

# KSCSTE NEWS

A QUARTERLY NEWSLETTER OF KSCSTE  
VOL.II | ISSUE : 4 | OCTOBER - DECEMBER 2023





**KERALA STATE COUNCIL FOR  
SCIENCE, TECHNOLOGY AND ENVIRONMENT (KSCSTE)**  
കേരള ശാസ്ത്ര സാങ്കേതിക പരിസ്ഥിതി കൗൺസിൽ

An Autonomous Institution of Science &  
Technology Department, Government of Kerala  
Sasthra Bhavan, Pattom, Thiruvananthapuram,  
Kerala 695004 + 91-471-2548200 email: kscste@kerala.gov.in

*Editor in Chief*

**Prof K P Sudheer**  
Executive Vice President, KSCSTE

*Editor*

**Dr S Pradeep Kumar**  
Member Secretary, KSCSTE

*Editorial Board*

**Dr Ajit Prabhu V**  
Chief Scientist, KSCSTE

**Dr Anilkumar C**  
Senior Principal Scientist, KSCSTE

**Dr C Arunan**  
Principal Scientist, KSCSTE

**Dr Rajendraprasad M**  
Principal Scientist, JNTBGRI

**Dr Raghu A V**  
Principal Scientist, KFRI

**Er Subin B**  
Senior Scientist, NATPAC

**Dr Sruthi K V**  
Junior Scientist, CWRDM

*Layout, Design & Print*  
**Akshara Offset**  
Thiruvananthapuram  
Ph : 0471-2471174

*Published & Printed on behalf of*  
The Member Secretary, KSCSTE  
Thiruvananthapuram

*Published from*  
Kerala State Council for  
Science, Technology and Environment (KSCSTE)  
Sasthra Bhavan, Pattom, Thiruvananthapuram 695 004

*(Private Circulation only)*



*Museum of the Moon*

## Global Science Festival of Kerala (GSFK)

Global Science Festival of Kerala (GSFK) celebrates the quest for knowledge, bringing together individuals from diverse backgrounds to explore the beauty of science. GSFK is scheduled to take place in January 2024 at the Bio 360 Life Sciences Park at Thonnakkal in Thiruvananthapuram, Kerala, this festival offers a world of possibilities. Visitors can explore a curated science exhibition, attend public talks by internationally renowned scientists, collaborate with experts in a science congress, and witness cutting-edge technology in industrial pavilions. The festival will hold collateral programs at various institutions, cities, and villages leading to February.



GSFK aims to become a revolutionary event in the field of secondary science education in Kerala. The festival welcomes students, scientists, and the public worldwide and expects a footfall of over 1.2 million people from South India alone. With its unique blend of science and culture, this festival promises to set a new standard for science festivals.

### Museum of the Moon

As a prelude to the GSFK, the "Museum of the Moon" was showcased on 5<sup>th</sup> December 2023 at Kanakakunnu Palace, Thiruvananthapuram. The programme was inaugurated by Shri. K.N. Balagopal Hon'ble Finance Minister, Government of Kerala. People turned up in thousands to see the installation and Exhibition.

Museum of the Moon is a touring artwork by UK artist Luke Jerram. Seven meters in diameter, the moon features 120 dpi detailed NASA imagery of the lunar surface. At an approximate scale of 1:500,000, each centimetre of the internally lit spherical sculpture represents 5 km of the Moon's surface. The installation is a fusion of lunar imagery and has an accompanying surround sound composition created by BAFTA and Ivor Novella award-winning composer Dan Jones.

### The Curated Science Exhibition

The Curated Science Exhibition is to learn about the complexities of human existence, the cosmos, and more through simulated environments and full-scale models. It thoroughly examines the scientific method's achievements and limitations through a fusion of art and technology. Festival attendees can walk through a Panoramic 3D installation of the Universe and traverse through various parts of the human brain and more. Experience the terrifying reality of war and retrace our collective past through an immersive experience that utilizes Augmented Reality and Virtual Reality. Hundred and more art exhibitions, including thirty gigantic installations and world-renowned curated artwork, such as the Museum of the Moon at GSFK.

### A chance to learn from the experts - Public Lectures

GSFK includes lectures by personalities from diverse professions, providing an opportunity to listen and learn from them. Public lectures on science, art, culture, politics, literature, film, and gaming will be held at the festival pavilion and in select few institutions across Kerala. Every lecture will be live-streamed on all major social media platforms.

### A call to the Scientist in you - Everyday Science

GSFK presents the public with a unique challenge; interact with creative research issues, conduct experiments, and gather data to validate them. The event engages with scientific thinking outside the parameters of conventional research. Citizens and students in particular, are given the golden opportunity to pick a topic and engage with it deeply using scientific methods. They can then showcase their results as a part of the festival

### Learn the role science play in art - Science in art

The festival includes a section devoted to exhibiting advancements in art through science. This event aims to alter how the general public views science by demonstrating its important in developing art. It will comprehensively showcase modern and experimental music, film, and visual artworks.

### Science for all - Satellite Programmes

Programs and seminars will be planned concurrently at esteemed institutions nationwide to catalyze independent science festivals and encourage a culture of scientific curiosity. As a part of the festival various outreach programmes are conducted in association with the Government of Kerala and multiple NGOs throughout the year leading up to the main celebration. The primary goal of these programmes will be to spread the wonders of science and scientific thinking to every educational institution in Kerala.

### The city as a beacon of science - Street installations

The placement of evocative street installations will promote a city-wide awareness of the sciences. The exhibits will use technology such as 3D mapping to communicate fundamental scientific concepts. Notable individuals such as Nobel laureates and their contributions to science will be highlighted through these displays.

Outreach programmes, satellite events and various exciting campaigns will occur throughout the year from July onwards, culminating in a festive gathering.



# Highlights of Important Programmes

## 36<sup>th</sup> KERALA SCIENCE CONGRESS

The 36<sup>th</sup> Kerala Science Congress, scheduled for February 8<sup>th</sup> to 11<sup>th</sup>, 2024, to be hosted at Government College, Kasaragod, heralds a momentous convergence of scientific minds. The event will witness the presence of the Hon'ble Chief Minister of the State on February 9<sup>th</sup>, 2024, inaugurating the Science Congress. The Science Congress centers on the focal theme of "Transforming Kerala's Economy through One-Health Approach." Dr. Soumya Swaminathan, Chairperson of MSSRF, Chennai, and former Chief Scientist at the World Health Organization, serves as the Chairperson of the 36<sup>th</sup> Kerala Science Congress. The event will feature a national science exhibition commencing on February 8<sup>th</sup>, poised to host numerous national institutes and emerging start-ups, amplifying their contributions and innovations.

The Science Congress is set to deliver an array of enriching programs, including Focal Theme Lectures, Memorial Lectures, P.G. Student Interaction, Children's Science Congress, Walk-with Scientists, SciScol, and technical paper presentations by researchers. Among the plethora of engaging activities, a standout feature of the 36<sup>th</sup> Kerala Science Congress will be the lecture by Prof. Morten Meldal, the Nobel Laureate in Chemistry (2022), alongside his engaging interaction session with students present at the venue. The focal theme lectures will be delivered by Dr. B Ekbal, former Vice Chancellor, Kerala University and Chairperson, State Expert Committee Covid 19 management and Prof. Mathew George, Department of Public Health and Community Medicine, Central University of Kerala.

A new Memorial Lecture in memory of Dr. M.S. Swaminathan has been initiated this year. The memorial lecture series comprises four lectures to be held at KSC venue and four across different institutes preceding the Science Congress event. Dr. Muralee Thummarukudy, Director, G20 Global Initiative, UNCCD delivered the Dr. Pisharoty Memorial Lecture on 27<sup>th</sup> December, 2023, at KSCSTE-KFRI, discussing "Global Initiatives on Land Restoration: Unique Opportunities and Challenges for Kerala." The upcoming G.N. Ramachandran Memorial Lecture is scheduled for 12<sup>th</sup> January, 2024, to be delivered by Dr. Shekhar Mande, former Director General, CSIR at RGCBS, Trivandrum on the topic "G.N. Ramachandran and the Development of Structural Sciences in India".

