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EnSuRe 2023

(**En**vironmental **Su**stainability **@ Re**ach)

eMagazine Volume 1

Directorate of Research

SRM Institute of Science and Technology

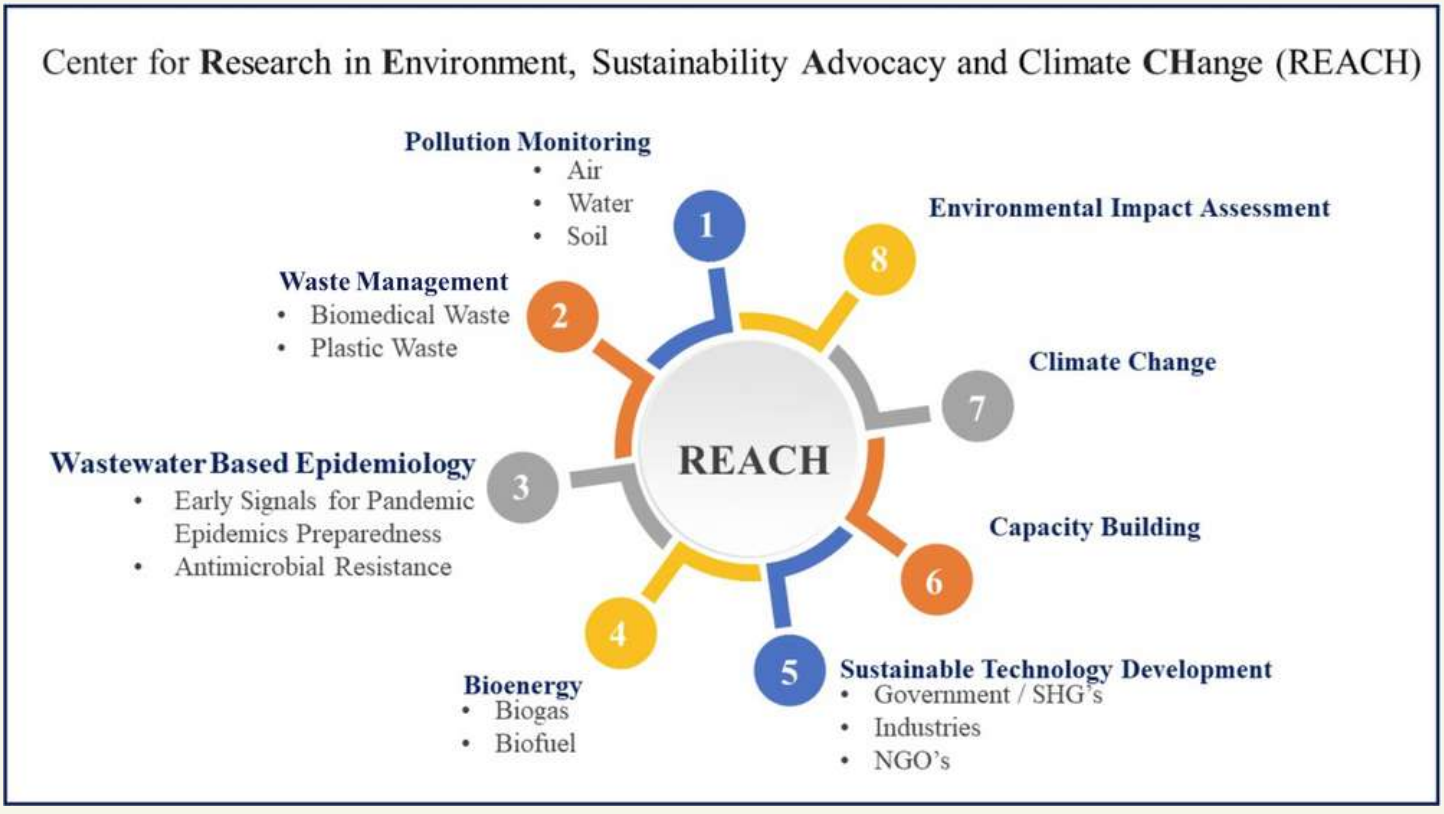
Contents

VISION

- **The Centre for Research in Environment, Sustainability Advocacy and Climate Change (REACH), Directorate of Research, SRMIST** shall operate in the domains of Environment, Sustainability Development, Advocacy and Climate Change.
- The centre shall aim to ensure the optimal and effective use of intellectual, financial and physical resources to foster an environment of research excellence throughout the University.
- Collaborations with leading companies, other universities, the public sector and institutes are an important function of the centre
- The centre shall serve as a meeting place for academia, industry and other societal organizations.

MISSION

- To make significant contributions to teaching, research, outreach and capacity building to solve increasingly complex problems facilitated by interdisciplinary approaches
- Lead, integrate, and deliver multidisciplinary research and value-driven, real-world solutions in domains of environment, sustainability, advocacy and climate change
- Provide expert services and consulting to research, educational and executive centers in various domains
- Publication of periodical scientific journals, articles, books and specialized journals, bulletins and technical policy reports in related fields
- Provide laboratory services with international quality; and contribute to humanity



Prof. C. Muthamizhchelvan, Ph.D
Vice Chancellor

SRM
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MESSAGE

In today's world, the pursuit of sustainability is not a choice. As global citizens, it is imperative to safeguard our planet for future generations. At SRM Institute of Science and Technology, we recognize the critical importance of sustainability, and in all aspects of our academic, research, and operational endeavors we make cautious choices and decisions. From cutting-edge research in renewable energy and environmental conservation to campus-wide sustainability initiatives, SRMIST is at the forefront, driving positive change. Whether it is through our curriculum, community engagement programs, or campus infrastructure development, sustainability remains a guiding principle embedded in everything we do.

As we embark on this journey towards a more sustainable future, let us remember that we all have a role to play. By fostering a culture of sustainability within our institution and beyond, we can collectively make a significant impact on the world. I am sure this magazine will serve as a platform to showcase our commitment to sustainability and also highlight the innovative initiatives undertaken by SRMIST. I hope this magazine inspires and empowers everyone to take up the mission of creating a more sustainable future for all.

23/2/24

Prof. C. Muthamizhchelvan
VICE CHANCELLOR
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MESSAGE FROM THE DEAN RESEARCH

Dear Readers,

Welcome to 1st edition of the e-magazine **EnSuRe** dedicated to exploring innovative solutions and fostering a collective spirit of action toward environmental sustainability. Climate change, biodiversity loss, and resource depletion threaten the very fabric of life on Earth. These issues are complex and interconnected, demanding a multifaceted approach.

Environmental sustainability is not just a scientific pursuit; it's a collective responsibility. Our commitment to environmental stewardship extends beyond research. Here at SRM Institute of Science and Technology, we are fostering collaboration across disciplines, encouraging student engagement in environmental initiatives, and working towards a more sustainable campus environment.

This magazine showcases some of the cutting-edge research on water and air pollutants, epidemiology, circular economy, and pollution mitigation strategies. The magazine also delves into the social and economic dimensions of sustainability, highlighting projects that promote community engagement, environmental justice, and the development of a circular economy.

I encourage you to delve into the insights of this magazine to ignite your curiosity, spark your compassion, and motivate you to become an active participant in shaping a sustainable future. Together, through research, education, and action, we can build a brighter future for generations to come.

Together, we can make a difference.

Prof. B. Neppolian
Dean – Research, SRMIST

MESSAGE FROM THE CENTRE HEAD

Dear Reader,

As we reflect on the year 2023, I am filled with gratitude and pride for the remarkable strides we have taken together in advancing our aims at the Centre.

Throughout the past year, our research initiatives have unearthed invaluable insights into the intricate web of environmental issues, paving the way for innovative solutions. We are ensuring societal health through our diverse projects and also contributed to the global conversation. In the coming year, let us build upon the foundation we've laid, fostering even greater collaboration and innovation.

