



Registration before 15 December 2022

LAKE 2022: Conservation of Wetlands: Ecosystem-based Adaptation of Climate Change

[**THE 13TH BIENNIAL LAKE SYMPOSIUM**]

Date: **28-30th December 2022**

Venue: Auditorium, Ground Floor, New Biological Sciences Building [Near D Gate],
Indian Institute of Science, Bangalore 560012, Phone: +91 080-22933503/22933099
 Symposium Web: <http://wgbis.ces.iisc.ernet.in/energy>
 E Mail: energy.ces@iisc.ac.in; lake2022.iisc@gmail.com

Organised by

Energy and Wetlands Research Group [<http://wgbis.ces.iisc.ernet.in/energy>],
Centre for Ecological Sciences, Indian Institute of Science, Bangalore 560012

Centre For Environment Education, Bangalore	Energy & Urban Research Group, RCGSIDM, IIT-Kharagpur
Karnataka Environment Research Foundation Adamyia Chetana, Bangalore	Department of Civil Engg., S R University, Warangal
Bangalore Blaze Girls High School	Alva's Education Foundation (R) Moodbidri
BGS National Public School, Bangalore	Vagdevi Vilas Institutions, Bangalore
K.K. High School, Varthur, Bangalore	Vidyaniketan Public School, Ullal, Bangalore
	Vidyanjali Primary and High School

Supported by

ENVIS Division, The Ministry for Environment, Forests and Climate Change, Government of India



Lake 2022 - 13th Biennial Lake Symposium

Conservation of Wetlands: Ecosystem-based Adaptation of Climate change, 28th -30th December 2022

Introduction: A symposium focusing on lakes/wetlands, popularly known as “**Lake Symposium**” was initiated by the Energy & Wetlands Research Group at the Centre for Ecological Sciences, Indian Institute of Science, Bangalore in the year 1998. The theme was broadened in 2000 (Lake 2000) with wider participation of education institutions, Governmental and non-governmental organisations, etc. The basic idea of the symposium was to bring out the trends in ecosystem conservation, restoration and management, including the hydrological, bio-physical, people’s participation and the role of non-governmental, educational and governmental organizations and the future research needs. **Lake 2022** will be the 13th Biennial Lake Conference would focus on “Conservation of Wetlands: Ecosystem-based Adaptation of Climate Change”.

Wetlands constitute vital components of the regional hydrological cycle. They are highly productive, support exceptionally large biological diversity, and provide a wide range of ecosystem services such as food, fibre, waste assimilation, water purification, flood mitigation, erosion control, groundwater recharge, microclimate regulation, enhance the aesthetics of the landscape, and support many significant recreational, social and cultural activities, aside from being a part of our cultural heritage. Wetlands play an important role in mitigating climate change adaptation through capturing and storing carbon to reduce atmospheric greenhouse gases (GHG), and providing resilience to hazards such as flooding, storm surge and coastal inundation.

The theme of World Wetlands Day 2022 is “**Wetlands Action for People and Nature**”, highlighting the importance of actions ensuring that wetlands are conserved and sustainably used. This would demonstrate the vital role of wetlands for the future of humanity and specifically their relevance towards achieving the new Sustainable Development Goals. Lake 2022 conference would provide a unique opportunity to increase understanding of the role of ecosystems in sustaining the food, water and human livelihood with the challenges faced by these fragile ecosystems. The deliberation involving all stakeholders would help raise awareness about wetlands' importance and the need to preserve them.

The sustainable development goals have ecological, social and economic aspects for present and future generations with an equitable share of resources. Conservation of natural resources through sustainable ecosystem management and development is the key to our secured future. Sustainable development of a region requires a synoptic ecosystem approach that relates to the dynamics of natural variability and the effects of human interventions on key indicators of biodiversity and productivity. Formulating and implementing action plans that best conserve vital ecosystems require understanding issues, concerns and threats. This requires awareness of the ecosystem function, goods and services among decision-makers and the public at large. Collaborative planning between scientists, policymakers and community members is an essential element of ecosystem-based management. Approaches towards this direction include:

- Fostering participation of all stakeholders to ensure that individuals and organizations are provided an opportunity to participate in the ecosystem conservation activities.
- Recommending policies and actions that can be undertaken to restore, maintain or enhance aquatic and terrestrial resources.
- Recommending policies and action plan towards the conservation and sustainable management of fragile ecosystems such as Western Ghats – water tower and food bowl for peninsular India.
- Nature based solutions to mitigate climate change ranging from the restoration of habitats to water resource management, disaster risk reduction, and green infrastructure—to address societal problems. Nature-based solutions provide essential benefits and services to the community, such as reducing greenhouse gas emissions, securing safe water resources, clean air, and ensuring food security.