The Thanu Padmanabhan Memorial Lecture by Prof. Ajith Parameswaran from the International Centre for Theoretical Sciences (ICTS), TIFR, Bangalore, will take place on 18<sup>th</sup> January, 2024, at the School of Pure and Applied Physics, M.G. University Kottayam on the topic Universe -: "Yesterday, Today and Tomorrow". Additionally, the P.K. Iyengar Memorial Lecture by Dr. Dinesh Kumar Aswal, Director of Health and Safety & Environment Group at BARC, Mumbai, is set for 22<sup>nd</sup> January, 2024, at KSCSTE-CWRDM on the topic: Radiation, nuclear energy and Environment.

At the Science Congress venue, memorial lectures by Dr. Swati Nayak, Scientist at the International Rice Research Institute, New Delhi; Dr. A.A. Mao, Director of the Botanical Survey of India, Kolkata; Shri. K. Jayakumar, Director of the Institute of Management in Government, Trivandrum (and former Vice Chancellor of Malayalam University) and prof. K.J. Joseph, Gulati Institute finance and taxation (GIFT), Thiruvananthapuram will commemorate MS Swaminathan, E.K. Janaki Ammal, P.T. Bhaskara Panicker, and P.K. Gopalakrishnan, respectively.

Professor K.P. Sudheer, the Executive Vice President and President of the 36<sup>th</sup> Kerala Science Congress, along with Dr. S. Pradeep Kumar, the Member Secretary and General Convenor of 36 KSC, Dr. Manoj Samuel, the Executive Director and Convenor of the Organising Committee for the 36<sup>th</sup> KSC, and Dr. V.S. Anilkumar, Principal of Govt College Kasaragod and Co-Convenor of the 36<sup>th</sup> KSC, work extensively with various committees to ensure the successful execution of the event. KSCSTE-CWRDM is the host R & D intuition in organizing the 36<sup>th</sup> KSC.

### Prof. Morten Meldal

Morten Meldal was awarded the Nobel Prize in Chemistry 2022. Morten Meldal is a professor at the University of Copenhagen and head of the Center of Evolutionary Chemical Biology. He has served as the Deputy Head of Department for Education (VILU) at UCPH's Department of Chemistry. He has a unique influence on methods used in peptide and combinatorial chemistry. His specialties span combinatorial chemistry, click chemistry, polymer chemistry, organic synthesis, automation in synthesis, artificial receptors and enzymes, nano assays, biomolecular recognition, enzyme activity, cellular assays, molecular immunology, nano scale MS and NMR, encoding. He founded the Society of Combinatorial Sciences, of which he is also president. He has published more than 300 publications and holds 21 patents. He is also the company founder and CSO of Betamab, a company that conducts biotechnology and pharmacological research, diagnostics and pharmaceutical development.



## National Children's Science Congress (NCSC)

The state level Children's Science Congress as part of 31<sup>st</sup> NCSC was held on 2<sup>nd</sup> and 3<sup>rd</sup> December at Agricultural Cooperative Staff Training Institute (ACSTI), Thiruvananthapuram. Prof. K P Sudheer, Executive Vice President inaugurated the congress in a function presided by Dr. S. Pradeep Kumar. Prof. C P Aravindakshan, Prof A Biju Kumar, Dr V Ajit Prabhu and Dr Harinarayanan were spoke during the programme.



A total of 116 projects were presented in the State level congress. 16 child scientists are selected to NCSC. Shri. M. C. Dathan, Mentor Science, Government of Kerala delivered the validity address and presented the mementos to the selected teams. Dr. S. Pradeep Kumar, Member Secretary KSCSTE presided. Prof. C. P. Aravindakshan, Prof. E. Kunhikrishnan, Dr. Harinarayanan and Dr. A. R. Sarika were spoke in the function.

## Rural Innovators' Meet (RIM) 2023

Rural Innovators' Meet (RIM) is an annual event of KSCSTE for encouraging and promoting rural innovators and grass-root innovators for developing rural technologies. The programme provides a platform for the rural innovators to exhibit their innovations and also to interact amongst fellow innovators and with experts. RIM 2023 was organized in two tiers – regional and State level. Regional RIMs were organized at the five nodal institutions identified by KSCSTE. The regional RIM of Thiruvananthapuram-Kollam region was organized at KSCSTE Headquarters, Sasthra Bhavan on 24<sup>th</sup> November 2023, the regional RIM of Malappuram-Palakkad region was organized at the Integrated Rural Technology Centre (IRTC) on 25<sup>th</sup> November 2023, the regional RIM of Ernakulam- Thrissur region was organized at Christ College of Engineering on 28<sup>th</sup> November 2023 and regional RIMs of Pathanamthitta-Idukki-Kottayam-Alappuzha region and



Wayanad-Kozhikode-Kannur-Kasaragod region were both organized on 30<sup>th</sup> November 2023 at Institute of Climate Change Studies (ICCS), Kottayam and Malabar Botanic Garden and Institute for Plant Sciences (MBGIPS) respectively. The winners from the regional RIMs, shortlisted by regional Judging Committees of respective regions, participated in the State level Rural Innovators Meet held during 19<sup>th</sup> and 20<sup>th</sup> December, 2023 at the Kerala Forest Research Institute, Peechi. KSCSTE - RIM 2023 was inaugurated by Shri. Karthik Panigrahi, IAS, Sub-Collector, Thrissur in a function presided by Prof. K. P. Sudheer, Executive Vice President, KSCSTE. The Proceedings of RIM-2023 which includes the details of all innovations presented in the Regional and State level RIM were released by Shri. Karthik Panigrahi, IAS during the inaugural function. Twenty-two innovations were presented in RIM-2023, 14 of which were in contest category and 8 were in exhibition category. Also, exhibition stalls

of premier institutions in the rural technology sector such as the Integrated Rural Technology Centre (IRTC), Malabar Botanic Garden and Institute for Plant Sciences (MBGIPS), Kerala Agricultural University etc were showcased during the event. A State level Judging Committee constituted by KSCSTE evaluated the innovations and recommended the best innovations eligible for awards.

Apart from the contest, two technical talks, one on IPR & Entrepreneurship and the second on Programmes and Policies of Ministry of MSME were held during RIM for the benefit of the innovators. The Valedictory function of KSCSTE RIM – 2023 was organized on 20<sup>th</sup> December, 2023. The awards were announced during the valedictory function by Prof. Jippu Jacob, Chairman, Judging Committee. Shri. Anoop Ambika, CEO, Kerala Start Up Mission, distributed the awards to the innovators. The details of awards presented in RIM-2023 are as follows.

Details of awards	Innovation	Innovators
Chief Minister's Rural Innovation Award (Rs. 1,00,000/-)	Agri Nano Excavator	Shri. Sadasivan M, Palakkad
Rural Innovation Awards (Rs. 25,000/-)	Jose Pepper Plucker	Shri. Jose K. C, Thrissur
	All in one Electrical Tester	Shri. Bhagyaraj P. K., Pathanamthitta
Student Rural Innovation Awards (Rs. 10,000/-)	Solar powered I-AUV for removing Oil Spills from Water Bodies.	Ms. Ambily Udayakumar, Ms. Archana P. A., Ms. Sivapriya U. R., Ms. Surya, Krishna Prasad ToCH Institute of Science and Technology, Ernakulam
	Bio-plastic from waste agricultural leaves	Ms. Silviya Rachel Babuji, Ms. Jayalekshmi S., Ms. Lakshmi Pradeep Amal Jyothi College of Engineering, Kanjirapally, Kottayam
Special Awards (Rs. 5,000/-)	SmartFence : Intelligent Wildlife Protection System for Farms	Mr. Jacob George, Mr. Pratheek Rao K. B., Mr. Nithish Nayak, Mr. Akshay V. S. LBS College of Engineering, Kasaragod

## Sustainable lifestyle workshop for School teachers

The Kerala State Council for Science, Technology, and Environment (KSCSTE) - Environmental Education Programme (EEP) has provided financial assistance for organizing Sustainable Lifestyle workshops for Ecoclub teachers in various districts in association with the NGC District Implementation committee. A total of 28 training programmes were planned, out of which 20 have been successfully completed. These workshops focus on a hands-on training approach rather than relying solely on lecture-based methods. The training covers a wide range of topics including the establishment and activities of Ecoclubs in schools, environmental projects, waste management, and the concept of 4R's (Reduce, Recycle, Recover, and Reuse). Additionally, the workshops address important subjects such as energy and water conservation, control of plastic pollution, sustainable healthy lifestyles, climate change and its impact on ecosystems, and the biodiversity around us. These Sustainable



Lifestyle workshops aim to equip teachers with the knowledge and skills necessary to promote sustainable practices and environmental awareness among students. By providing practical training and covering various relevant topics, the workshops contribute to building a more environmentally conscious society in Kerala.

