Event Report

International Workshop on

SUSTAINING CHALLENGES & PROTECTING MOTHER EARTH

29.4.2025 – 30.4.2025

Organised by

Centre for Research in Environment, Sustainability Advocacy and Climate Change (REACH)
Directorate of Research, SRM Institute of Science and Technology
Kattankulathur, Tamil Nadu, India

In association with

Indian Desalination Association (Southern Zone)

OUR POWER, OUR PLANET

OUR POWER, OUR PLANET

Participants List

Participant names	Department	Institution	Category	Gender
Irshana Shajahan	Chemical Eng.	SRMIST	Student	Female
Keerthana S	English and Foreign Languages	SRMIST	Academician	Female
Raghunand Ashok	Chemical Eng.	SRMIST	Student	Male
Yuvanesh J	Chemistry	SRMIST	Student	Male
Saichand Venkatachalam	Civil Eng.	SRMIST	Student	Male
M. Gopika	Biotechnology	SRMIST	Student	Female
A.R. Asmita	Biotechnology	SRMIST	Student	Female
Dinesh S	Chemical Eng.	SRMIST	Student	Male
Abhinaya K	Biotechnology	SRMIST	Student	Female
Maitreyi M	Biotechnology	SRMIST	Student	Female
E. Swetha	Biotechnology	SRMIST	Student	Male
Vellampalli Mohan Venkata Sai Krishna	Civil Eng.	SRMIST	Student	Male
Aayush M V	Biotechnology	SRMIST	Student	Male
G.P. Sanjana	Biotechnology	SRMIST	Student	Female
Amrita Udhayakumar	Faculty of Public Health	Sri Ramachandra Inst. of Higher Education and Research	Student	Female
Shadasree Sundararajan	Faculty of Public Health	Sri Ramachandra Inst. of Higher Education and Research	Student	Male
C. Senthil Nathan	Faculty of Management	SRMIST	Faculty	Male
Kanchana R	Chemistry	SRMIST	Student	Female
Manisha Jain	Biotechnology	Manav Rachna International Institute for Research and Studies	Student	Female
Lavanya Salian	Biotechnology	SRMIST	Student	Female

1. INTRODUCTION

The **World Earth Day** is a global event dedicated to raising awareness about environmental issues and promoting sustainable practices to protect our planet. Its significance lies in uniting people worldwide to take action against climate change, pollution, deforestation, and the depletion of natural resources. In support of Earth Day 2025, **Centre for Research in Environment, Sustainability, Advocacy and Climate change (REACH),** Directorate of Research, SRMIST in association with **Indian Desalination Association (InDA, Southern Zone)** organised a two-day workshop on the topic **"Sustaining Challenges & Protecting Mother Earth".** For more than half a century, Earth Day has been a catalyst for action—uniting individuals, communities, and nations in the fight for clean air, thriving oceans, fertile soil, biodiversity, and human well-being. At the heart of this movement lies people power—grassroots energy capable of transforming even the most entrenched systems. This year's theme, "**Our Power, Our Planet**," reminds us that we hold the solutions in our hands. With renewable technologies like solar and wind now within reach, we have the tools to create clean, affordable, and limitless energy. The workshop was conducted as part of the SDG initiative for the International Conclave on SDGs 2025 event.

The main objective of the workshop was to educate the participants about the environmental challenges and solutions and fostering a greater understanding of the interconnectedness of human actions and the environment. Also it emphasises, building community for working on environmental related projects, protecting biodiversity and ensuring the health of ecosystems and supporting research and development of new technologies and practices that can help address environmental problems. **21 participants** from SRMIST and other prestigious institutions of India actively took part in the workshop coming. The workshop spanned for 2 days- **29.4.2025** to **30.4.2025.**

2. DAY I EVENTS

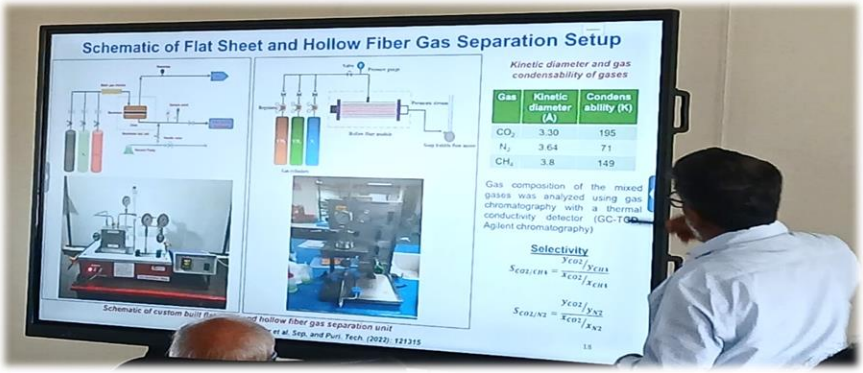
2.1 Inaugural Event

The program initiated with an inaugural welcoming by Dr. Paromita Chakraborty, Head, REACH, Directorate of Research, SRMIST Kattankulathur. In the Introductory Talk, Dr. Paromita mentioned that the universities play a vital role in this movement by educating students about environmental challenges and inspiring them to adopt eco-friendly habits. The