Thank you for your continued commitment to the vision of REACH. May the year ahead be filled with renewed determination, meaningful partnerships, and impactful accomplishments.

Wishing you all a prosperous and sustainable 2024.

Yours sincerely,

Prof. Paromita Chakraborty

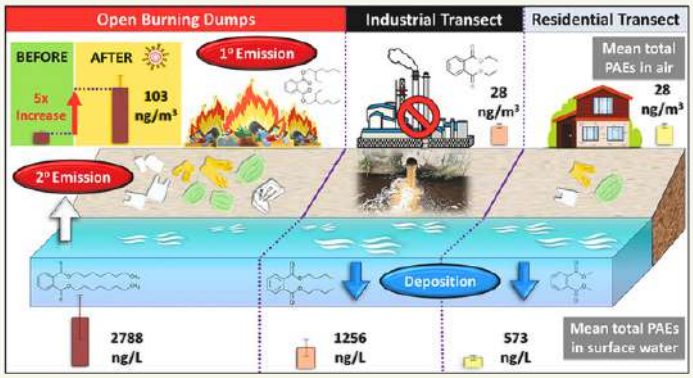
OFFICE OF THE REACH
SRM IST
DIRECTORATE OF RESEARCH

Technical Research Highlights of 2023

Chemosphere

Impact Factor: **8.8**

Title: Air-water exchange and risk assessment of phthalic acid esters during the early phase of COVID-19 pandemic in tropical riverine catchments of India

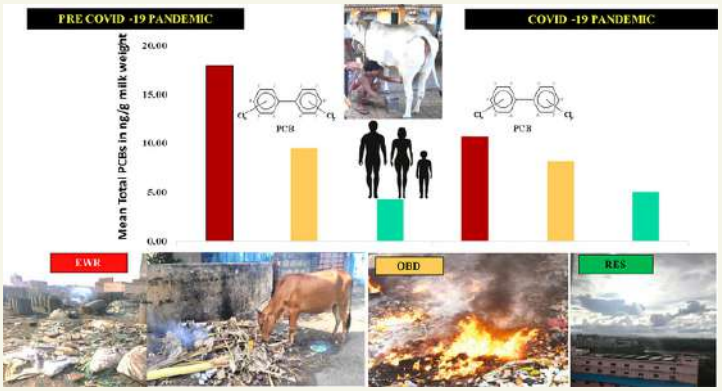


- In tropical riverine catchments, the open burning transect had the highest air and water PAE levels, followed by industrial and residential.
- Chennai had twice the mean atmospheric PAE of Vapi due to 100% oceanic air masses from the Bay of Bengal and Indian Ocean.
- DnBP caused most estrogenicity in CSW and DG and posed the greatest harm to tropical river fishes in the open fire transect.

Science of The Total Environment

Impact Factor: **9.8**

Title: Polychlorinated biphenyls in bovine milk from a typical informal electronic waste recycling and related source regions in southern India before and after the COVID-19 pandemic outbreak



- PCBs in bovine milk in Chennai decreased along EWR > OBD > RES transects.
- After the pandemic, PCB-52 levels in the OBD transect increased significantly.
- The highest average daily dose (ADD) exposure risk was found in EWR children, significantly greater ($p < 0.05$) than other transects.

Chemical Engineering Journal

Impact Factor: **15.1**

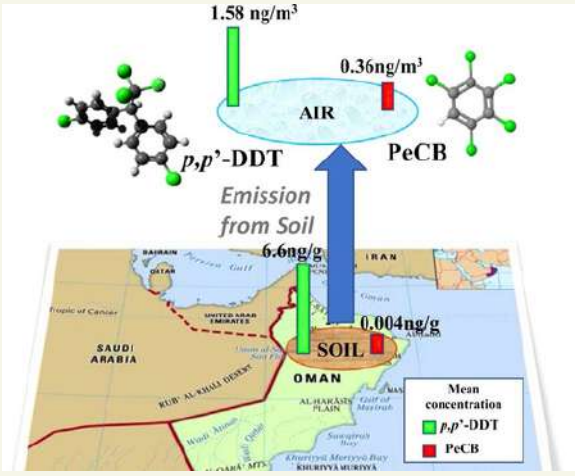
Title: Green circular economy of co-gasification with municipal solid waste and wood waste in a novel downdraft gasifier with rotating grate

- ·Gasification for MSW conversion prevents disposal and pollution.
- ·Modified downdraft gasifier achieved cold gas efficiency of 85.6%.
- ·Mass and energy balance demonstrated that the entire process was potentially feasible

Journal of Hazardous Materials

Impact Factor: **13.6**

Title: New and legacy pesticidal persistent organic pollutants in the agricultural region of the Sultanate of Oman



- Comprehensive air and surface soil monitoring was conducted for new and legacy organochlorine pesticides (OCPs) in the Sultanate of Oman.
- Major OCP isomers and metabolites showed net volatilisation from the agricultural soil, indicating concurrent emission and re-emission processes from the soil of Oman.
- The cleansing effect of oceanic air mass is the possible reason for relatively lower atmospheric OCP levels