## Hands on training for school students



The Kerala State Council for Science, Technology, and Environment (KSCSTE) - Environmental Education Programme (EEP) has provided financial assistance for organizing Sustainable Lifestyle workshops for school students in various districts in association with the NGC District Implementation committee. A

total of 28 training programs have been successfully completed. The program provided hands-on training to students on various topics such as tissue culture, waste management techniques, plantation methods, mushroom cultivation, water quality analysis, paper bag making, recycling of old clothes, LED bulb making workshops, making seed balls, identification of medicinal plants, identification of butterflies, bird watching, and traditional knowledge transfer. These training programs aim to enhance the knowledge and skills of students, promoting sustainable lifestyles and environmental conservation practices.

## Nature Camps –a walk to Nature



Kerala State Council for Science, Technology, and Environment (KSCSTE) sanctioned and released financial assistance for organizing 16 nature camps during the 2023-24 financial year in various districts of Kerala in association with the NGC District Implementation committee. Out

of these, 12 nature camps have been completed. The nature camps covered several sanctuaries, including Neyyar Wildlife Sanctuary, Thekkady (1 camp), Scedurney Wildlife Sanctuary (3 camps), Wayanad (2 camps), Muthanga (2 camps), Karimpuzha (2 camps), Choolannur

Peacock Sanctuary (1 camp), and Aaralam Wildlife Sanctuary (2 camps). These nature camps provide opportunities for students to connect with nature, learn about wildlife, and promote environmental awareness and conservation efforts.

- Established new 'short range weather forecast products' for Kottayam region using Weather Research and Forecast model –WRF.
- Initiated new project titled "An investigation on groundwater regime in and around Vismaya Rocks Private Limited, Kadakkal, Kerala" to MD, Vismaya Rocks, Kollam.
- Initiated a collaboration with IRTC, Palakkad to implement "One Local Government One Idea (OLOI)" program of K-DISC in 13 local bodies of Kerala.
- Initiated a project titled 'Practical evaluation of the scope of onsite grey water reuse in residential apartment communities- a model study' in collaboration with Confident Group.
- GAIL (India) Limited, Govt. of India support production of Biodegradable Coir Fibre Based Root Trainer (CRT) for planting stock of Medicinal Plants for Health Security, Eco-restoration, Climate Change Mitigation and Tribal Livelihood Enhancement in Kerala.
- United States Agency for International Development (USAID) funds a study on Cost Benefit Analysis (CBA) on Eco restoration at selected eco-restored sites.
- National Medicinal Plants Board, Ministry of AYUSH, Govt. of India supports the National Campaign on Ashwagandha - A Health Promoter (Southern Region)
- Kerala State Council for Science, Technology & Environment (KSCSTE) under the Research Grant Scheme of KSYSA programme supports the regional and global conservation assessment of genus *Impatiens L.* in the Western Ghats with particular reference to endemics in Kerala.
- Initiated re-landscaping of the central nursery backyard landscape in the banks of Chittar, old Rose garden area and interlock paving of the road underneath of the Ficus arch and fruit garden road entrance.
- Establishment of Bamboo Museum cum Incubation Centre at JNTBGRI, funded by Kerala State Bamboo Mission.
- Upgradation of Bamboo Craft Centre, funded by Kerala State Bamboo Mission.
- Establishment of Centre of Excellence in Phytochemical-Nanotechnology at KSCSTE-JNTBGRI under SHRESTA.
- Phytochemical incorporated scaffolds for regeneration in osteoarthritis - an experimental approach.
- Two project programmes were initiated to assess the diversity of wild edible mushroom resources of Kerala and evaluation of its antimicrobial potential. Screened 10 wild edible mushrooms for their antimicrobial properties. Three species showed promising antimicrobial properties. *Streptomyces* sp WPF1 ethyl acetate extract efficiently inhibited growth of human pathogens *Streptococcus pyogenes* and *Staphylococcus aureus*. The extract also inhibited biofilm formation by the pathogens. Thin layer chromatography experiments determined the active fraction responsible for antimicrobial/antibiofilm activity.
- Conducted Studies on conservation biological aspects of selected flowering plant wealth of Kerala (plan project) Kerala Forest Development funded project "Triparty action plan for the reintroduction of Red plants of Kerala" was completed.
- Propagules of *Garcinia imberti* and *Betinkia condappana*, endemic to Southern Western Ghats and IUCN red listed were collected for species restoration.
- Establishment of a Bamboo Tissue Culture Unit and Expansion of Bamboo Conservatory at JNTBGRI (Funded by Kerala State Bamboo Mission)





Stakeholder Consultation for the Preparation of "Road Safety Action Plan for Kerala" (RSAP-K) Government of Kerala has entrusted NATPAC to prepare a comprehensive action plan for road safety for the State after obtaining views/suggestions from all the stakeholders' departments/institutions. In this connection, a Stakeholder Meeting was organized by KSCSTE-NATPAC on 26th October 2023 at Government Guest House, Thycaud, Thiruvananthapuram. The program

was inaugurated by the Hon'ble Minister for Transport Adv. Antony Raju. Dr Ravi Raman, Member, Kerala State Planning Board presided over the inaugural session. Shri. Jyothilal IAS, Additional Chief Secretary, GoK delivered the keynote address. Shri. Sparjan Kumar IPS, Inspector General of Police, GoK was present in the program.



- Seasonal assessment of SST, SSS, Heat content over both the Arabian Sea and Bay of Bengal for the period from 1980 to 2022.
- Multivariable calibration of hydrologic models over Pamba and Bharathapuzha river basins.
- Setting-up of VIC model for Kerala at 0.25-degree grid spacing.
- Preparation ETCCD Indices for Kerala and analyzing its spatio-temporal variations.
- Landsat imagery-based coastline change study for Kerala.

- Waste management division of IRTC visited Thrikaripur Panchayat, Kasargod and Pala Municipality, to address the issues of the Local Bodies under One Local Body One Idea (OLOI); prepared Preliminary Project Report (PPR) after field visits, focus group discussions and interviews. Waste management division of IRTC prepared the Expression of Interest (EoI) for the Empanelment of Domain Institutions under One Local Government One Idea Program (OLOI) of KDISC to build innovative solutions to address various issues suggested by LSGIs.
- IRTC has signed an Agreement with Moonilavu Panchayat, Kottayam in the month of December 2023, regarding the Wind Potential study and wind power production scopes in the Panchayat. Energy Division along with Centre for Geo informatics, IRTC will be doing the field study in the Period from Jan 2024 to Mar 2024.
- Participatory yield enhancement trial in paddy for the third year continued along with maintenance of traditional rice germplasm conservation plot at farmer's field.
- One field trial to study the effect of biochar on soil health in coffee plantation and cowpea being continued at the centre. Biometric data including yield, number of berries, canopy, etc. will be taken up for this year.
- Studies continued in various Panchayaths of Wayanad to study the dynamics of NTFPs utilization and challenges faced by the Kattunaika community of Wayanad.

- Participatory yield enhancement trial in paddy for the third year continued along with maintenance of traditional rice germplasm conservation plot at farmer's field.
- One field trial to study the effect of biochar on soil health in coffee plantation and cowpea being continued at the centre. Biometric data including yield, number of berries, canopy, etc. will be taken up for this year.
- Studies continued in various Panchayaths of Wayanad to study the dynamics of NTFPs utilization and challenges faced by the Kattunaika community of Wayanad.