SCOPE

Lake 2022 Symposium focussing on Conservation of Wetlands: Ecosystem-based Adaptation of Climate Change (during 28-30th December 2022) provides a unique opportunity to increase understanding of the role of ecosystems in sustaining the food and water with the challenges faced by these fragile ecosystems. The forum would demonstrate the vital role of ecosystems for the future of humanity and specifically their relevance towards achieving the new Sustainable Development Goals.

Lake 2022 conference: Lake 2022 forum would deliberate on nature based solutions through protection, restoration, and sustainably managing ecosystems in ways that increase their resiliency and ability to address those societal challenges, while also safeguarding biodiversity and improving human wellbeing. Lake 2022 participants include all stakeholders (Researchers: 30%, School students and teachers: 20%, college and university students: 20%, NGO's, community representatives: 20%, government officials (local, state and centre): 10%

Lake 2022 would focus not only on updating the current knowledge of the scientific community but also would bring in awareness among students, teachers, practitioners and the public. This would provide a platform for interaction among researchers, policymakers, academics and NGOs and address the issues related to wetlands and biodiversity in an era of climate change. This would help develop a stronger network among experts and institutions to develop efficient strategies for conserving and managing fragile ecosystems. As a part of the conference, it has been decided to have theme-based lead lectures by eminent scholars, paper and poster presentations by researchers, school and college students.

OBJECTIVES

Focus of **Lake 2022** would be (i) assessment of the present status and conservation aspects of ecosystems (terrestrial, aquatic - wetlands, lakes, tanks, ponds, swamps, streams and rivers), (ii) presentation by researchers, practitioners, students of case studies focusing on biodiversity, ecology, present status, threats, conservation measures required, (iii) discussion of current initiatives of conservation and management, (iv) role of education institutions, non-governmental organisations, religious organisations, (v) discussion of people's livelihood and fundamental right towards equitable resource allocation through scientific assessment of ecosystem goods and services, (vi) presentation by students (schools and colleges) based on documentation focusing on wetlands – biodiversity, present status, ecology, conservation and protection needs, (vii) allocation of financial and human resources to conserve and protect ecologically fragile ecosystems, (viii) proposals by students and non-governmental organisations for conservation, protection, restoration and sustainable management of aquatic ecosystems, (ix) discussion on research gaps and activities to be initiated by researchers to evolve appropriate strategies towards conservation of ecosystems in Western Ghats, (x) application of advanced technologies – big data, artificial intelligence (AI), Machine Learning (ML) and Deep Learning techniques for monitoring and sustainable management of ecosystems, (xi) developing SDSS – spatial decision support system for planning and management of ecosystems, and (xii) developing strategies for conservation and sustainable management of aquatic ecosystems in Western Ghats to sustain water, food and human livelihood.

THEMES for Paper Presentation/ Poster in Lake 2022

Papers are invited on the following themes from researchers, faculty from universities, Research Scholars, planners, development managers, economists and social scientists, school (VIII-XIIth students) and college (UG and PG) students and teachers.