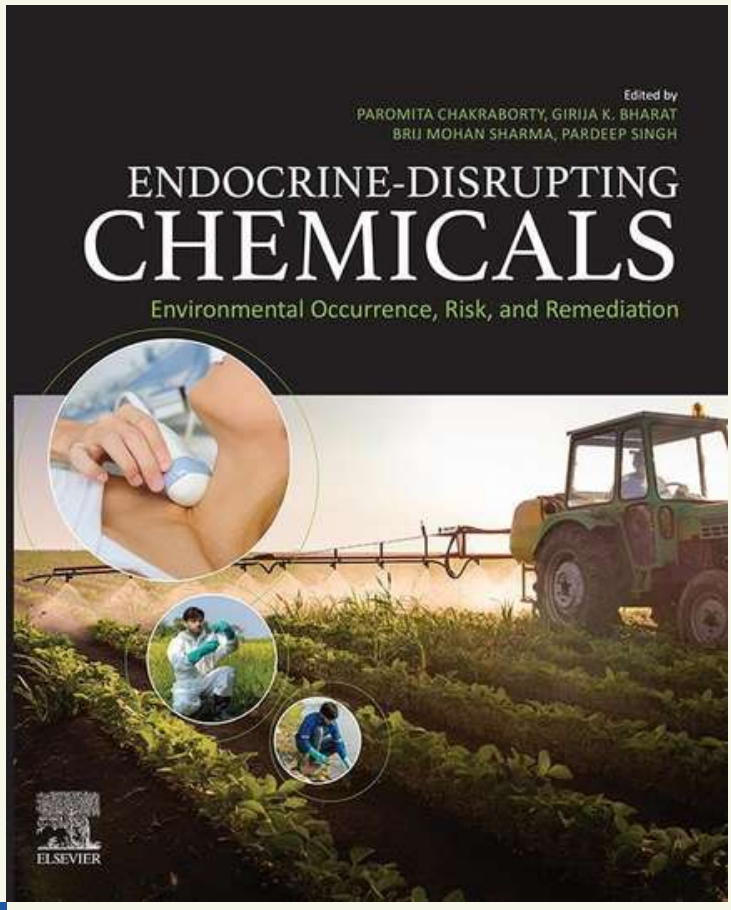
Books

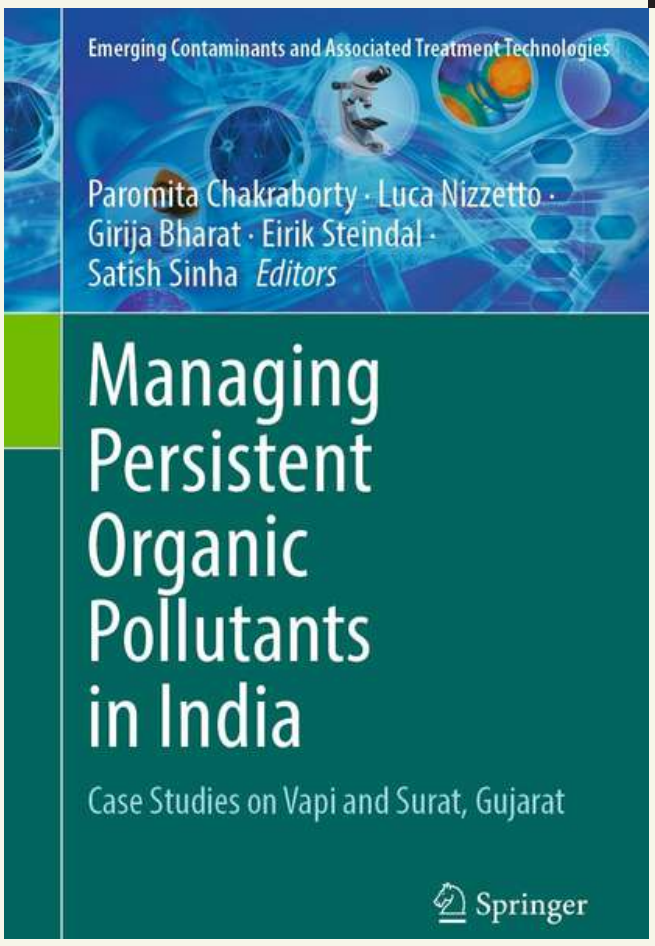
Title: Endocrine-Disrupting Chemicals: Environmental Occurrence, Risk, and Remediation

Editors: Paromita Chakraborty*, Girija K. Bharat, Brij Mohan Sharma, Pardeep Singh

Publisher: Elsevier Science

Paromita Chakraborty* - Corresponding Editor





Title: Managing Persistent Organic Pollutants in India: Case Studies on Vapi and Surat, Gujarat

Editors: Paromita Chakraborty*, Luca Nizzetto, Girija Bharat, Eirik Steindal, Satish Sinha

Doi: https://doi.org/10.1007/978-3-031-31311-0

Publisher: Springer Cham

Paromita Chakraborty* - Corresponding Editor

The International Workshop on Action for Rivers

On March 14, 2023, the Centre for Research in Environment, Sustainability Advocacy, and Climate Change (**REACH**), Directorate of Research, SRMIST organized the "**International Workshop on Action for Rivers**" under the theme "**Save Rivers for Safe Water**."

The occasion was honored by the attendance of **Ms. Marit Marie Strand**, Counsellor at the Norwegian Embassy in New Delhi, serving as the Chief Guest, and **Mr. Jeyannathann Karunanithi**, India Regional Operations Manager at the International Water Association, who graced the event as the Guest of Honour. **Dr. S. Ponnusamy**, Registrar at SRMIST, presided over the proceedings, and the esteemed **Prof. B. Neppolian**, Dean (Research).

Prof. Paromita Chakraborty, Head of REACH delivered the welcome address followed by a brief video highlighting the outreach initiative to clean a segment of the **Adyar River bank**. Session 1 reached its culmination with the unveiling SRMIST's Water Policy by **Dr. S. Ponnusamy.**

Ms. Marit Strand emphasized the significance of water conservation to students and research scholars, drawing on live examples from Oslo, Norway. **Mr. Jeyannathann Karunanithi** enlightened the young audience about the opportunities presented by the International Water Association and its Indian Chapter. The session reached its conclusion by the distribution of prizes, recognizing the best-performing team in the River Clean-Up Initiative, and honoring exhibits showcasing the most innovative ideas.

Dr. S. Ponnusamy, Registrar released the Water Policy of SRMIST on 14.03.2023 at Ramanujan Hall, Techpark, SRMIST, Kattankulathur Campus.

The Earth Day

To commemorate Earth Day , **Prof. Paromita Chakraborty**, Head of REACH, Directorate of Research, SRMIST, organized an online webinar on the 22nd of April 2023. 54 participants from diverse backgrounds across the globe attended the webinar.

Dr. Yogesh Tiwari – A renowned Scientist at the Indian Institute of Tropical Meteorology, captivated the audience with his in-depth analysis of climate change trends, extreme weather events, and the implications for our planet's future. **Dr. Subrat Sharma** – An esteemed Scientist from GB Pant University shared valuable insights into the government's environmental policies and initiatives, emphasizing the importance of collaborative efforts in safeguarding our environment. Dr. Refiloe Mofokeng, Stellenbosch University, enlightened attendees on the global plastic waste crisis and presented innovative solutions for tackling this issue.

In conclusion, **Prof. Paromita Chakraborty**, event convenor, remarked "We are thrilled with the overwhelming response to our environmental webinar.

The World Environment Day

World Environment Day was celebrated annually on 5th of June. In 2023, "**Solution to Plastic Pollution**" was the theme under the campaign **#Beat the Plastic Pollution. The World Environmental day** in SRMIST, Kattankulathur campus was celebrated as a week-long activity (May 31st to June 5th, 2023). It was organized by the Centre for Research in Environment, Sustainability Advocacy and Climate Change (**REACH**), Directorate of Research in association with the School of **Public Health, Medical College, College of Agricultural Sciences, School of Hotel Management, UHV, NSS, and School of Pharmacy** demonstrating and utilizing SRM IST's interdisciplinary expertise by working together for a clear outcome. Around 500 students participated in different events.

Unveiling the 'Plastic Pollution Prevention Policy' of SRMIST at Mini hall -1 , Dr. T. P. Ganesan Auditorium, SRMIST

Day 1 (May 31, 2023) was initiated with a spirited rally adorned with banners, placards, and eco-friendly props aiming to raise awareness about environmental challenges and inspire positive change in our community.

Flagging off the Rally on 31.05.23 from SRM Medical College

Students actively taking part in the rally

Students receiving certificates for participating in the rally

On the second day morning, the whole community gathered at **Vattambakkam village**, **Chengalpattu** for the tree plantation event. The event wasn't just about planting trees; it was also an opportunity to educate our community about the importance of trees in our ecosystem.

Tree plantation drive on the occasion of World Environment Day on 01.06.23 at Vattambakkam village, Chengalpattu.

Day 3 started with an awareness program to SRMIST workers about how to segregate waste into categories such as recyclables, non-recyclables, organic, and hazardous waste. These interactive sessions helped dispel any doubts and ensured that the participants could confidently segregate waste in their daily routines.

Waste awareness program for the campus labor and workers held on 02.06.23 at Prof. G. N. Ramachandran Hall, Bio engineering block, SRMIST

Physiotherapy workshop was conducted to bring awareness to the campus maintenance staffs about the importance of performing exercises on regular basis to avoid traumatic injuries and keep them healthy.

Physiotherapy workshop conducted to Campus maintenance and security staff on 02.06.23 at Prof. G. N. Ramachandran Hall, Bio engineering block, SRMIST

On day 4, events like (I) Nurturing Young Chefs (Fireless cooking) (II) Crafting a Greener Future (terracotta clay jewelry making) (III) Sowing the Seeds of Change (seed ball making) and (IV) Bringing Nature to the Workplace (Cabin Gardening Workshop) were conducted in house to motivate young brains. School children were the main participants in the events and they enjoyed all the activities; their enthusiasm made the events a grand success.

