, and case studies.

Keywords: Environmental education, climate action, sustainability, climate change mitigation

Abstract ID-78:

A SCENARIO OF SUSTAINABILITY ISSUE IN HIGHER EDUCATION IN NEPAL

Uttam Sagar Shrestha, Associate Professor, Padmakanya Multiple Campus, Tribhuvan University Nepal.

E-mail: usashrestha@gmail.com

The sustainability issue has been a major theme of the academic discourse in the higher education since United Conference on Human Development 1972. It's a necessary issue, which can enhance socioeconomic, scientific technological improvement in the country. Keeping in view, the university curricula in Nepal has introduced sustainability issue in the 6th Five Plan Period in 1980. Subsequently the successive plan period also follow path of sustainability in the country's higher education curricula, produces human resource and employed them in academic and government offices after 1990's and 2000's decade. However, implementation of the curricula could not materialized in proper way as national and global plan envisaged achieving the SDG by the year 2030 due to various problems like upgrading curricula as per newly emerging issues and incorporation of curricula in other disciplines.

The main objective of the article is to understanding impart of sustainability issue in the university curricula for sustainable development. The methodology for the present study is based on data mining of the secondary sources.

Keywords: Sustainability, Education, Curricula, Plan period, SDG

Abstract ID-79:

FROM WHAT WE LEARN TO HOW WE LEARN IT: REFORMING ASSESSMENT TO DRIVE

AGENCY AND ACTION ON THE CLIMATE CRISIS

Bethany Davies, Research Fellow, Australian Council for Educational Research, Australia,
Email: bethany.davies@acer.org

The dominant focus of efforts in the education sector to address social and environmental justice has been through the redesign of curricula to meet facts-based learning needs. Far less attention has been given to appropriate assessment to develop action-oriented skills. In this paper, we argue that prevailing assessment approaches are failing to foster the functional skills and agency needed for action on the climate crisis. This is especially the case in resource-constrained and/or fragile contexts in low- and middle-income countries (LMICs), where a reliance on examinations to perform a screening function and heavy reliance on machine-readable multiple-choice questions drives learning based on factual recall.

The paper presents analysis from recent work by ACER on assessing transversal skills in LMICs, recognising the contexts, challenges and constraints of different settings. We also present practical worked examples of how to teach and measure these skills in classrooms with limited resources. In doing so, we argue that changes to pedagogy and assessment frameworks can drive the functional and transversal skills needed to tackle climate and environmental crises, including through situated learning, critical thinking, problem solving, and collaborative working.

We situate this analysis within emerging understanding from resilience-building of the role of education and learning in developing the agency of children and youth to act in the face of climate-induced crises. In doing so, we call for attention to the role of pedagogy and assessment in developing both instrumental-functional skills and the intrinsic-affective dimensions that underpin agency to act. More broadly, we call for skills-led approaches that localise the climate crisis in the contexts and priorities of LMICs, especially those related to building resilience to climate impacts and tackling the wider drivers of environmental crisis. In conclusion, we identify areas for further practical research to ensure education can drive climate action globally.

Abstract ID-80:

MULTIDISCIPLINARY LEARNING PLATFORMS TO PROMOTE THE FORMATION OF ESD COMMUNITIES OF PRACTICE; A TEACHER EDUCATION PERSPECTIVE

Hiroko Shibakawa, Ph.D, Assist. Professor at ESD Promotion Centre, Graduate School of Education, Okayama University, Email: hirokoshibakawa@okayama-u.ac.jp

There is an urgent need to develop "Agent of Change" who will be responsible for transforming education towards a sustainable society. How, then, can an environment be created in which educators can be nurtured while realising the transformative learning of ESD?

Japan is the country that proposed the Decade of Education for Sustainable Development at the UN Conference in Johannesburg in 2002. In Japan, environmental education

has flourished due to the pollution problems that occurred in various areas during the period of rapid economic growth from the 1930s, which is known worldwide, and the accumulation of these problems has led to ESD. Okayama City, in particular, has often been recognised as an advanced city for ESD because of its lifelong learning facilities called community centres, where people gather to address local issues, connect with each other and engage in mutual social learning. On the other hand, there are still many obstacles to overcome in terms of the essential cooperation with schools and the training of teachers to make this possible. In Japan, where teacher busyness has become a social problem, it is a challenge for teacher education institutions to create an environment where not only teacher training programmes but also in-service teachers can learn and grow by practicing ESD with the local community.