## Significant Innovation / Invention

Eco-friendly coir-based biodegradable root trainers to avoid plastics innurseries



## Facilities / Infrastructure Created

- Portable Automatic Weather Station -2
- Establishment of a Centre for DNA Barcoding & Timber Forensics supported by Kerala Forest Department.
- Strengthening KFRI Central Nursery to accommodate increased plant propagation activities. Funded by GAIL (India) Limited, Govt. of India
- Modernisation of Kerala Forest Seed Centre, Funded by National Medicinal Plants Board, Ministry of AYUSH, Govt. of India.
- Established a model nursery at Devikulam Field Research Station, Munnar for QPM production especially of shola species. Funded by National Horticulture Mission, Govt. of India.
- Establishment of Centre of Excellence in Phytochemical-Nanotechnology at KSCSTE-JNTBGRI under SHRESTA: Establishment of Centre of Excellence in Phytochemical-Nanotechnology (CEP) at KSCSTE-JNTBGRI (Sanctioned amount 200 lakhs for 5 years). Excellence in Phytochemical-Nanotechnology is a niche area in the advanced nanotechnology where great attention is needed for the development of useful products to the society as well as to create scientifically trained manpower in the concerned area of nanotechnology for the development of our State/Nation. In phase one (1 and 2 years) and Phase II (3,4 and 5th years) deliverables like wound healing phytochemical embedded nano-pads and nano encapsulated essential oil for food grain pest management are envisaged. In human resource development the programme envisages training to researchers, industrial collaborations, collaborations with national and international R&D centres (in I and II phases, SCTIMST Trivandrum is the national collaborator and University of Oklahoma Health Science Centre, Oklahoma City, USA is the International collaborator). The CEP also provides a platform for researchers and industries for the onsite synthesis of nanomaterial from phytochemicals. The patents and training fee, royalties are focused in the II phase of the programme, which will enhance the CEP as a self-sustainable entity.
- Re-arrangement of the display of water plants in the terraces and road sides with the reservoir as background



- Frontage Rose garden area is re-landscaped with perennial and annual beds being provided with pebble stone background; the road underneath of the Ficus arch is being paved with interlocks; entrance of the fruit garden road entry is on paving with interlocks; the central nursery backyard landscape in the banks of Chittar is on process of developing into a visitor's leisure landscape.
- Construction of gallery model display steps for demonstrating the specially adapted water plants is in progress.
- A LC-MS has been procured and installed at the Institute Central Instrumentation Facility.

- Purchased a Refrigerated Centrifuge (5804R) for research purposes utilizing the fund from DST-SERB, Govt of India for the project on Conservation of *Crinum malabaricum* Lekhak & S. R. Yadav (Amaryllidaceae); a critically endangered aquatic plant of medicinal importance.
- Purchased a Maruti Suzuki EECO 5-seater- BS VI from the institution corpus fund, for the use in garden; for transportation of plants, etc and for travelling purposes including participation in exhibitions.
- RET Conservatory and crop germplasm (cowpea, tubers, wild edibles, etc.) maintained at the centre



## Technologies Established/ Demonstrated

- “Demonstration of spices cultivation in the naturally ventilated polyhouse”, funded by Directorate of Arecanut and Spices Development, Ministry of Agriculture and farmers welfare.

## Research Academic Programmes

	CWRDM	KFRI	JNTBGRI	MBGIPS	ICCS	NATPAC
Plan Funded	54	40	18	1	5	20
Externally Funded	18	49	37	5	1	
Consultancy Funded	22					15
Phd	10	39	19	7		
M. Tech / MSc Dissertation	4	40		39		27

## Training programmes / Workshops / Internships organised

### ASPIRE (Aspiring Students in Progressive and Innovative Research and Education): 2023

Scheduled Caste (SC) and Scheduled Tribe (ST) cell, Kerala State Council for Science, Technology, and Environment organized a week-long science orientation cum institutional study visit program named ASPIRE for plus two science batch Scheduled Tribes students from Model Residential Higher Secondary schools. The ASPIRE 2023 was hosted by KSCSTE - Malabar Botanical Garden & Institute for Plant Sciences, Kozhikode from 20<sup>th</sup> to 25<sup>th</sup> November 2023. 45 students and 9 teachers participated. The programme was inaugurated by Dr N S Pradeep, Scientist in charge at MBGIPS in a programme presided over by Dr. P. Harinarayanan, Senior Principal Scientist, KSCSTE. Dr. Nidish Kumar, Dr. Regupathy and Dr. Hareesh VS spoke during the inaugural function.



Dr. S Pradeep Kumar, Member Secretary KSCSTE delivered the Valedictory address and distributed the certificates. Dr N S Pradeep, Scientist in charge at MBGIPS presided over the function. Dr. P.

Harinarayanan, Senior Principal Scientist, KSCSTE. Dr. Nidish Kumar and Dr Manjula spoke during the occasion.

### Field Survey

The Project team of SC&ST cell conducted field survey in the various settlements of SC and ST community in Idukki, Kasaragod, Pathanamthitta, Thiruvananthapuram, Palakkad, and Wayanad districts to collect the data pertaining to the livelihood to identify the requirements of Science and Technology based solution for the sustainable development.





## Regional Evaluation Workshop of EIACP Centres – Southern Zone

A two -day Regional Evaluation Workshop of the EIACP Programme Centres of South Zone was held on 9<sup>th</sup> & 10<sup>th</sup> October 2023 at Hotel Apollo Dimora, Thiruvananthapuram hosted by Kerala State Council for Science Technology and Environment (KSCSTE). Around 60 participants from 17 South Zone centres participated in the two day workshop and presented their activities and achievements during the programme. The programme was inaugurated by Dr. Rathan U. Kelkhar IAS, Secretary, Environment Department, Government of Kerala. Prof K.P Sudheer, Principal Secretary, S & T Department & Executive Vice President, KSCSTE presided over the function. Dr. P. Harinarayanan, Senior Principal Scientist, KSCSTE and EIACP Coordinator welcomed the guests during the function. The keynote address was given by Mrs. Anshu Singh, Deputy Director General, Statistics Division, MoEF & CC and the special address was given by Prof. Usha Mina, Jawaharlal Nehru University (JNU), New Delhi. Dr. Unmana Sarangi, Joint Director, EIACP, MoEF & CC introduced the significance of the programme and stressed the need to evolve the EIACP Scheme as a one of the tools of Decision Support available to the Government of India for formulating various environmental policies and decisions. Dr. Sarika A.R, Senior Scientist, KSCSTE delivered word of thanks during the programme.



WRMTP training programme on “Integrated Watershed Management – Monitoring and Evaluation”, during 27<sup>th</sup>-30<sup>th</sup> November 2023. About 30 participants attended the training programme

Two-weeks training programme (September 25<sup>th</sup> - October 07<sup>th</sup>, 2023) as funded by KSCSTE on “Value Addition Technologies of Agricultural Byproducts for the Skill Empowerment of Low-Income People for the Better Livelihood” with Dr. J. Beslin Joshi as Programme Coordinator, Dr. Sarathjith M C and Dr. Santosh Onse as Programme Co-coordinators organized by Land and Water Management Research group.

## Mission LiFE Programme



- In connection with Mission LiFE Programme Mass Awareness campaign has been conducted in Trivandrum and Kollam Districts. Around 1700 participants attended the programme.
- Organised Hands-On training program on ‘Physico-Chemical and Bacteriological Analysis of Water’ for the students of Postgraduate Department of Biology, Sree Narayana Guru College Chelannur in the Water Quality Laboratory of Ecology and Environment Research Group from 27<sup>th</sup> - 29<sup>th</sup> November 2023.
- Hands on training on ‘Physico-chemical and bacteriological analysis of water samples’ for the M. Tech students of KMCT College of Engineering for Women from 14<sup>th</sup> December 2023 to 16<sup>th</sup> December 2023
- Karyashala Workshop on ‘Watershed Planning and Management: Application of Advanced Tools and Disaster Reduction Strategies’ during 4<sup>th</sup> to 17<sup>th</sup>, October, 2023. The program was funded by Science & Engineering Research Board, Department of Science and Technology, Govt. of India. Around 25 participants, covering 8 States from India participated the workshop.
- Internship to M.Sc. Chemistry students of S.B. College, Changanassery and University of Hyderabad from 26<sup>th</sup> December 2023 to 30<sup>th</sup> December 2023 WRMTP ; ‘Wetland Bio researches for Environmental Sustainability’ on 23<sup>rd</sup>-25<sup>th</sup> November 2023 at CWRDM HQ
- WRMTP ; ‘Water quality monitoring and Good Laboratory Practice 4<sup>th</sup> - 5<sup>th</sup> December 2023 at Sub Centre, Neyyattinkara
- Stakeholder workshop for the project on ‘Post facto evaluation of Irrigation projects implemented in Kerala state’, at Palakkad on 3<sup>rd</sup> October 2023.
- WRMTP training programme on “Irrigation Water Management – Micro Irrigation and Advanced Irrigation Techniques”, during 20<sup>th</sup>-23<sup>rd</sup> November 2023. About 34 participants attended the training programme.
- WRMTP training programme on “Wetland Bioresources for Environmental Sustainability”, during 23<sup>rd</sup>-25<sup>th</sup> November 2023. About 14 participants attended the training programme.