Faculty from the School of Hotel Management demonstrating fireless cooking techniques

Children at the fireless cooking workshop held on 03.06.23 at Prof. Peter Drucker Hall, SRMIST

Dr. Supraja demonstrating terracotta clay jeweler making

Children at the terracotta clay jewelry workshop

Children at the seed ball making workshop

Children at the cabin gardening workshop

Student winners with their prizes and certificates from various events of World Environmetnal Day 2023

This World Environment Day, we celebrated not only the beauty of our planet but also the potential for positive change within our workplace culture. By integrating plants into our office spaces, we are sowing the seeds for a healthier and more sustainable work environment. A total of 72 winners were selected from all the events conducted and they were all awarded certificates and prizes to encourage their efforts.

On the final day of the event, presentations were delivered by renowned eminent scientists. World Environment Day is not just a single day of celebration but a reminder of our ongoing responsibility to protect and preserve the planet for future generations.

INOPOL (Phase II) Kick-Off Event

The eagerly awaited kick-off meeting for Phase II of the India-Norway Cooperation Project on Capacity Building for Reducing Plastic and Chemical Pollution in India (**INOPOL**) was held on the 9th of June 2023 at SRMIST with resounding success.

Dignitaries from India and Norway assembled for INOPOL (Phase II) program

Ms. Beate Langset, Counsellor for Climate and Environment - Norwegian Embassy and Prof. Shishir Sinha - Director General (CIPET), addressing the gathering on 09.06.2023 at Mini Hall 1, Dr. T. P. Ganesan Auditorium, SRMIST

INOPOL Phase II represents a remarkable collaboration between India and Norway, bringing together expertise, resources, and innovative solutions to combat plastic and chemical pollution in India. The stakeholder meeting, a crucial component of INOPOL Phase II, served as a platform to align their goals, share insights, and chart a collective path toward a cleaner and healthier environment.

The agenda included a warm welcome from **Dr. Marianne Olsen**, Research Director at NIVA, setting the tone for international collaboration in addressing environmental challenges.

Dr. Hans Nicolai Adam and **Dr. Girija Bharat** provided an in-depth project overview, emphasizing its potential for positive change.

Ms. Beate Langset, **Prof. Shishir Sinha**, and **Dr. Atul Bagai** delivered inspirational keynote addresses. They highlighted the urgency of addressing pollution and the transformative potential of collaboration.

Interactive discussion about the "INOPOL (Phase II)" activities with India and Norway Scientists held on 09.06.2023 at SRMIST - Kattankulathur campus

Stakeholder Workshop on Environmental Surveillance

On August 5th, 2023, a half-day stakeholder workshop was conducted in Trivandrum as part of the wastewater surveillance project for determining the viral load of **SARS-CoV-2** in Trivandrum city's sewage. The project is currently being implemented by the **REACH, Directorate of Research**, Chennai. The workshop was inaugurated by the chief guest, **Shri M G Rajamanickam IAS**, Principal Director- Local Self Government Department, Government of Kerala.

Submission of project report on wastewater surveillance of SARS-CoV-2 in Trivandrum during the stakeholder workshop held on 05. 08. 2023 at Trivandrum

Shri M G Rajamanickam IAS, Principal Director, Local Self Government Department, Govt. of Kerala delivering his views

Stakeholders that attended the event include executives and officials from Thiruvananthapuram City Corporation, Kerala Water Authority and Suchitwa Mission as well as Swasti – Health Catalyst, project partner. The event concluded with an open forum discussion between the representatives from the stakeholders and the audience in which it was decided to take up an antimicrobial resistance study in Trivandrum with the necessary approvals.

Participants in the stakeholder workshop conducted at Trivandrum 05.08.2023

U75 Net-Zero Workshop

SRM Institute of Science and Technology in collaboration with Green Terre Foundation hosted the **U75: Net Zero University Campus Regional Workshop** to sketch the roadmap for actions towards carbon neutrality on 25th September 2023. The chief guest of the event was Honourable **MP Shri. Prakash Javadekar**, Former Minister of MoEFCC, MHRD and M(I&B). The event began with a warm welcome from **Prof. C. Muthamizhchelvan**, Vice Chancellor of SRM Institute of Science and Technology.

Hon. Member of Parliament Shri. Prakash Javadekar being felicitated during the inaugural ceremony of the U75 Net-Zero Workshop held on 25. 09. 2023 at Mini Hall -1, Dr. T. P. Ganesan Auditorium, SRMIST

In his welcome address, the Vice Chancellor spoke at length about the ill effects of extensive exploitation of nature and how climate change has affected harmony in nature. SRMIST has constituted a Centre for excellence by the name of 'Centre for Research in Environment, Sustainability Advocacy and Climate Change (REACH)' for the very reason of tackling the multitude of environmental problems plaguing humanity. He also highlighted the 4500+ publications in the SDG-UN sector which is an important issue in the present time.

Prof. C. Muthamizhchelvan, Vice Chancellor of SRMIST briefing the audience on SRMIST's efforts towards achieving carbon neutrality in all campuses

Following his welcome address, the context and background overview were elaborated by **Dr. Rajendra Shende**, Founder Director of Green TERRE Foundation and former Director of UNEP. He suggested that campuses be considered as 'living laboratories' and that all efforts to minimize emissions and achieve net zero needed to be digitized.

The keynote speaker **Hon. Prakash Javadekar, MP**, lauded the universities in Tamil Nadu & Kerala that came together to discuss the roadmap for becoming carbon neutral. It is the need of the hour to support such initiatives and I welcome SRMIST for hosting the workshop which will create the workshop leading to carbon neutrality in these 75 universities."

Hon. MP Shri. Prakash Javadekar delivering the Chief Guest's Address briefing about the carbon neutrality

Participants from all esteemed institutions like **UNESCO, the National Educational Technology Forum (NETF), the National Board of Accreditation (NBA), the Ministry of Energy, research institutes, UNDP-UNEP, TERRE Foundation, the National Institute of Advanced Studies and the Founder of Safar India, Energy Efficiency Services Ltd, Ministry of Energy, Council for GEM-Green Building Certification Programme** were joined and placed their overview about "Net-Zero" movement.

A highlight of the event was the speech, delivered online, by **Erik Solheim**. former Under Secretary General of the United Nations and former Environment Minister of Norway. His inspiring words on "**Global Youth for Net Zero**" struck a resonant chord, emphasizing the pivotal role of the youth in driving sustainability efforts worldwide.

Erik Solheim. former Under Secretary General-UN, former Environment Minister of Norway during his virtual address

Finally, a talk on "**Environmental Management System & Climate Change Actions**" was delivered by **Dr. S. Gopinath**, Asst. Professor and Management Representative of ISO 14001:2015 at SRMIST.

The workshop featured interactive sessions and expert insights on open access data for net-zero campuses, accreditation criteria, technologies for net-zero campuses, digital tools for measuring GHG emissions, energy efficiency, renewable energy, green building case studies, and much more.

A moderated Q&A session engaged students and faculty, allowing for meaningful dialogue and shared perspectives.

Q&A session engaged to students and faculty on Net-Zero concept

Indo-German Workshop on Ecotoxicology

Two-Days Indo-German joint Workshop on "**Dive into Ecotoxicology: Zebrafish and Wastewater**" organized hosted by the Indian Institute of Technology (IIT) Madras, and SRM Institute of Science and Technology, SRMIST, Kattankulathur, Chennai, on 27th and 28th November 2023. The workshop features a line-up of distinguished speakers, each unravelling crucial facets of ecotoxicology.

Participants from "Dive into Ecotoxicology: Zebrafish and Wastewater" workshop hosted by IIT Madras and SRMIST held on 27th and 28th November 2023 at SRMIST Kattankulathur campus

Session 1 started with the demo on plastic additive analysis in water samples, Extraction, and Exposure to the Cell lines lectures given by **Dr. Paromita Chakraborty** & her Ph.D. Scholars at REACH, Directorate of Research, SRMIST.