The focus of this case study is a network of 11 UNESCO schools in Okayama Prefecture. In Japan, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) has designated UNESCO Associated Schools (ASPnet) as centres for the promotion of ESD and is promoting their membership nationwide. One of the pillars of the 2014 World Conference is the “Student Forum.” High schools affiliated with ASPnet from all over Japan gathered to realise the Forum, and the Okayama Commitment was submitted, with high school students and university-student volunteers of Okayama playing a central role in supporting the success of the conference. The ASPnet High Schools in Okayama learned a lot from this process, and the teachers, who witnessed the great growth of their students, launched the network in 2015, hoping to continue this experience after the conference, develop mutual ESD practices, and help teachers grow as well. The author, a full-time faculty member of the ESD Promotion Centre at the Faculty of Education of a local national university, is the advisor of the network.

In this study, the network is seen as a platform to promote the formation of ESD Communities of Practice, and its potential and challenges are explored. The learning required for sustainability education is transformative learning, that is, “Learning to Transform Oneself and Society”, and the process of legitimate peripheral participation in a community of practice that engages in and promotes ESD with colleagues is, in other words, the same process of transformation, growth and learning of teachers themselves as ESD practitioners.

Abstract ID-81:

THE OCEAN WE NEED FOR THE FUTURE WE WANT - YOUTH EMPOWERMENT FOR CLIMATE, OCEAN ACTION AND SUSTAINABILITY

Iwona Gin, Nausicaá, Centre National de la Mer, Boulevard Sainte Beuve, 62200 Boulogne sur Mer, France, iwona.gin@nausicaa.fr

Guillaume Lheureux, Centre National de la Mer, Boulevard Sainte Beuve, 62200 Boulogne sur Mer, France, internationalrelations@nausicaa.fr

In order to strengthen young people’s support for the United Nations Sustainable Development Goals and the United Nations Decade of Ocean Science for Sustainable Development and improve their ocean literacy, Nausicaá and partner organisations (Youth Environment Europe, Seascope

Belgium, European Marine Science Educators Association, Intergovernmental Oceanographic Commission of UNESCO) have initiated the Youth Forum for the Ocean (Youth4Ocean Forum) on behalf of the European Commission. This Forum aims to support the projects of young people aged 16 to 30 who are committed to the ocean, and it has more than 300 members now.

In this context, the Forum initiated events that promote intergenerational links during the Climate Conference of Parties of the UNFCCC in Glasgow, United Kingdom, in 2021 and the United Nations Ocean Conference 2022 in Lisbon, Portugal, which was received enthusiastically by the youth and senior experts.

In order to respond to young people’s desire to engage and the feeling of eco-anxiety which affects an increasingly large number of them, it seems essential to involve the youth in the United Nations Decade of Ocean Science for Sustainable Development and the Ocean

Conference, scheduled in June 2025 in Nice, France. Their voice, their concerns and their projects should be heard and taken into account at the highest level.

This is why the youth networks and other organisations have partnered to organise, in 2024 and 2025, a worldwide transgenerational consultation led by young people, which will identify their major concerns and existing solutions as well as provide practical keys to respond to the environmental and societal challenges facing the youth. The objective is that young people and senior experts propose a modern awareness-raising tool based on the Passport of the Citizen of the Ocean, and present the consultation results during the United Nations Ocean Conference 2025, and become agents of change.

Keywords: Ocean Literacy, Climate Education, Youth

Abstract ID-82:

GLOBAL OVERPOPULATION AND CLIMATE CHANGE

Mr. David R T Richardson, Population Crisis
E-mail: enquiries@populationcrisis.org

The increase in emissions of carbon dioxide and global sea and atmospheric temperature is directly related to the increase in the global population. The age of the Anthropocene has arrived. Humans can now influence the climate.