1. Ecosystems (wetlands, forests, grasslands, estuaries, etc.)- Structure and functions.
2. Climate change – adaptation and mitigation strategies
3. Nature based solutions to address changes in the climate
4. Application of Geoinformatics in Ecosystems Management - Land use, Land cover dynamics, fragmentation of ecosystems
5. Monitoring of ecosystems – Big Data (Remote Sensing Data), Artificial Intelligence (AI), Machine Learning (ML) and Deep Learning techniques
6. Ecosystem (terrestrial, aquatic – coastal, fresh water) Goods and services.
7. Biodiversity, Hydrology and Ecology of Western Ghats.
8. Aquatic Ecosystems - Food and water security, people's livelihood.
9. Wetlands and swamps: Restoration, Conservation and Management.
10. Carrying capacity of river basins in Western Ghats.
11. Natural capital accounting and Valuation of Ecosystem services.
12. Sacred Groves (*kans, devarakadu*) and Myristica Swamps.
13. Eco-Tourism in Western Ghats and Carbon sequestration.
14. Natural and Anthropogenic disasters.
15. Limnology, aquatic ecology, biodiversity and prospects of bio-monitoring.
16. Pollution –terrestrial and aquatic - Monitoring and Management, waste (solid / liquid) management, bioremediation.
17. Constructed wetlands, bioremediation, phytoremediation
18. Sustainable Agriculture and Organic farming.
19. Coastal ecosystems – Biodiversity, Ecology, Productivity and Livelihood aspects.
20. Prospects of Renewable Energy (solar, biofuel, bioenergy) and Energy Conservation.
21. Environmental Education and Sustainable Development.
22. Environment Ethics and Green Technology; and Environment Literacy.

SCHOOL AND COLLEGE STUDENTS' PARTICIPATION

Orientation (Lake 2022- Pre Conference workshops) are planned in the partner schools for training students and teachers. The session would involve lectures and hands-on sessions (environment monitoring – biotic and abiotic components of an ecosystem). Institutions organizing the pre-conference Lake 2022 workshops (Co-ordinated by Centre for Environment Education (CEE), Bangalore) are:

- Sri Arurovindo Public School, Ulsoor
- BGS National Public School, Hulimavu
- Bangalore Blaze, Nagarabavi
- Ideal International Techno School, Channagiri
- K. K. English School, Varthur
- Poornapramati School, Banashankari
- Vagdevi Vilas Group of Institutions, Bidadi, Martahalli, Varthur, Whitefield
- Vidyaniketan Public School, Ullal
- Vidyanjali Primary and High School, Gottigere

AWARDS: There are **three awards in the students and teachers' category**— High School (VIII, IX, X); College (PUC, UG, PG) and Teachers (school and college). Awards for the best paper presentation would include a Certificate and a Memento. The best posters would be similarly awarded.

Lake 2022 Symposium: Programme Details

Dates	Time	Session	Venue
28-12- 2022	9 – 10 30 AM	Inauguration of Lake 2022	Auditorium
	11-12 PM	Keynote address	
	12- 1 30 noon	Plenary Lectures (Invited) – 2 lectures of 30 min each	
	2 30- 4 pm	Technical Session 1 – Presentations by young Researchers	
	4 30 – 6 pm	Technical Session 2 – Presentations by senior Researchers	
		2 30- 6 pm	Johny Biosphere session – Interactive session with school students
29-12- 2022	9 – 10 30 AM	Technical sessions – 3, 4 and 5, Presentations by school students (urban)	Parallel sessions – lecture halls (3)
	11-12 PM	Technical sessions – 3, 4 and 5, Presentations by school students (rural)	
	12- 1 30 noon	Technical sessions – 6, 7 and 8, Presentations by college students	
	2 30- 4 pm	Technical sessions – 9, 10 and 11, Presentations by Research Scholars	
	4 30 – 6 pm	Technical sessions 12: Poster session – presentations and evaluations	
	7 to 8 30 pm	Cultural programme	
30-12-2022	9 -10 30 PM	Technical sessions – 13 and 14, Presentations by teachers (school and college), Faculty from Universities	Auditorium
	11- 1 30 PM	Technical Session 15: Plenary Lectures– Climate Change (invited)	
	2 30- 4 pm	Panel discussion – finalising recommendations of the Lake 2022 forum	
	4 30 – 5 30 pm	Cultural programme – by students	
	6 – 7 30 pm	Valedictory Programme – prize distribution, Finalising recommendations of Lake 2022	
31-12-2022	9-12 30 pm	Field Ecology – nearby ecosystems (lakes, forests)	

LAKE 2022 - Organising Committee:

T. V. Ramachandra, CES	Rejini Simpson, CEE, Bangalore
M.D. Subash Chandran, CES, IISc	Tejaswini Ananthkumar, Adama Chetana
Bharath Settur, CES, IISc, Bangalore	C. Rajasekara Murthy, Environment Canada
Bharath. H. Aithal, EURG, IIT Kharagpur	Vrijulal. M. V, CEE, Bangalore
Uttam Kumar, IIIT-Bangalore	Ananth Ashisar, Vrikshalaksha
M.A. Khan, K.K. High School, Bangalore	Vinay S, CES, IISc and S R University, Warangal
Harish K,Vagdevi Vilas Institutions, Bangalore	Sara Kunnath, Koshy Institute of Management Studies
Vijaikrishna R, Vidyaniketan Public School,	M. R. Pranesh and C J Jagadeesha, KERF, Bangalore
Vivek Alva, Alva's Education Foundation	Umashankar, Vidyanjali Primary and High School
Sreevidya, Bangalore Blaze Girls High School	Rajshree Nair, BGS National Public School
Uma Mohan, Auro Mirra International School	Col C.P. Muthanna, Kodagu Model Forest Trust

LAKE 2022 - Scientific Committee

T.V. Ramachandra, CES, IISc, Bangalore	G. R. Rao, Bangalore University (Central)
M.D. Subhash Chandran, CES, IISc, Bangalore	Chaturved Shet, IPS, Channagiri, & HRBSF, Bangalore
Asulabha K.S., CES, IISc, Bangalore	Sincy V., CES, IISc, Bangalore
Sudarshan Bhat, SDM College, Ujjire	S. N. Prasad, OSGEO (India), Hyderabad
Durga Madhab Mahapatra,	B. M. Kumaraswamy, Shimoga
Saranya. G., CES, IISc	Y. B. Ramakrishna, Bangalore
Bharath Setturu, CES, IISc	Chandan M. C, NIE, Mysore
Vinay S, S R University, Warangal	Alli Rani, K K English School, Varthur
Vrijulal M V, CEE Bangalore	Prasanna B M, CES, IISc
Gayatri Naik, CES	Ravishankar Mishra, CES, IISc & Mission-V Foundation

Call for papers

Call for Scientific Papers: Delegates interested in presenting papers as oral or poster need to submit the scientific paper as per the guidelines given below.

Guidelines for Paper Preparation: The full text paper (e-version preferably in a CD and one hard copy) formatted to A4 (210 mm x 297 mm) size, after having been scrutinized and accepted, will be printed as received, by offset process. Therefore, the text of the paper in English must confirm strictly to the following requirements and be free from errors.

Template as per: <http://wgbis.ces.iisc.ac.in/energy/lake2022/proceedings.html>

Top/bottom margin	25 mm (on first page 35 mm)
Left/right margin	25 mm (all pages)
Typing area	160 mm x 247 mm (including folio), single space single column
Total pages	8 -10 pages including figures, tables, photographs, references etc., if any.
Font type	Times New Roman/Arial
Title	14 point BOLD CAPITALS
Author's Name	12 point Bold Upper-Lower (Do not prefix name with/Ms./Dr./Prof.)
Affiliation (designation, organisation and place)	<i>11 point italics</i>
E Mail ID, Telephone number and Mobile	11 point
Organisation web URL	11 point
Main headings	10 point BOLD CAPITALS
Subheadings	10 point Bold Upper-Lower
Text	10 point normal
Print	Laser Print or letter quality

The paper title, name(s) of author(s), affiliation and address, center justified, should be typed in a space of 50 mm from the top margin on the first page. The paper should begin with a synopsis of not more than 200 words describing the aim(s) of the work, methods, results obtained and conclusions. Type the headings, subheadings and paragraphs aligned with the left-hand margin (Align Left). Text justified on both sides is preferred. Use double space between paragraphs, and between section headings/subheadings and paragraphs. Do not number paragraphs, but number section and sub-sectional headings except synopsis, in conformity with established convention. The manuscript should be prepared by using MS Word (suitable for Windows). Figures should be drawn in black Indian Ink on translucent paper or acetate material (Gateway Tissue) with lettering of appropriate size using stencils. The figures should be placed nearest to the first reference in the text. Photographs on glossy paper may be included, if necessary. The authors must send brief bio-data (100 words) and the recommendations that they would like to be considered as a part of the conference based on their presentations.