Column clean-up of organic pollutants

Microwave extraction of organic pollutants

Zebrafish exposure studies, Analysis of Developmental deformities, Measurement of Heart rate, and Behaviour Assay Technique lectures were given by Dr. S. Bharathi, Dr. R. Vasantharekha & Ph.D. Scholars from the Department of Biotechnology, SRMIST.

Dissection of Zebra Fish

In vitro assays, FACS Analysis, and CLSM Imaging studies by Dr. M.R. Ganesh & Ph. D Scholars, Interdisciplinary Institute of Indian System of Medicine (IIISM), SRMIST. Venue - 5th floor, Sir C. V. Raman Research Park, SRMIST.

Key moments from the workshop

The workshop encompassed exploring advanced ecotoxicological methodologies, understanding the role of model organisms like zebrafish, and evaluating the environmental impact of industrial processes. Participants were imparted with technical insights, diverse perspectives, and cutting-edge research convergence, promising a deeper understanding of ecotoxicology's pivotal role in shaping a sustainable future.

In her closing speech of the workshop Core convener **Prof. Indumathi Nambi, IITM** spoke about the necessity for having an understanding of the toxic nature of new and emerging chemicals and how such toxicity assessments should go hand in hand during environmental risk mitigation.

Prof. Anbumani, Scientist, CSIR-IITR being felicitated at the workshop by the convenors

GEX Kerala 23 Expo

The state government of Kerala hosted the GEX Kerala' 23 (**Global Expo on Waste Management Technologies**) in Ernakulam from February 4 to 6, 2023.

In this prestigious event, **REACH**, SRMIST and IIT Palakkad Technology IHub Foundation (IPTIF) Technology IHub Foundation collaborated to set up a stall showcasing current research ideas, patented products made from plastic waste, and ideas for stakeholders to invest in start-up funds.

Prof. Paromita Chakraborty, Head of REACH, was invited as an expert speaker and she delivered a talk entitled " Need for wastewater surveillance for future waves of pandemic and antimicrobial resistance". Prof. Paromita Chakraborty highlighted the collaboration with Suchitwa Kerala Mission Kerala and appreciated the support provided by Swasti Health Catalyst.

Prof. Paromita Chakraborty and her team actively participated in the GEX Kerala 23 Expo held during 04.02.2023 to 06.02.2023 in Ernakulam

Recommerce Expo

The commendable community outreach initiative received the prestigious "**Best Awareness Campaign Award**" at the Recommerce Expo, held in Bangalore on August 10, 2023. The award was presented by the Honorable Justice Shri. Subash Adi, Chairman of the State Level Committee of the National Green Tribunal in Karnataka.

Additionally, REACH, Direcotorate of Research, SRMIST actively engaged in the Roundtable at the Expo, where interactions took place with the Honorable Minister of State for IT & BT, Rural Development, and Panchayati Raj, Shri. Priyank Kharge.

Roundtable at the Recommerce Expo held on 10.08.2023 in Bangalore in the presence of Honorable Minister of State for IT & BT, Rural Development, and Panchayati Raj, Shri. Priyank Kharge.

INOPOL (Phase II) Training for Sampling and Processing

As part of the India-Norway cooperation project, INOPOL (Phase II), a training program on microplastics and persistent organic pollutants (POPs) sampling techniques was conducted.

The program, led by international experts from the **Norwegian Institute of Water Research (NIVA)** in collaboration with Indian institutions including SRM Institute of Science and Technology-SRMIST, Mu Gamma, CIPET, and Toxics Link, spanned two days.

The first part occurred at Kaveri River in Melasinthamani, Trichy, on 16.09.2023, while the second took place at Potheri Lake in Kattankulathur, Chengalpattu, on 19.09.2023.

45 participants from various institutions, both governmental and non-governmental attended the training included on-site instruction in sampling techniques and microplastics analysis, led by experts Rachel Hurley and Vilde Kloster Snekkevik from NIVA.

Hands-on training for water and sediment sampling held on 16.09.2023 at Kaveri River in Melasinthamani, Trichy.

Prof. Paromita Chakraborty from SRMIST and **Dr. Sissel Brit Ranneklev**, a NIVA scientist, provided training on persistent organic pollutants. Following the training, experts presented monitoring and analytical procedures for microplastics and POPs, followed by an open discussion and Q&A session with the participants.

Hands-on training for water and sediment sampling held on 19.09.2023 at Potheri Lake in Kattankulathur, Chengalpattu

The main aims of this training program were: (I) to train the scientists from government and non-governmental agencies such as TNPCB, NCCR, CIPET, Mu Gamma, Tamil Nadu Green Climate company and students from SRM institute of science and Technology and (II) to develop monitoring and data collection capacity, supporting the implementation of current policies, assessing local gaps and hurdles, identifying opportunities associated with implementation, and promoting science-based advice to local and national government bodies. Participants were pleased with the informative and well-organized training. More future interactions on POPs were desired.

Tamil Nadu Pollution Control Board research and scientific personnel attended the field visits alongwith training sessions

Scientist from Tamil Nadu Pollution Control Board being awarded the certificate of training

Sharing INOPOL Reports from Gujarat Case Studies with Supriya Sahu IAS

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2nd International Conference on

HIGHER EDUCATION INSTITUTES' CHALLENGES & SOLUTIONS FOR SUSTAINABLE DEVELOPMENT GOALS '23

1st - 3rd November 2023

SUSTAINABLE DEVELOPMENT GOALS 2023
LEARN. LEAP. LEAD
SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

GOALS FOR A BETTER WORLD

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

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Members, Convenors and Co-convenors of 2nd ICSDG Conference from various departments of SRMIST

2nd International Conference on Higher Education Institutes' Challenges & Solutions for Sustainable Development Goals 2023

The 2nd International Conference on Higher Education Institute's Challenges & Solutions for Sustainable Development Goals 2023 (ICSDG 2023) unfolded from November 1st to November 3rd at the esteemed Dr. T. P. Ganesan Auditorium. It was a momentous event aimed at addressing the agenda of all 17 SDGs.

The esteemed Chief Guest, **Ms May-Elin Stener**, Norway's Ambassador-Designate, graced the event, emphasized that blue economy was a major draw for both India and Norway to collaborate. "Norway works closely with Indian partners via key initiatives including INOPOL project to combat plastic menace and the looming threat of persistent organic pollutants"

Inaugural address delivered by Chief Guest Ms. May-Elin Stener, Ambassador of Norway to India on 01.11.2023 at Dr. T. P. Ganesan Auditorium, SRMIST

Dr. Paromita Chakraborty, Head (REACH) delivered a comprehensive summary of the conference proceedings, encapsulating the essence of the enriching discussions and key takeaways. **Prof. B. Neppolian**, Dean (Research) conveyed heartfelt gratitude, acknowledging the invaluable contributions of all participants, dignitaries, and organisers in making ICSDG 2023.

Lt. Col. Dr. A. Ravi Kumar Pro-Vice Chancellor (Medical) and Prof. Paromita Chakraborty Head, REACH felicitated Chief Guest Ms. May-Elin Stener, Ambassador of Norway to India

Dr.Jayanthi Murali IFS, delivered the Guest of Honour's address to the gathering virtually. She mentioned that localizing of SDG implementation is key to the success of climate action and reducing widening inequalities. "Higher education institutions must help create scientific-minded youth who can come forward with evidence-based innovations and research to aid governments and policy makers". The Chairperson also highlighted Government of Tamil Nadu's Meendum Manjappai campaign in replacing single-use plastic usage with traditional yellow cloth bags.