If man is ever going to be able to live sustainably within this world it is high time that we should compute what is a sustainable level of population which also does not adversely affect the climate. Once this a sustainable level is computed for a particular country then it becomes possible for that country government to develop its own policies that might allow its population to reach its respective sustainable level. Although this idea might appear to be utopian it is, nevertheless, a sensible suggestion.

India’s Population has risen from 170 million in 1800 to more than 1.3 billion today. India’s success as the largest democratic country in the world which is able to feed itself is a miraculous achievement. But this all comes at a cost and, like many other countries on this planet, its population was

not planned, and in many ways bursting at the seams.

Population Crisis would like to point out the possible scenario for a sustainable population for India and to give some ideas as to how this could be best achieved. After, all this is not simply a problem that applied to India but is a global one. It is hence possible today to broadly compute an average amount of the earth's resources which is available to each person on this planet, a term called the biocapacity, as well as it is also broadly possible to compute the average consumption per person on the planet, a term called the ecological footprint.

If the earth's biocapacity and ecological footprint for the average global citizen is plotted, since scientific records were collected in 1962, then one can see that the lines crossed in the early 1970's when the world had a population a little over 3 billion. We could therefore, tentatively conclude, that it is highly likely that this earth would need to reduce its population by at least half if it is ever to nearly to attain a population level that is living sustainably of its resources & hence climatic stability.

Abstract ID-83:

A SMART AND SUSTAINABLE FRAMEWORK TO COMBAT CLIMATE CHANGE : A COMPREHENSIVE APPROACH OF ARTIFICIAL INTELLIGENCE AND HUMAN PSYCHOLOGY

Prerna Maheshwari ^{1*}, Manya Srivastava ^{2*} Divya Agarwal ^{3*}, Pavitra Bhardwaj ^{4*}

The core of this paper, which explores the difficulties of resource problems and climate change, is the delicate interplay between AI, human psychology, and sustainable development. As global challenges escalate, the convergence of these domains presents a unique opportunity to devise effective strategies that facilitate environmentally conscious behaviors and resilient communities. This paper explores the psychological dimensions underlying resource dilemmas and climate change, emphasizing cognition, decision-making processes, social dynamics, and the role of AI in driving sustainable development. By amalgamating insights from psychology with cutting-edge technological advancements, society can aspire to navigate the path towards ecological equilibrium and a sustainable future.

Keywords: Policy framework, AI-powered climate modeling and data analysis, Proactive adaptation, Resilient communities and psychological dimensions, Global Collaboration

Abstract ID-84:

THE ROLE OF FORESTS IN CLIMATE CHANGE MITIGATION: INSIGHTS FOR INDIA'S FUTURE

Satyam Verma¹, Ekta Purswani², Mohammed Latif Khan^{1,2*}

1Department of Environmental Sciences, Dr. Harisingh Gour Vishwavidyalaya (A Central University), Sagar, MP, India
2Department of Botany, Dr. Harisingh Gour Vishwavidyalaya (A Central University), Sagar, MP, India

*Email id: khanml69@gmail.com

Forests play a pivotal role in climate change mitigation, serving as crucial carbon sinks and biodiversity reservoirs. We present an in-depth exploration of the multifaceted contributions of forests in mitigating climate change, with a focus on India's future prospects. Drawing on scientific evidence and advanced analysis, we unravel the intricate mechanisms through which forests influence the global carbon cycle and elucidate the potential implications for India's sustainable development. As atmospheric concentrations of greenhouse gases soar to unprecedented levels, the Earth's climate system experiences profound disruptions, leading to extreme weather events, rising sea levels, and ecological disturbances. Forests act as natural carbon sequestration agents, absorbing and storing vast amounts of carbon dioxide from the atmosphere, thereby mitigating the enhanced greenhouse effect and its associated impacts. The unique characteristics of forests enable their significant carbon sequestration potential. Forests, as complex ecosystems, boast an intricate architecture of vegetation, soils, and microorganisms, each contributing to carbon dynamics in distinct ways. We examine the role of afforestation and reforestation in enhancing climate resilience. Afforestation, the establishment of forests in areas without previous tree cover, and reforestation, the restoration of deforested or degraded lands, holds promise in mitigating climate change impacts by expanding forest cover. Reforestation initiatives have the potential to revitalize degraded ecosystems, enhance biodiversity, and create green corridors, fostering connectivity among fragmented habitats. India's future prospects in climate change mitigation hinge on strategic forest conservation and management. The country's diverse forest types, ranging from tropical evergreen forests to arid woodlands, necessitate context-specific strategies. Finally, we address the crucial aspect of policy and governance in realizing the full potential of forests in climate change mitigation. India's policy framework must embrace science-based decision-making, stakeholder engagement, and innovative financing mechanisms to incentivize sustainable forest management. The integration of forests into nationally determined contributions (NDCs) and international climate agreements fosters coherence and accountability in global efforts to combat climate change. We underscore the criticality of forests in climate change mitigation and its relevance to India's future. By leveraging advanced scientific insights, policymakers and stakeholders can craft evidence-based strategies to maximize the contributions of forests in mitigating climate change impacts. Investing in sustainable forest conservation and management ensures a greener, more resilient India, harmonizing human well-being with ecological integrity.