Posters: Size A 0 and template as per

http://wgbis.ces.iisc.ernet.in/energy/lake2022/posters/poster_template.pdf

EXHIBITION STALL

An exhibition of software and hardware related to the Environmental technologies, Restoration and Monitoring technologies, Water quality analysis, Geographic Information System (GIS), Global Positioning System (GPS), Remote sensing, Image processing and Cartography, as well as products and services of other organizations and agencies working in the area related to the theme of the conference, will be organised. Organisations / Agencies can participate in the exhibition on payment of fee of INR 25,000. Registered agencies would be allowed to make 10 minutes presentation. Interested agencies may contact the Lake 2022 secretariat and remit the fee through DD drawn in favor of "**Lake 2022 Symposium, Indian Institute of Science**" payable at Bangalore.

REGISTRATION FEE**

- Delegates: Rs. 3,000/-, Accompanying person: Rs. 1500/-
- Research Scholars and University faculty: Rs. 3,000/- (mandatory to attend all days)
- **Masters students:** INR 1500/- (mandatory to attend all days)
- **UG students:** INR 1000/- (mandatory to attend all days)
- Representatives from NGO: Rs. 5,000/-, Industry:15,000/-, Govt Agency: 5,000/-
- School and PU students: The organizing committee has decided to waive registration fee to school students and teachers **whose papers are accepted for presentation in the technical session.**

Registration fee to be paid either through Demand draft be drawn in favour of the "Lake 2022, Indian Institute of Science", payable at Bangalore or wire transfer **A/C 10270575339, IFSC Code SBIN0002215**, State Bank of India, Indian Institute of Science Branch, Bangalore 560012. DD to be sent along with duly filled in registration form.

****Registered Participants (Mandatory to attend all three days) will get the certificate on the concluding day of the conference.**

The registration fee would include registration kit, working lunch and tea during the symposium. Accompanying person will have access to all technical sessions and hospitality as per delegates except registration kit.

ACCOMMODATION

- Key speakers and invited delegates would be accommodated on the campus
- Delegates whose paper is accepted for the technical session will be accommodated on the campus on a first come, first serve basis.
- Participants requiring accommodation must mention the requirement in the registration form and be arranged in the student hostel / nearby hotels. Room rent is required to be paid by the delegates as per the tariff in the respective hotel (Rs. /person/day – non AC room and Rs /person/day for AC room). Accommodation will be arranged on a payment basis upon the request from the delegates.

EXPECTED OUTCOME

- Fostering participation of all stakeholders to ensure that individuals and organizations are provided an opportunity to participate in the development of aquatic resources – lakes conservation activities;
 - Encouraging intergovernmental initiatives through partnerships between communities and non-profit organizations;
 - Identifying significant natural, recreational, economic, cultural, scenic resources and aquatic ecosystem values;
- Identifying potential threats to aquatic resources and values;
Recommending policies and actions that can be undertaken to restore, maintain or enhance aquatic and terrestrial resources.

DATES TO REMEMBER

Registration [Submission of Registration form]	15 December 2022
Participants presenting papers/posters -Submission of scientific papers (full length / extended abstract), posters with the Registration Form (with the registration fee, depending on the category) –	30th November 2022
Review of Papers and posters by the committee	5th December 2022
Final submission of the revised manuscript (based on review)	5th December 2022
Notification of Acceptance of Papers (on web)	10th December 2022
Lake 2022 Conference	28-30th December 2022

Paper Acceptance details at:

<http://ces.iisc.ernet.in/energy>

E Mail: energy.ces@iisc.ac.in; lake2022.iisc@gmail.com

Address for Communication

Dr. T.V. Ramachandra

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Energy and Wetlands Research Group, TE 15,
Centre for Ecological Sciences, Third Floor, E wing,
New Bioscience Building, [Near D Gate],

Indian Institute of Science, Bangalore 560012

Phone: 91-080-22933099/2293 3503 (extn. 101/107)