Guest of Honour, Dr. Jayanthi Murali IFS, Chairperson - Tamil Nadu Pollution Control Board delivered her virtual address to the gathering during the inaugural ceremony on 01.11.2023 at Dr. T. P. Ganesan Auditorium

Lt. Col. Dr. A. Ravi Kumar (Pro-Vice Chancellor, Medical), Dr. T. V. Gopal (Dean- CET), Prof. Bernaurdshaw Neppolian (Dean Research), Prof. Paromita Chakraborty (HEAD, REACH), Ms. Marit Strand (Counselor, Royal Embassy of Norway), convenors from 17 SDGs during the inaugural ceremony of ICSDG 2023 conference on 01.11.2023 at Dr. T. P. Ganesan Auditorium

Lt. Col. Dr. A. Ravi Kumar (Pro-Vice Chancellor, Medical) felicitating Ms. Marit Strand (Counselor, Royal Embassy of Norway) during the inaugural ceremony of ICSDG 2023 conference on 01.11.2023 at Dr. T. P. Ganesan Auditorium

Valedictory Ceremony

The valedictory function of the 2nd International Conference on Higher Education Institute's Challenges & Solutions for Sustainable Development Goals (ICSDG) culminated on November 3rd at the Medical New Seminar Hall. **Prof. Paromita Chakraborty** extended a warm welcome to all attendees, setting the stage for the concluding ceremonies. **Tmt. S Madhumathi IAS**, the Managing Director of Tamil Nadu Small Industries Development Corporation, delivered the valedictory address remotely, underlining the significance of sustainable development within small industries.

Tmt. S. Madhumathi IAS, Managing Director – Tamil Nadu Small Industries Development Corporation delivered the valedictory address held on 03.11. 2023 at New Seminar Hall, SRM Medical College

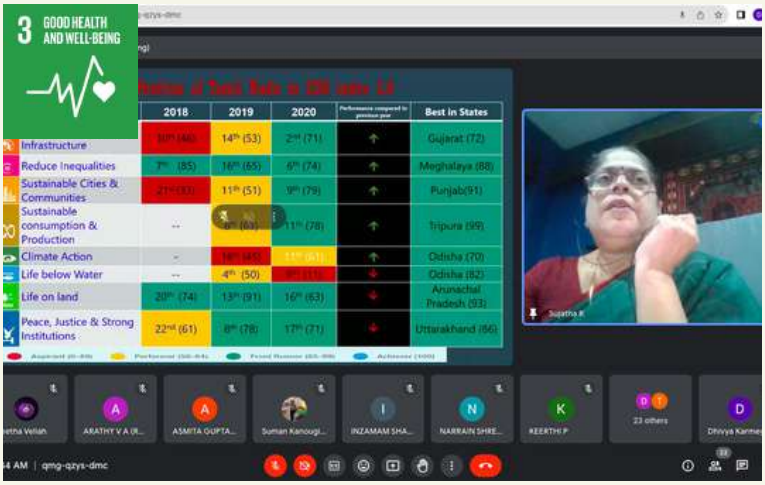
The response to the conference was remarkable, with an impressive 1036 registrations demonstrating the widespread interest and commitment to the cause. Among these, 623 enthusiastic individuals actively participated, contributing their perspectives and insights toward the shared objectives. A notable highlight of the event was the Hackathon, drawing in 256 eager participants who leveraged their creativity and skills to ideate and innovate solutions aligned with the SDGs.

ICSDG at SRM IST stands as a testament to the collective commitment and enthusiasm toward realizing the SDGs. It fosters collaboration, innovation, and informed dialogue, paving the way for actionable strategies and a collective drive toward a more sustainable and equitable future.

Award and Prize winners during Valedictory function of 2nd ICSDG 2023 conference held on 03.11.2023 at New Seminar Hall, SRM Medical College


1 NO POVERTY


2 ZERO HUNGER


3 GOOD HEALTH AND WELL-BEING
2018
2019
2020
Best in States
Infrastructure
Reduce Inequalities
Sustainable Cities & Communities
Sustainable consumption & Production
Climate Action
Life below Water
Life on land
Peace, Justice & Strong Institutions
Gujarat (72)
Meghalaya (88)
Punjab(91)
Tripura (99)
Odisha (70)
Odisha (82)
Arunachal Pradesh (93)
Uttarakhand (66)


4 QUALITY EDUCATION
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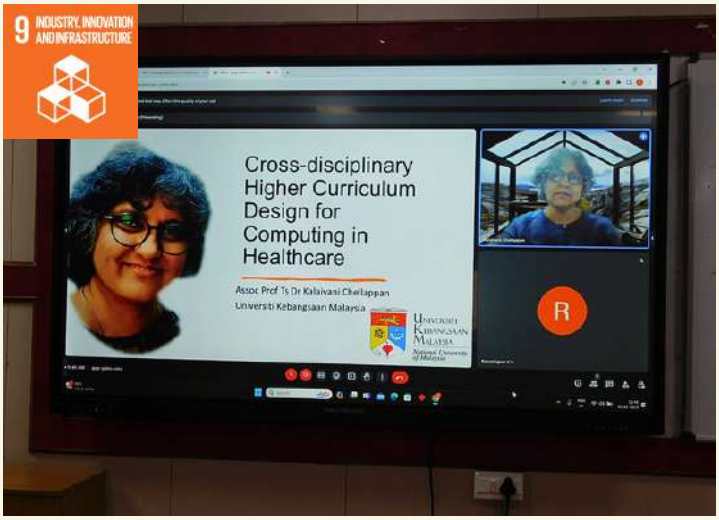
5 GENDER EQUALITY


6 CLEAN WATER AND SANITATION


7 AFFORDABLE AND CLEAN ENERGY
MAIN MV PANEL


8 DECENT WORK AND ECONOMIC GROWTH
SRM
FACULTY OF MANAGEME


9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Cross-disciplinary Higher Curriculum Design for Computing in Healthcare
Assoc Prof Ts Dr Kalaivani Chellappan
Universiti Kebangsaan Malaysia


10 REDUCED INEQUALITIES
Sustainable Development Goals '23
Organised by
SRM
2nd International Conference on
HIGHER EDUCATION INSTITUTES CHALLENGES & SOLUTIONS FOR SUSTAINABLE DEVELOPMENT GOALS '23
SDG 10: REDUCED INEQUALITIES


12 RESPONSIBLE CONSUMPTION AND PRODUCTION


11 SUSTAINABLE CITIES AND COMMUNITIES


14 LIFE BELOW WATER
THE GLOBAL GOALS


13 CLIMATE ACTION
GPS Map Camera
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16 PEACE, JUSTICE AND STRONG INSTITUTIONS


15 LIFE ON LAND


17 PARTNERSHIPS FOR THE GOALS
SRM

Norwegian Ambassador's visit to REACH's laboratories

From Left to Right: Ms. Marit Strand, Counsellor - Norwegian Embassy ; Her Excellency Ms. May-Elin Stener, Norwegian Ambassador to India ; Prof. Paromita Chakraborty, REACH ; Prof. Koustuv Dalal, Mid Sweden University

Her Excellency Ms. May-Elin Stener visited REACH's laboratories and was briefed about the various innovative prototypes under development and interacted with PhD scholars

Safeguarding public health using wastewater based epidemiology for monitoring of SARS-CoV-2 in cities

Wastewater-based epidemiology (WBE) is a promising approach which uses chemical and biological markers to understand the prevalence of viruses in a given wastewater treatment plant (WWTP) catchment population from symptomatic and asymptomatic individuals.

Sewage sampling can detect a rise and fall in novel coronavirus concentrations and associated markers that correspond to SARS-CoV-2 (COVID-19) outbreak in a specific region. Hence, we conducted surveillance of the wastewater in Chennai city as well as Tiruchirappalli and Thiruvananthapuram cities covering the densely populated regions.

REACH has worked together with the Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) and Swasti, Health Catalyst in our effort to aid city public health administration.