- WRMTP on “Climate Change & Water Resources” from 07<sup>th</sup> to 09<sup>th</sup> November 2023
- Kozhikode District Level competitions of National Children’s Science Congress held at CWRDM on 10<sup>th</sup> November 2023
- Online meeting on and demo on access to e-books as part of the e-books awareness campaign of Cambridge University Press, on 22<sup>nd</sup> December, 2023
- CWRDM took the initiative to coordinate a webinar in celebration of “World Soil Day” with the compelling theme, ‘Soil and Water: A Source of Life.’ This event took place on the 5<sup>th</sup> December 2023, from 3:30 pm to 4:30 pm, hosted virtually at the CWRDM
- Conducted an international webinar on ‘Water budgeting and rainwater harvesting’ on 28<sup>th</sup> November, 2023, in collaboration with USAID, LRWHF and SARNET. Dr. Manoj P Samuel, Er. Vivek B and Dr. C. M Sushanth delivered talk during the event..
- Conducted WRMTP training on ‘introduction to QGIS and QSWAT’ from 20<sup>th</sup>-23<sup>rd</sup> October, 2023 at CIFT, Cochin.
- Three-day workshop on Science for students from Model Residential Schools in Kerala Scheduled Tribes Development Department, Govt. of Kerala, at KSCSTE-KFRI, 8<sup>th</sup>-10<sup>th</sup> November 2023
- One-Week Compulsory Training Course on ‘Managing green spaces for urban biodiversity and ecosystem services’ for Indian Forest Service Officers, 20<sup>th</sup> – 24<sup>th</sup> November 2023. Ministry of Environment, Forest and Climate Change (MoEF & CC), Govt. of India.
- Ten – Days Training Course on Empowering SC/ST communities: NTFP Processing, Product Development and Entrepreneurship course - for the SC/ ST Communities, Dtd. 3<sup>rd</sup>-13<sup>th</sup> October 2023
- Design and Conduct of Analytical Instrumentation Internship Training Program - Dtd. 20<sup>th</sup> March 2023 to 19<sup>th</sup> June 2023; 4<sup>th</sup> September 2023 to 1<sup>st</sup> December 2023
- Design and Conduct of Training programme for Kerala Agricultural University Faculties – Dtd. 30<sup>th</sup> October 2023 to 17<sup>th</sup> November 2023
- Design and Conduct of Training programme on ‘Empowering SC/ ST communities: NTFP Processing, Product Development and Entrepreneurship’, sponsored by KSCSTE, Dtd. 3<sup>rd</sup> October 2023
- One-day workshop organized by KFD and KFRI on ‘Revisiting habitat management strategies in the context of Human Wildlife conflict’ at KFRI, Peechi Dtd. 6<sup>th</sup> October 2023
- Hands on training programme on fundamentals of GIS and Remote Sensing, at KSCSTE-KFRI, 9<sup>th</sup> -13<sup>th</sup>, October 2023.

One day training for farmers from Elamad Grama Panchayat, Kollam on vegetative propagation of plants, sponsored by ATMA 2022-2024



- Two days’ workshop on ‘Phytochemical Techniques’ conducted by CIF-JNTBGRI (16<sup>th</sup> October 2023 to 17<sup>th</sup> October 2023; 11 participants; 13<sup>th</sup> November 2023 to 14<sup>th</sup> November 2023; 8 participants)
- Two days training programme on orchid farming provided for 75 beneficiaries from Kerala on 17<sup>th</sup> & 18<sup>th</sup> October 2023.



- Field orientation programmes conducted: Five batches of BFO SR Trainees, KEPA, Thrissur, Kerala Forest Department.
- Ayurveda PG Students from Govt. Ayurveda College, Thiruvananthapuram on 17<sup>th</sup> November 2023.
- French students from the 'Ecole France Ayurveda-Gayaveda Academy' on 26<sup>th</sup> November 2023.

- Forest Range Officer's trainee batch 2022-24 of Kundal Academy of Development, Administration and Management, Maharashtra on 29<sup>th</sup> November 2023.



Five teaching faculty members, 3 Postgraduate, 115 Undergraduate students from Sushrutha Ayurvedic Medical College & Hospital, Bengaluru (SAMCH, Bengaluru) on 30<sup>th</sup> November 2023.

- Forest Range Officer's trainee batch 2023-24 of PTI, Uttarakhand Forest Training Academy, Haldwani on 13<sup>th</sup> December 2023. (2 Faculty members and 57 FRO Trainees).

### One-day road safety audit course for Kerala State Rural Roads Development Agency Engineers

NATPAC organised a one-day road safety audit course for Kerala State Rural Roads Development Agency (KSRRDA) Engineers on 24<sup>th</sup> November 2023 at GCDA Conference Hall, Jawaharlal Nehru International Stadium, Ernakulam. The inauguration of the programme was done by Shri.T.J.Vinod MLA, Kerala Legislative Assembly, Ernakulam Constituency.

### Regional Stakeholder Consultation for Policy Advocacy in Road Safety issues, Challenges and Way Forward for Kerala

A consultation workshop on 'Policy advocacy in road safety issues, challenges and way forward for Kerala' was organized by CED and CUTS International in association with KSCSTE-NATPAC at Hotel Pearl Regency, Thrissur on 8<sup>th</sup> December 2023. The official inauguration of the workshop was done by Smt. S. Ajeetha Begum IPS,

### Road Safety Training for various Target Groups



DIG of Police, Thrissur Range. Key note address was delivered by Shri. P. S. Pramoj Sanker IOFS, Additional Transport Commissioner.



Panel Discussion was conducted on the theme 'Policy Advocacy in Road Safety: Issues, Challenges and Way Forward for Kerala', moderated by Shri. T. Elangovan, Former Director, NATPAC & Former Executive Director, KRS&A. The panelists were Shri. James M. P, Deputy Transport Commissioner, Central Zone, Thrissur; Shri. Sajeev K. K, Asst. Commissioner of Police, Thrissur City; Dr. Praveenkumar V K, Surgeon, General Hospital, Thrissur, District nodal officer, Trauma care; Dr. M. V. L. R. Anjaneyulu, Professor (HAG), NIT Calicut and Prof. (Dr.) Samson Mathew, Director, NATPAC.

### Training Course for Drivers of Vehicles Carrying Dangerous and Hazardous Goods

Government of Kerala accorded sanction to KSCSTE-NATPAC for conducting 'Training Course for Drivers of Vehicles Carrying Dangerous and Hazardous Goods'. A certificate for the same is issued to participants on the completion of training and this certificate is valid for 3 years. The training intends to ensure employee's safety, reduce incidents and crashes, increase employee's skills, ensure environmental protection, preclude penalties and reduce operating costs. Two Programmes has been conducted (53 participants) during this period.

### Observance of 'World Day of Remembrance' for Road Traffic Victims - WDoR 2023

KSCSTE NATPAC, Centre for Environment and Development (CED) and CUTS International jointly observed the Remembrance Day for road accident victims on 19<sup>th</sup> November 2023, at Marine Drive, Ernakulam. The commemoration day was observed with the support of GCDA, National Safety Council and Vasan Eye Care. As part of the programme, soft policing and distribution of road safety pamphlets were carried out on the road from Subhash Park to High Court Junction with the help of NSS volunteers from various colleges in the district and the Police. A first aid and trauma care demonstration, conversation with road crash victims and a free eye check-up camp were also organized.