E mail: tvr@iisc.ac.in,

energy.ces@iisc.ac.in

Lake2022.iisc@gmail.com

Conference Web: <http://ces.iisc.ernet.in/energy>



Energy & Wetlands Research Group, CES, Indian Institute of Science, Bengaluru

The Energy and Wetlands Research Group at the Centre for Ecological Sciences (CES), is actively involved in studies and training on issues related to the environment, water resources, energy, ecology, wetlands, geographic information systems, environmental impact assessment and natural resource management. The Centre for Ecological Sciences, founded in 1983 with the support of the Ministry of Environment, Forests and Climate Change (MoEFCC), offers exciting research opportunities in various areas in ecology. Over the past 40 years, CES have instilled a tradition of rigorous enquiry in diverse areas of ecology, evolution and behavior. The projects of CES are often integrative which uses multiple approaches, from theoretical and laboratory studies to field-based research, to explore the research questions. A number of CES research areas are breaking new ground in ecology while others have significant roles in conservation. Details at <http://wgbis.ces.iisc.ernet.in/energy>

https://www.researchgate.net/profile/T_V_Ramachandra/publications
<https://scholar.google.co.in/citations?user=Woh1fa8AAAAJ&hl=en>

Indian Institute of Science (<https://iisc.ac.in>)

The Indian Institute of Science (IISc) was founded in 1909 as a result of the joint efforts of Jamsetji Nusserwanji Tata, the Government of India, and the Maharaja of Mysore. In 1886, Jamsetji Tata conceived of a university of science that will work for the benefit of India, and in 1898 created an endowment for establishing such an institution. Over the last 112 years, IISc has become India's premier institute for advanced scientific and technological research and education. Its mandate is "to provide for advanced instruction and to conduct original investigations in all branches of knowledge as are likely to promote the material and industrial welfare of India." In keeping with this guiding principle, the Institute has strived to foster a balance between the pursuit of basic knowledge and applying its research for industrial and social benefit. IISc's research output is diverse, interdisciplinary and cuts across traditional boundaries. The Institute has over 42 academic departments and centres that come under six divisions. It also places equal emphasis on student learning, with about 4000 students pursuing several postgraduate and PhD programmes, as well as a dedicated four-year undergraduate programme aimed at providing research-oriented training for young students in the basic sciences.

Centre for Environment Education (CEE), Bangalore

Centre for Environment Education (CEE) Ahmedabad was established as a Centre of Excellence under the Ministry of Environment, Forest and Climate Change, Govt. of India, working in the field of Environmental Education and Education for Sustainable Development. CEE develops innovative programmes and educational material and builds capacity in the field of Education for Sustainable Development (ESD). It is committed to ensure that Environmental Education (EE) leads to action for sustainable development. It undertakes field projects that demonstrate and validate the role education can play in sustainable development. CEE South is the southern regional office of the centre looking after the projects in the states of Karnataka, Tamil Nadu, Telangana, Andhra Pradesh, Kerala and UTs of Andaman & Nicobar, Puducherry and Lakshadweep Islands on implementation of the awareness

and action programmes related to environment and development issues through innovative methodologies and approaches. Email: ceesouth@ceeindia.org

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Conservation of Wetlands: Ecosystem-based Adaptation of Climate change
28th -30th December 2022,

**Venue: Auditorium, Ground Floor, Bioscience Building [Near D Gate],
INDIAN INSTITUTE OF SCIENCE, Bangalore 560012**

Registration form (to be sent by 15 November 2022)

1	Name		PHOTOGRAPH
	Aadhar Number		
2	E mail		
3	Mobile		
4	Phone		
5	Fax		
6	Designation		
7	Department		
8	Institution		
9	Organisation Address		
10	Correspondence Address		
12	Presenting -	Paper	poster
13	Title (paper / poster)		
	If Yes, Title of the paper /Poster		
	Enclosed: Abstract / Paper (e-version and hard copy): (Please ensure CD is virus free)		
	e-version of the Abstract and paper be sent to: energy.ces@iisc.ac.in ; lake2022.iisc@gmail.com		
14	Registration fee	Amount: DD No:	Date:
	Bank		
	Wire Transfer	Amount: UTR No:	Date:
15	Accommodation	Required	YES / NO
	Accommodation Charges	Amount: DD No:	Date:
	Bank		
	Wire Transfer	Amount: UTR No:	Date:
16	Travel Details	Arrival	Date & time
		Departure	Date & time

(All fields must be filled) *DD in favour of 'Lake Symposium, Indian Institute of Science'

Signature of Participant

**Signature of
HOD/Principal** (in case of students)

Place: _____ **Date:** _____

Organisation: _____