DST-SERB funded project for monitoring SARS-CoV-2 in wastewater of Chennai city



Skoll Foundation & Blockchain for Impact funded project as part of the Precision Health Platform of Swasti (The Health Catalyst) for monitoring SARS-CoV-2 in wastewater of Tiruchchirapalli City



Skoll Foundation & Blockchain for Impact funded project as part of the Precision Health Platform of Swasti (The Health Catalyst) for monitoring SARS-CoV-2 in wastewater of Thiruvananthapuram City

Outreach Initiative on Action for Rivers

Prof. Paromita Chakraborty, Head of REACH, Directorate of Research along with her team actively engaged in the outreach initiative to clean a segment of the **Adyar River bank** at **Chetty-thottam, Saidapet**.

50 dedicated participants from various disciplines of SRMIST took part in the river clean-up program and also in raising awareness among the local community residing near the Adyar River, emphasizing the significance of rivers and the imperative to maintain their cleanliness.

Participants engaged during Outreach Initiative on Action for Rivers held on 14.03.2023 at the Adyar River Bank, Chetty thottam, Sasidapet.

International Participation

Prof. Paromita Chakraborty invited as panelist and invited speaker at the Bangladesh Mission for UN Waters Conference 2023

Prof. Chakraborty invited as special guest speaker at the "Workshop on implementing the Stockholm Convention on POPS and Chemical Substances" in the Sultanate of Oman on 27th and 28th February 2023

Prof. Chakraborty honoured as External Scientific Fellow of the Faculty of Biology and Environmental Protection at University of Lodz, Poland on 12th September 2023

Prof. Chakraborty at STOTEN's 50th year anniversary celebrations held between 3rd to 6th May 2023 at Westin Hotel in Dublin, Ireland

Prof. Chakraborty visited the lab of INOPOL project partner "Norwegian Institute of Water Research" and interacted with scientists and project personnel

Awards/Achievements

Dr. Suriyaprakash, Scientist - REACH, received "Research Appreciation Award" at International Conference on Trends in Biological Sciences: Impetus on Human Health, 12-13 October, 2023

"Green Excellence Award" being presented by Save The Environment NGO

"Best Awareness Campaign Award" at Recommerce Expo, Bangalore on August 10, 2023

Journal Publications

1. Krushna Vudamala, Paromita Chakraborty, Ramesh Chatragadda, Anoop Kumar Tiwari, Asif Qureshi, Distribution of organochlorine pesticides in surface and deep waters of the Southern Indian Ocean and coastal Antarctic waters, Environmental Pollution, Volume 321, 2023, 121206, https://doi.org/10.1016/j.envpol.2023.121206.

2. Jain, M., Sharma, B. M., Sachdeva, S., Kuta, J., Červenka, R., Nizzetto, L., ... & Chakraborty, P. (2023). Occurrence, Source and Dietary Exposure of Toxic and Essential Elements in the Indian Food Basket. Archives of Environmental Contamination and Toxicology, 85(4), 466-484.

3. VamshiKrishna Gandla, Mounika Chiluka, Harish Gupta, Sukesh Narayan Sinha, Paromita Chakraborty, Sediment-water partitioning and risk assessment of organochlorine pesticides along the urban, peri-urban and rural transects of Krishna River Basin, Peninsular India, Science of The Total Environment, Volume 874, 2023, 162360, https://doi.org/10.1016/j.scitotenv.2023.162360.

4. Asvad, S.R., Esmaili-Sari, A., Behrooz, R.D., Rajaei, F., Valinasab, V., Paromita, C., Comparison of Cd, Cu, Se, and Zn Concentration in the Muscle and Hepatopancreas of Sepia pharaonis and Uroteuthis duvauceli in the North of Persian Gulf (Iran). Biol Trace Elem Res (2023). https://doi.org/10.1007/s12011-023-03712-1

5. Prasad, G., Mohanty, S., Nayak, S.K., Bharat, G.K., Paromita, C., A Scientific Approach to the Occurrence, Isolation, and Characterization of Existing Microplastic Pollution in the Marine Environment—a Review. Water Air Soil Pollut 234, 480 (2023). https://doi.org/10.1007/s11270-023-06494-3

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7. Sharma, B.M., Scheringer, M., Chakraborty, P. et al. Unlocking India's Potential in Managing Endocrine-Disrupting Chemicals (EDCs): Importance, Challenges, and Opportunities. Expo Health 15, 841–855 (2023). https://doi.org/10.1007/s12403-022-00519-8

8. Alshemmari H, Al-Kasbi MM, Kavil YN, Orif MI, Al-Hulwani EK, Al-Darii RJ, Al-Shukaili SM, Al-Balushi FA, Chakraborty P. New and legacy pesticidal persistent organic pollutants in the agricultural region of the Sultanate of Oman. Journal of Hazardous Materials. 2023 Oct 5;459:132205, https://doi.org/10.1016/j.jhazmat.2023.132205

9. Mohasin, P., Chakraborty, P., Anand, N., & Ray, S. (2023). Risk assessment of persistent pesticide pollution: Development of an indicator integrating site-specific characteristics. Science of The Total Environment, 861, 160555.

10. Chandra S, Chakraborty P. Air-water exchange and risk assessment of phthalic acid esters during the early phase of COVID-19 pandemic in tropical riverine catchments of India. Chemosphere. 2023 Nov 1;341:140013, https://doi.org/10.1016/j.chemosphere.2023.140013

11. Soman S, Christiansen A, Florinski R, Bharat G, Steindal EH, Nizzetto L, Chakraborty P. An updated status of currently used pesticide in India: Human dietary exposure from an Indian food basket. Environmental Research. 2023 Nov 25:117543, https://doi.org/10.1016/j.envres.2023.117543

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14. Vijayakumar Pradeshwaran, Wei-Hsin Chen, Ayyadurai Saravanakumar, Rajadesingu Suriyaprakash, Anurita Selvarajoo, Biocatalyst enhanced biogas production from food and fruit waste through anaerobic digestion, Biocatalysis and Agricultural Biotechnology, volume 55, 2023, 102975, https://doi.org/10.1016/j.bcab.2023.102975.

15. Wei-Hsin Chen, Shu-Cheng Li, Amit Kumar Sharma, Joon Ching Juan, Ayyadurai Saravanakumar, An investigation of water gas shift reaction in a Pd-alloy membrane reactor with an optimized crossflow configuration, Energy Nexus, Volume 12, 2023, 100240, https://doi.org/10.1016/j.nexus.2023.100240.

16. Ayyadurai Saravanakumar, M.R. Sudha, Wei-Hsin Chen, Vijayakumar Pradeshwaran, Veeramuthu Ashokkumar, Anurita Selvarajoo, Biomethane production as a green energy source from anaerobic digestion of municipal solid waste: A state-of-the-art review, Biocatalysis and Agricultural Biotechnology, Volume 53, 2023, 102866, https://doi.org/10.1016/j.bcab.2023.102866.

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19. Suriyaprakash Rajadesingu, P. Monisha, Kantha Deivi Arunachalam, Synthesis and characterization determination of boric acid for gamma and neutron shielding efficiency of bio-caulk incorporated high-performance concrete (HPC), Surfaces and Interfaces, Volume 41, 2023, 103223, https://doi.org/10.1016/j.surfin.2023.103223.

Book Chapters

1. “Environmental monitoring and analytical techniques in abiotic matrices of new persistent organic pollutants in India”, K Pavithra, Avanti Roy-Basu, Girija Bharat, Paromita Chakraborty*, Laying the knowledge grounds for enhanced policy and management of Persistent Organic Pollutants (POPs) in India, Springer.

2. “Persistent organic pollutants associated with plastic waste: an Indian perspective” Paromita Chakraborty*, Sarath Chandra, Avanti Roy Basu, Girija K Bharat, Laying the knowledge grounds for enhanced policy and management of Persistent Organic Pollutants (POPs) in India, Springer.