Program Details	Date	Venue	No. of participants
Driving school instructors training programme, organised by SC College of Engineering in association with MVD	04.10.2023	Govt. House, Kollam	210
Training on Road Safety	20.10.2023	Kerala Police Academy Thrissur	23 SHO's
Defensive driving techniques	30.10.2023	Airport, Tvpmm	50
Road Safety Training Programme for student police cadets – in connection with the 'Road Safety Year – 1st November 2023 – 31st October 2024'	02.11.2023	KSCSTE- Kerala School of Mathematics (KSoM), Kunnammangalam, Kozhikode	42
Capacity Building Program on road safety for LSGD Engineers – 2 batches	09.11.2023 10.11.2023	Matter Material Testing and Research Laboratory Pvt. Ltd. (Matter Lab), Kozhikode	54
Safe Road to School (SRS) – programme	09.11.2023	Cotton Hill School, Tvpmm	200 Students
Road Safety Training for School Teachers	23.11.2023	Government Pre-Primary Teachers Training Institute, Cotton Hill, Tvpmm	30
Traffic enforcement and traffic control devices	01.12.2023 09.12.2023	Kerala Police Academy, Thrissur	230 Women Police Constables, 8 inservice reporter officers
One day training programme on 'Road Safety and Youth Leadership - RSYLP'	27.12.2023	Vidya Academy of Science and Technology	50 NSS Volunteers

## ● GIS Day 2023

KSCSTE-NATPAC organised GIS Day 2023 celebrations featuring an expert talk by Dr. Suresh Francis, Scientist, Kerala State Remote Sensing and Environment Centre (KSREC), Thiruvananthapuram, Kerala on the topic “Mobile and Web GIS Decision Support Platforms for Evidence Based Planning and Decision Making” on 15th November 2023 at 10:30 am IST through hybrid mode. Dr. Suresh Francis delivered an enlightening talk about the various projects undertaken by KSREC, and data products created including Kerala GIS (KGIS) with GRAMAM mobile mapping application and interacted with the audience.



Corporation Kerala) Ltd. Other than lecture sessions handled by experts, the trainees were given practical experience of several techniques in plant propagation, nursery management and also exposed to commercial nurseries that multiply large number of plants.



## ● Online demo of ‘Civil site design’ for scientists, technical staff and project fellows, 30<sup>th</sup> November 2023.

- **Interaction with Prof. Dr. Vivek Tandon**, Professor of Civil Engg., University of Texas, El Paso, on the topic “Flooding potential and resilience evaluation of critical transportation infrastructure after an extreme weather event”, 7<sup>th</sup> December 2023.

## ● TransTech Talk Series

- KSCSTE-NATPAC has initiated a technical talk series entitled “TransTech Talk Series” focussing on various aspects of Transportation sector.
- The ninth talk in the series was delivered online by Er. Indranil Bose, Transport Expert - World Bank on the topic “Climate and disaster risk informed transport planning – roads and waterways” on 13<sup>th</sup> October 2023.
- The tenth talk in the series was delivered online by Dr. Deshpande, Senior Geospatial Technology manager at Dewberry, Virginia, USA on the topic “Alignment Mapping of Structural Members and Rollers in a Steel Mill using Terrestrial Lidar Point Cloud” on 20<sup>th</sup> November 2023.
- The eleventh talk in the series was delivered online by Prof. Srinivas Peeta, Professor, School of Civil and Environmental Engineering and the H. Milton Stewart School of Industrial and Systems Engineering at Georgia Institute of Technology (Georgia Tech) on the topic “Enabling Sustainable Travel in smart and Engaged Communities” on 7<sup>th</sup> December 2023.

## ● TransPedia Research Talk Series

- TransPedia is a distinctive endeavour from NATPAC, envisioned to promote research for shared benefits, by disseminating knowledge on diverse topics from cutting-edge technologies to sustainable solutions. This also brings out a platform for young researchers across the globe to connect and interact to better shape the future of research and development in transportation.
- The third talk in the series was delivered online on the topic “Revisiting proactive road safety analysis: past, present and the way forward” on 25<sup>th</sup> October 2023 by Dr. Suvin P Venthuruthiyil, Assistant Professor, Dept. of Civil Engg., IIT Hyderabad.
- The fourth talk in the series was delivered online on the topic “Developing local road AADT using Geo-spatial methods” on 29<sup>th</sup> November 2023 by Dr. Sonu Mathew, who completed his Ph.D from the University of North Carolina, at Charlotte, United States in 2020.
- The fifth talk in the series was delivered online on the topic “Resilience mapping of road networks using traffic data” on 27<sup>th</sup> December 2023 by Dr. Sriji Balakrishnan, Assistant Professor, Faculty of Technology, Policy and Management TU Delft, Netherlands.
- Skill Based Training Programme on Nursery Management & Quality Planting Material Production for SC/ST Community funded by the KSCSTE SC/ST Cell was conducted at MBGIPS during 6<sup>th</sup> to 20<sup>th</sup> October 2023. Training was imparted to 30 staff of Aralam Farming

- **ASPIRE 2023:** funded by KSCSTE- Scheduled Caste (SC) & Scheduled Tribe (ST) cell was conducted at KSCSTE-MBGIPS during 20<sup>th</sup> to 25<sup>th</sup> November 2023 with an aim to promote scientific awareness and temper among tribal students. A group of 45 students and 9 accompanying teachers from nine Model Residential Higher Secondary (MRHS) schools in the state participated in this programme. The programme included lecture sessions, field visits to KSCSTE-CWRDM, KSCSTE-KSoM, KIRTHADS, Zoological Survey of India, Regional Science Centre Planetarium, ICAR-IISR, Calicut University Botanical Garden, Kadalundi Bird sanctuary and a cultural night on the eve of valedictory Session.

- Skill Training on Plant Propagation & Nursery Management was conducted at KSCSTE-MBGIPS during 27<sup>th</sup> November to 2<sup>nd</sup> December 2023 with the participation of 30 people.

- Orientation programme for the newly appointed Junior Scientists at KSCSTE was held at MBGIPS on 18<sup>th</sup> November 2022

- Training program Conducted for the foresters of Thamarassery Forest Area regarding propagation and significance of conservation of the species *Vateria indica* and *Hopea ponga* on 13<sup>th</sup> October 2023

- SSR- SERB: Scientific Social responsibility activities conducted out at MBGIPS on 07<sup>th</sup> December 2023 for the students from the Department of Botany Sree Narayana Guru College, Chelannur.

- Organized a three-day National workshop titled “Bridging the Knowledge Gap: Workshop on the Theory of Climate Change” at RRII campus in Kottayam from 1<sup>st</sup>-3<sup>rd</sup> November 2023. The workshop included extensive hands-on sessions for the participants by experts from Institutions of national importance (IIT Madras, IISc Bangalore, NIT Warangal, IISER Trivandrum, and IMD Delhi).



- STIC conducted 2, free skill-based training programme for SC/ST category during 9<sup>th</sup> to 20<sup>th</sup> October 2023, under the sponsorship of KSCSTE and DST.



- As part of the collaborative working, an MoU has been signed by STIC with MES College, Marampilly for combined working and offering Internships / Training / short term courses and research assistance.

- STIC was the venue for the District level programme of 31<sup>st</sup> National Children’s Science Congress held on 11<sup>th</sup> November 2023 conducted by KSCSTE

- STIC participated in the RURAL INNOVATORS MEET 2023 at KFRI, Peechi during 19<sup>th</sup> - 20<sup>th</sup> December 2023



Centre for Geoinformatics, IRTC conducted Four-day hands-on training on the Fundamentals of GIS and Remote sensing for students, research scholars, and professionals (8<sup>th</sup> November to 11<sup>th</sup> November 2023). 11 participants from Kerala, Tamil Nadu, and Maharashtra attended the training program.



- MSSRF CABc celebrated Gandhi Jayanthi by engaging in a collaborative effort with APES, Midland Engineering Constructions & Vaduvanchal GHSS; NSS students planted 603 seedlings of 43 different Rare Endemic Threatened (RET) tree species alongside the Meppadi Ooty road, Wayanad.



- Celebrated World Food Day with a Seminar with enlightening sessions on Agrobiodiversity for Nutrition & Health



- Students as part of STEM learning, got practical hands-on experience & explored various components of an ecosystem through an engaging educational journey as they created their own 'ecosystem in a jar'



- Established 4 School Nutrition Gardens across Wayanad for awareness on nutrition rich agrobiodiversity



- A training & exposure visit on dairy farming was organized with the expertise of Lily, an inspiring dairy entrepreneur empowering women to lead in the field on the occasion of Women in Agriculture Day, 4<sup>th</sup> December.



- On National Farmers Day, 23<sup>rd</sup> December ; organized a learning interface between farmers & students as farmers took centre stage & shared their knowledge



- 17 Days Training program on Bamboo craft for SC & ST community of Kerala completed on 4<sup>th</sup> October 2023



# Conferences / Symposia / Seminars organised

## ● National Students Climate Conclave



- The National Students Climate Conclave, conducted during 16<sup>th</sup> -18<sup>th</sup> October, 2023 jointly with SSK had participants from all over the country, who showcased their research outputs related to climate change. The National Student Climate Conclave empowered and mobilized the youth of the nation to combat climate change actively. By raising awareness, providing education, and fostering collaboration, KSCSTE jointly with SSK created a generation of climate-conscious leaders who will drive positive change in their communities and beyond.