Keywords: Forests, Climate Change Mitigation, Carbon Sequestration, Afforestation, Reforestation, Sustainable Forest Management, Policy and Governance, India's Future

Abstract ID-85:

FIVE-IN-ONE SMART AQUASAVER DEVICE

Lovepreet Singh¹, Navjot Kaur², Gurnoor Kaur³, Rajdeep Kaur⁴, Gurleen Kaur⁵

dhillonlovepreet287@gmail.com, navjotsidhu2818@gmail.com, gurnoorkaur90105@gmail.com, rajdeepk5533@gmail.com, gs210074@gmail.com

The Oxford School of Education, Bhagta bhai ka, Bathinda

It is safe to say that water is the reason behind earth being the only planet to support life. Our daily activities are incomplete without water. Whether we talk about getting up in the morning to brush or cooking our food, it is equally important. Friends, nowadays as we all know that the level of water is decreasing, so to save this precious water, all the people are making various efforts such as collecting rain water, using RO's waste water for plants etc. So, we also wanted to save this precious gift of Mother Nature with our initiative which will help to a great extent in saving the water level. Friends, you must have seen that 10 liters of water is stored in the flush tank and using it repeatedly consumes a lot of water. To reduce this consumption of water and to resolve this major issue here we have a great alternative. It is an arrangement in which two containers of 2 liter and 5 liter and 10 liter will be placed inside the flush tank. The waste water from the kitchen sinks, bathtubs, washbasins and laundry will be sent to the sewerage which will be stored in the storage tank and purified and reused in the flush tank. This idea will be of great benefit. Further, by using piezoelectric sensor we can also generate an electric power from the apparatus which can be used for other purposes like charging etc. Moreover, the filtered water can spitted into hydrogen and oxygen by the process known as electrolysis and the oxygen can be taken into use.

Keywords: IR module, Alum, water pumps, filters, piezoelectric sensors.

Abstract ID-86:

STUDY ON THE ROLE OF AWARENESS AND ETHICS RELATED TO ENVIRONMENT AND CLIMATE CHANGE MANAGEMENT IN THE CASE OF KIRKOS SUB-CITY, ADDIS ABABA, ETHIOPIA

Rajeev Pandey* & Tenaw Getaneh Asmare

*Department of Environment and Climate Change Management, College of Urban Development and Engineering, Ethiopian Civil Service University, Ethiopia
Email: drrpenvo8@gmail.com

The awareness and ethics about global environmental changes and perceptions of climate changes in our society is of major concern at local and global level. So, the present study work aims to determine the attitude, the level of awareness and ethics about the common environmental problems related to our daily life also concerning to the industrial activities related impacts on environment and climate change for the selected study area of Kirkos Sub-city, Addis Ababa at the key professional i.e. persons related to city administration, government environmental agency, NGOs, Health and Education departments, having an important role in environment and development. The study was conducted on the basis of qualitative and quantitative data. The results revealed that the attitude, perception and awareness of the society to environment and climate change related issues which may have a vulnerable impact on the surrounding environment at a larger level mainly due to their lack of ethics and consciousness related to nature.

Keywords: Awareness, Climate Change, Environment, Ethics, Kirkos Sub-city

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