3. “Analysis of Gaps in Management of POPs in India” Manisha Jain, Girija K Bharat, Malene Vågen Dimmen, Ronnie Rex, Sarath Chandra, Paromita Chakraborty*, Laying the knowledge grounds for enhanced policy and management of Persistent Organic Pollutants (POPs) in India, Springer.

4. “Case Studies-Tapi and Daman Ganga River Basins in Gujarat” Girija K Bharat, Avanti Roy Basu, Sarath Chandra, Ronnie Rex, Paromita Chakraborty*, Abdullah Atiq, Suneel Pandey, Twinkle Dev, Alka Dubey, Piyush Mohapatra, Laying the knowledge grounds for enhanced policy and management of Persistent Organic Pollutants (POPs) in India, Springer.

5. “Chemicals in Plastic” Sarath Chandra and Paromita Chakraborty*, Knowledge framework for efficient and enhanced management of plastic waste in India, Springer.

6. “Chemistry, Production and Consumption of Pesticidal EDCs” Sidhi Soman, Brij, Mohan Sharma, Paromita Chakraborty*, Endocrine Disrupting Chemicals, Elsevier.

7. “Chemistry, Production and Consumption of Industrial chemicals” Ronnie Rex K, Sarath Chandra J, K Pavithra, V. Tharmaraj, Moitraiyee Mukhopadhyay, RR Parthasarathi, Paromita Chakraborty*, Endocrine Disrupting Chemicals, Elsevier.

8. “Sampling and extraction techniques for EDCs” Sarath Chandra J, K Pavithra, RR Parthasarathi, Afeez Ahamed, Mohamed Abdul Wajith, Divyash Singh, Paromita Chakraborty*, Endocrine Disrupting Chemicals, Elsevier.

9. “Analytical techniques for the estimation of Pesticides” Ronnie Rex K, Sidhi Soman, Paromita Chakraborty*, Endocrine Disrupting Chemicals, Elsevier.

10. “Analytical Techniques for Estimation of Industrial chemicals” Pavithra K, Ronnie Rex K, Sarath Chandra J, V. Tharmaraj, Moitraiyee Mukhopadhyay, Paromita Chakraborty*

11. “Environmental occurrence of pesticides” Sidhi Soman K, Ronnie Rex K, Paromita Chakraborty*, Endocrine Disrupting Chemicals, Elsevier.

Book Chapters

12. “Exposure Pathway and Risk assessment of EDCs” Paromita Chakraborty*, Sarath Chandra J, K Pavithra, Moitraiyee Mukhopadhyay, Divyash Singh, Mon Bera, Brij Mohan Sharma, Endocrine Disrupting Chemicals, Elsevier.

13. “Removal techniques of EDCs in soil and Sediment”, K Pavithra, Ilansuriyan A, Giridharan K, Yuvan Sai Potru, Paromita Chakraborty*, Endocrine Disrupting Chemicals, Elsevier.

14. “Microplastic in the environment: sources, workflow, identification techniques, and impacts on human health” Tharmaraj Vairaperumal, Devi Selvaraj, Paromita Chakraborty, Elsevier.

15. “Geospatial Mapping of COVID-19 Cases in Kerala Using Clinical Data: A Case Study from South India for Policy Advocacy.” Vinod, P.G., Bharat, G.K., Gaonkar, O., Chakraborty, P. (2023). The Handbook of Environmental Chemistry. Springer, Berlin, Heidelberg.

In Media

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THE TIMES OF INDIA

Buckingham Canal full of antibiotics: Study

TNN | Aug 20, 2023, 08.03 AM IST

CHENNAI: Buckingham Canal has higher concentration of antibiotics than the Adyar or the Cooum, according to a 2022 study. "The reason is the canal has more raw sewage outfalls than the two rivers. Also, the canal is narrower with less flow, causing a rise in the antibiotic concentration," said Paromita Chakraborty, one of the researchers of the study and assistant professor at SRM University. "Whatever antibiotics you eat, 60% to 70% of the drugs is going to come out in human waste, which makes up the sewage," she said.

The research studied the concentration of antibiotics, including tetracyclines, phenicols, sulphonamides, fluoroquinolones and macrolides. To test for these antibiotic concentrations, water samples were taken from Buckingham Canal and Adyar and Cooum rivers, and surface water samples near Kodungaiyur dumpyard and treated sewage water samples from treatment plants in Perungudi, Kodungaiyur and Kattankulathur in 2017. The portions of the Adyar that meet Buckingham Canal were found with about 60% of all antibiotics in the river. The portions of the Cooum that meet the canal had 35% of all antibiotics in the river.

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THE TIMES OF INDIA

Air pollution impact in Tamil Nadu is less severe

TNN | Aug 31, 2023, 07.41 AM IST

CHENNAI: People in the city and other parts of the state may live longer than people in a few other states in spite of the presence of fine particulate matter in the air.
The impact of air pollution due to fine particulate matter (PM2.5) on the life expectancy of people in Tamil Nadu may be less compared to a few other states. An air quality life index report released by the energy policy institute at the university of Chicago said the life of an individual in Tamil Nadu may get cut down by 2.3 years if the present PM2.5 concentrations continue while those in states like Madhya Pradesh, Rajasthan, Gujarat and Karnataka may lose anywhere between 2.4years to 4.9 years.

The four states, which have a population slightly less or more than that of TN- which has 768.2lakh people- have high PM2.5 average concentrations ranging between 20microgram/m3 and 54.7microgram/m3 compared to 28.2microgram/m3 levels in Tamil Nadu, which is less than national PM2.5 standards of 40microgram/m3.
Experts said factors like winds, temperature, rainfall and humidity and a better handling of vehicle emissions could be a reason for the comparatively less PM2.5 concentrations in the state.

While the report states life expectancy gains in the state could be 2.3 years if the WHO PM2.5 guideline of 5microgram/m3 is met, it also meant that an average individual may lose 2.3years in life expectancy if the PM2.5 levels are not met.

Partners & Stake Holders

Norwegian Embassy in India

NIVA
Norsk institutt for vannforskning
Norwegian Institute for Water Research

The Research Council of Norway

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

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Ministry of Environment Forest and Climate Change

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Indian Institute of Technology Madras

Chennai Metropolitan Water Supply and Sewerage Board

Kerala Water Authority

Corporation of Thiruvananthapuram

Department of Health Services Kerala

SUCHITWA MISSION
Local Self Government Department Kerala

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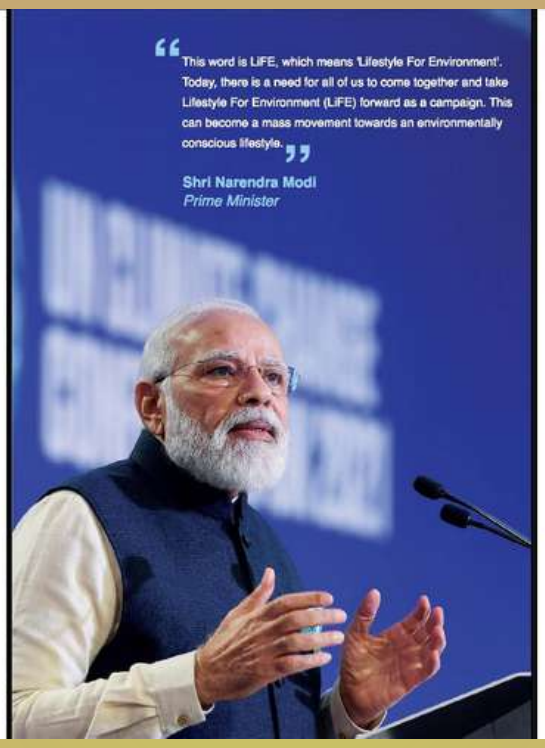
Directorate of Research, SRMIST



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