## ● Teacher and Student training programme-NSD

In connection with National Science Day-2023 celebrations, a series of teacher training programmes/post graduate students training programme relevant to areas of Science and Technology was conducted at following institutes of the state during October-November, 2023.

- Department of Physics, Indian Institute of Technology, Palakkad
- Department of Nanoscience and Technology, University of Calicut
- International school of photonics, Cochin University of Science and Technology
- Department of Chemistry, CMS College, Kottayam
- Department of Biotechnology and Microbiology, Kannur University

## ● Teacher and Student training programme-NMD

Two teacher professional development programs (TPDPs) and Two student skill development programs (SSDPs) in mathematical modelling, using technology-enabled and student-centred learning systems were organized in colleges and university departments across Kerala during November-December, 2023. The program designed in collaboration with Homi Bhabha Centre for Science Education (HBCSE) – Tata Institute of Fundamental Research (TIFR) and KSCSTE. The training program is to provide cutting edge training in mathematical modeling for science teachers and students alongside fostering expertise in model-based reasoning and computational thinking, using new computational media and interactive simulations.

## ● National Mathematics Day 2022-One day seminar and quiz competition

As a part of NMD Celebration, a one day programme including seminar, exhibition and Quiz competition was organized at Government College for Women, Thiruvananthapuram on 22<sup>nd</sup> December, 2023. Expert Talks were delivered by Dr. Raju K. George, Outstanding Professor, Dean



(R&D, IPR), Department of Mathematics, Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram and Dr. Manikandan Rangaswamy, Assistant Professor, Department of Mathematics, Central University of Kerala (CUK), Kasaragod. Also, an inter-collegiate quiz competition open to students pursuing mathematics from colleges in and around Trivandrum was organized. A day long exhibition by students from the Government college for Women will showcase their mathematical projects, models, and innovations. This was an opportunity for students to demonstrate the practical applications of mathematics and share their passion for the subject.



Kerala Biotechnology Commission partners with College of Agriculture, Kerala Agricultural University (KAU), Vellayani has organized an International Biotechnology Conclave “The Biotech Capstone – Science- Interface” – BIOZION during August 7<sup>th</sup> November 2023 at College of Agriculture, Vellayani, Thiruvananthapuram. The conference brought together leading researchers and students of Life Sciences and Biotechnology and provided a platform to exchange their knowledge and experience on the most relevant biotech breakthroughs.



- In connection with the 8<sup>th</sup> Ayurveda Day Celebration, a One day programme with 3 lectures, yoga session, expo on ayurveda products and a quiz competition was conducted in the Seminar Hall at KSCSTE HQs on 10<sup>th</sup> November, 2023.
- National Conference on “Reviving Wetlands” during 11<sup>th</sup> to 13<sup>th</sup>, October, 2023, at CWRDM, Kozhikode with the financial support from State Wetland Authority Kerala (SWAK), as part of the research project ‘Integrated Wetland Inventory Assessment and Monitoring System (WIAMS) of three Ramsar sites of Kerala’ and supported by Wetlands International South Asia under UNEP- Global Environment Facility (GEF)-funded Integrated Management of Wetland Biodiversity and Ecosystems Services (IMWBES)-project

Shri.K. Krishnankutty, Hon’ble Minister of Electricity, Govt. of Kerala, addressing the valedictory session of National Conference on “Reviving Wetlands”





- CWRDM organized a Workshop on “Sustainable Wetland Management” during 22<sup>nd</sup>-23<sup>rd</sup> December, 2023, at Alappuzha, with the financial support from State Wetland Authority Kerala (SWAK), as part of the research project ‘Integrated Wetland Inventory Assessment and Monitoring System (WIAMS) of three Ramsar sites of Kerala’. The second day of the Workshop was arranged as a Floating Workshop in Vembanad Lake.

- Conservation through knowledge on native medicinal plant seeds and seedlings: one day workshop was organized by Dr. Anilkumar C on 18<sup>th</sup> October 2023 at KSCSTE- JNTBGRI with the financial support of the Kerala State Biodiversity Board. Teachers and students of Government High School Jawahar Colony and Crescent Central School Peringammala as 50 participants were assembled at the Seminar Hall of the Institute’s Visitors Management Centre.

Conducted Road Safety exhibition as part of ‘Advaya 2k23’, during the 75th Anniversary Celebration of NCC, Mangalam College of Engineering, Ettumanoor, 25th November 2023.



- One day National Seminar on “Importance, scope and need of conservation of aquatic habitats” funded by Kerala Biodiversity Board was conducted at MBGIPS on 20<sup>th</sup> October 2023 with the

participation of 70 UG, PG students and research scholars from various colleges in the district. Scientific sessions were handled by Dr. V. Balakrishnan, Member Secretary, Kerala State Biodiversity Board and Dr. K.A. Sreejith, Principal Scientist, Department of Forest Ecology, KSCSTE-KFRI, Thrissur followed by field/lab visits.

- International Conference on Class Groups of Number Fields and Related Topics-2023 October 26<sup>th</sup>-30<sup>th</sup>, 2023
- Interactions in Several Complex Variables-Workshop & Conference December 19<sup>th</sup>-23<sup>th</sup>, 2022
- John Von Neumann Colloquium on “What is involved in Quantum Mechanics?” by Dr. Krishna Maddaly, Ashoka University. 8<sup>th</sup> December, 2023
- National Mathematics Day Colloquium on “The Problem of Structural Stability” by Dr. Shiva Shankar December 22, 2023
- National Mathematics Day Seminar on “Multiplication operators on Hardy space” by Dr. Anish M, IIT Bhubaneswar 22<sup>nd</sup> December, 2023

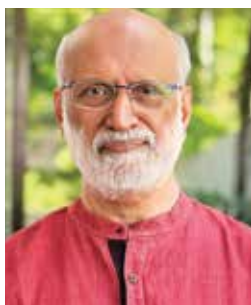


## Books/ Publications/ Reports/ Patents/ Awards/ Honours/ Recognitions

### Kerala Science Literature Awards-2022 Announced



**Saga James**



**Dr. B. Ekbal**



**CM Muraleedharan**



**Seema Sreelayam**



**P Suresh Babu**

The Science Literature Awards for the year 2022 instituted by The Kerala State Council for Science, Technology and Environment have been announced. This prestigious awards recognize the contributions made by authors in promoting Science through Science Literature in Malayalam.

The awards are conferred under five categories namely; Science Book (Children’s Literature), Science Book (Popular Science), Science Book (In-depth Science), Science Journalism Award, Science Book (Malayalam translation). Each Award carries a cash prize of Rs. 50,000/- , Plaque and Certificate.

The award for the best science book under Children’s literature - 2022 has been conferred on Smt. Saga James for the book ശാസ്ത്രമധുരം - (Sastram Madhuram). Smt. Saga is a resident of Thiruvananthapuram and is a biology teacher at St. Mary’s Government Higher Secondary School, Pattom, Thiruvananthapuram.

Renowned neuro surgeon and public health activist Dr. B Ekbal is the recipient of the award for the best book under the Popular Science Category 2022 for the book മഹാമാരികൾ: പ്ലേഗ് മുതൽ കോവിഡ് വരെ

ചരിത്രം ശാസ്ത്രം അതിജീവനം - (Mahamaarikal: Plague muthal Covid vare- Charitram. Sastram. Atijeevanam). Dr. Ekbal was the Former Vice Chancellor, University of Kerala and is presently serving as the member of the Kerala State Planning Board.

The award for the best science book under In-depth Science 2022 has been conferred on Sri. C M Muraleedharan for the book വിജ്ഞാനവും വിജ്ഞാന ഭാഷയും - (Vijnanavum Vijnana Bhashayum). Sri Muraleedharan is a resident of Kozhikode and was serving the Postal Department. Presently Sri. Muraleedharan is a scholar at SNGS College, Pattambi.

Smt. Seema Sreelayam has won the Science Journalism Award for her contributions in promoting science through science newspaper articles in 2022. Smt. Seema is a resident of Kozhikode and is a teacher at GVHSS for Girls, Nadakkavil.

The award for the best science book under the Malayalam Translation category has been conferred on Sri. P Suresh Babu for his book ശാസ്ത്രത്തിന്റെ ഉദയം (Sastrathinte Udayam). Author is serving as editor at Kerala Kaumudi, Thiruvananthapuram.



- Awarded Copyright for Rooftop Rain Water Calculator by the Copyright Office, GOI with Register Number :SW-17548/2023. (Staff Involved : 1) Er Prajith V, Scientist B, HCRG 2) Ms Shafna K P 3) Mr Prasanth S.S, TO Gr-2, Subcentre Neyyattinkara.
- KSCSTE-KFRI's Dr. Donald James (Biotechnology), Scientist-B, awarded **Indian National Science Academy (INSA) Visiting Scientist Fellowship** for IIT Madras collaboration (October 2023)
- Dr. Raju Antony, Technical Officer is honoured with 'Prof. S.S. Bir Medal in Pteridology' by The Indian Fern Society, for his excellent achievements in the field of Pteridological Research
- Dr. Anurag Dhyani selected as Member, Bamboo Phylogeny Group II, China Dr. Mathew Dan won best oral presentation award (Second position) at Conference on Spices, Aromatic and Medicinal Plants for Economic Prosperity and Ecological Sustainability-2023, organized by the Andaman Science Association at ICAR in the Central Island Agricultural Research Institute, Port Blair on 5-6 October 2023.



## Appointments/ Promotions/ Retirements



- **KSCSTE HQ**  
Smt. Chandri PC, Clerical Assistant retired from service on 31<sup>st</sup> July 2023
- **CWRDM**  
Sri. Usman P, Clerical Assistant retired from service on 31<sup>st</sup> December 2023
- **CWRDM**  
Shri Mahadev MG joined as registrar of CWRDM on 1<sup>st</sup> November 2023

- **KFRI**  
Dr. Mohammed Kunhi, Principal Scientist, retired from service on 30<sup>th</sup> November 2023.
- Sri. Mohandas V.K., Office Attendant Gr. IV retired from service on 30<sup>th</sup> November 2023.
- **JNTBGRI**  
Dr. Mathew Dan, Principal Scientist and Head retired from service on 30<sup>th</sup> November 2023.



## Special News

- **CWRDM**  
CWRDM signed an MoU with Organization for Industrial Social and Cultural Advancement (OISCA) International for analytical collaboration to conduct the Green Audit for schools and colleges by empaneling by MoEF&CC  
A new scientific library facility at CWRDM sub centre Neyyattinkara was completed.
- **KFRI**  
GAIL India Joins Hands with KFRI to Develop Sustainable Root

Trainers for Forests: First CSR Initiative for KFRI Focuses on Eliminating Plastic (Funding by GAIL India)

Kerala Forest Research Institute (KFRI) joins the esteemed Global Mangrove Alliance (GMA), a multi-stakeholder platform driving comprehensive, coordinated global action for mangrove conservation and restoration.

30,509 seedlings of 15 IUCN Red List species are ready for planting under the Green Kerala Initiative.

- A remarkable little known edible mushroom that sprouts in areca nut husks were collected from Palode and identified as *Coprinopsis cinerea*. This mushroom that grows naturally on areca nut husks, have been used by the Rajapur Saraswat Brahmin families since long but the information remains with them only. In a significant breakthrough, researchers from the Jawaharlal Nehru Tropical Botanic Garden and Research



Institute (JNTBGRI) have successfully cultivated this mushroom, sprouting in the husks of areca nuts. This mushroom species, previously reported in the border districts of Kerala and Karnataka, has now been confirmed to flourish in the areca nut husks, opening possibilities for artificial mushroom cultivation in various substrates including areca nut husks and paddy straw. The discovery of *Coprinopsis cinerea* thriving in abandoned areca nut husks not only adds a new dimension to mushroom cultivation but also presents an innovative approach to managing agricultural waste. As researchers delve deeper into the potential applications of this discovery, the implications for sustainable farming and waste utilization are vast and promising.



- An open house programme was conducted in JNTBGRI on 21st December 2023 in connection with Navakerala Sadhass at Vamanapuram Legislative constituency. Publics were freely allowed to visit the major areas of the Garden. More than 300 peoples visited the Medicinal Garden and Orchidarium
- A Spice Corner was started at the eastern side of the Medicinal Garden with plants used as spice in Kerala cuisines. The Spice Corner was formally inaugurated by Dr S Pradeep Kumar, Director, JNTBGRI by planting a sapling of *Tamarindus indicus* on 8<sup>th</sup>.November.2023.
- KSCSTE Regional Rural Innovators meet (RRIM) 2023 for Kasaragod-Kannur-Kozhikode-Wayanad region was conducted at MBGIPS on 30th November 2023 with the participation of 7 innovators.



## Remarkable/ Outstanding achievements

### ● MBGIPS

Dr. Joachim Gratsfield (Regional Program Director, BGCI) Co-ordinator for the BGCI program at KSCSTE-MBGIPS visited MBGIPS during 20th to 23rd October 2023.



### ● Centre of Excellence in Microbiome (CoEM)

The Centre of Excellence in Microbiome (CoEM), under the aegis of Kerala State Council for Science, Technology and Environment (KSCSTE) and Kerala Development and Innovation Strategic Council (K-DISC) with the scientific mentoring of Rajiv Gandhi Centre for Biotechnology (DBT-RGCB), is a new initiative of the Govt. of Kerala. A tripartite MoU has been signed by the partnering Institutes. It envisages performing scientific research and catalysing microbiome-mediated interventions in One Health perspective across the major domains- human, agriculture, veterinary, aquatic and environment. It shall leverage the cutting-edge multi-omics technologies such as culturomics, genomics, proteomics, metabolomics, bioinformatics and data analytics to advance discoveries in microbiome science across various disciplines to tackle societal challenges. It also aims to support and promote start-ups focused on microbiome associated products. The CoEM initiated at RGCB-KINFRA campus, Kazhakkootam will be established at Bio360 Life Science Park, Thonnakkal, Trivandrum.

36 <sup>th</sup> Kerala Science Congress		
A glimpses of the Event (8-11 February 2024)		
8 <sup>th</sup> Feb	11 AM	Inauguration of National EXPO
9 <sup>th</sup> Feb	10:00 AM	Inauguration of 36 Kerala Science Congress by Hon'ble Chief Minister
	11:30 AM	Lecture by Nobel Laureate Prof. Morten Meldal
	12:15 PM	Focal Theme Lectures by Dr. B. Ekbal, Public Health Activist, Former Vice Chancellor, University of Kerala and Prof. Mathew George Central University, Kerala
	02:30 PM	MS Swaminathan Memorial Lecture by Dr. Swati Nayak, Indian Rice Research Institute, New Delhi
	03:30 PM	Kerala State Young Scientist Awardees Presentation
	04:30 PM	Technical Poster Presentations
	06:30 PM	Cultural Programme
10 <sup>th</sup> Feb	09:00 AM	E.K. Janaki Ammal Memorial Lecture by Dr. A.A. Mao, Director, Botanical Survey of India
	10:00 AM	Technical Paper Presentations
	02:30 PM	SciSol Presentations
	04:00 PM	P.T. Bhaskara Panicker Memorial Lecture by Shri. K. Jayakumar, Director, Institute of Management in Government and Former Vice Chancellor, Malayalam University
	04:45 PM	Sessions for Start-ups and innovators
	06:30 PM	Cultural Programme
11 <sup>th</sup> Feb	07:30 AM	Walk-with Scientist
	09:00 AM	P.K. Gopalakrishnan Memorial Lecture by Prof. K.J. Joseph, Director, Gulati Institute of Finance and Taxation (GIFT), Thiruvananthapuram
	10:00 AM	Children's Science Congress
	10:30 AM	P.G. Students Interaction
	02:30 PM	Valedictory Function
KSCSTE		



**KERALA STATE COUNCIL FOR  
SCIENCE, TECHNOLOGY AND ENVIRONMENT (KSCSTE)**  
കേരള ശാസ്ത്ര സാങ്കേതിക പരിസ്ഥിതി കൗൺസിൽ

An Autonomous Institution of Science &  
Technology Department, Government of Kerala  
Sasthra Bhavan, Pattom, Thiruvananthapuram,  
Kerala 695004 + 91-471-2548200 email: kscste@kerala.gov.in  
www.kscste.kerala.gov.in  
<https://www.youtube.com/c/KSCSTEofficial>