above was followed by felicitation of Dr. G. Arthanareeswaran, Event Co-Chair and Professor Dept. of Chemical Engineering, NIT Tiruchirapalli, Dr. Sajay Kumar Mehta Research Professor, Atmospheric observations and modelling laboratory, Dept. of Physics & Nanotechnology, SRMIST, Kattankulathur, and Dr. S. Vishali, Professor, Head Dept. of Chemical Engineering, SRMIST, Kattankulathur with mementoes.

2.2 Lecture I

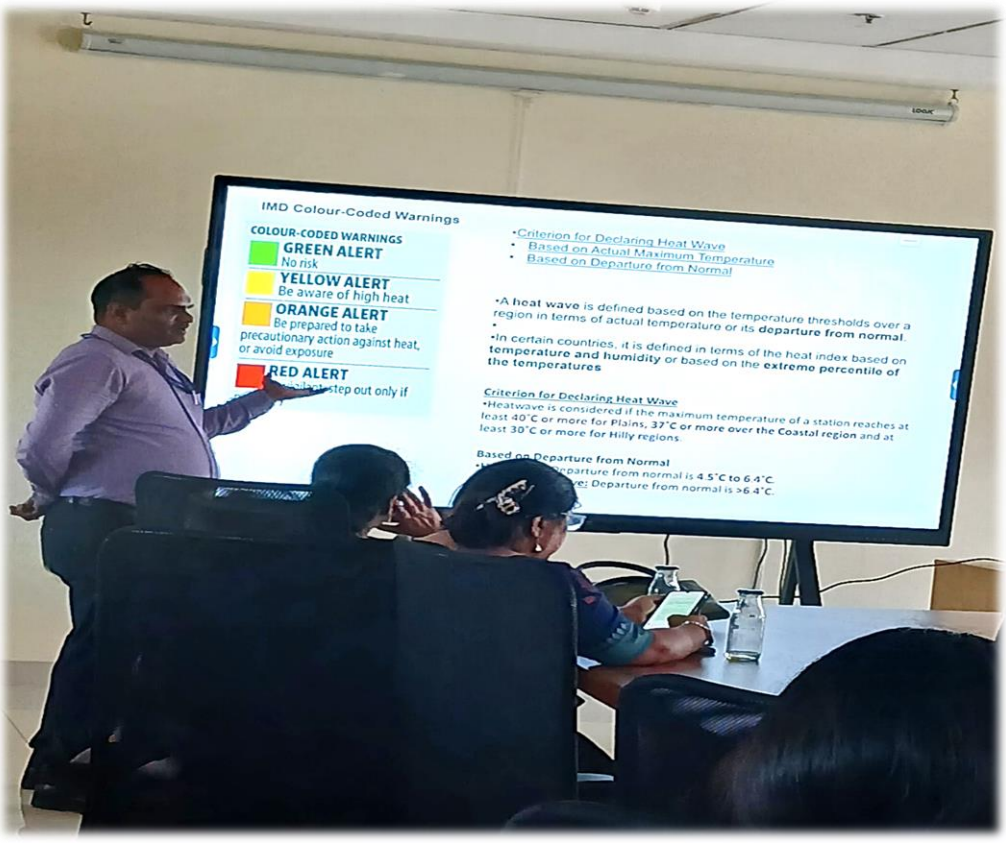
The first lecture was delivered by **Dr. G. Arthanareeswaran** on the topic "**Membrane Technology for Solid Earth, Its Waters, Climate and Atmosphere**". Dr. G. Arthanareeswaran's lecture discussed the consequences of discharging untreated water on wetlands and its prolonged effect on human health and the requirement of water pretreatment. He discussed the robustness of membrane filtration methods and its several advantages like simplicity, versatility, high efficiency and reduced waste generation. Application of membrane technology for the separation of Greenhouse gases like CO_2 was demonstrated through certain experimental setups. Ceramic, Reverse Osmosis (RO), Forward Osmosis (FO), nanocomposite, and biomimetic membranes are among the various types of membranes used in water treatment and separation technologies. Further, the Ceramic membranes offer advantages like high strength and chemical stability, while RO and FO processes utilize membranes for water purification and separation based on different pressure gradients. Nanocomposite membranes combine nanoparticles with a base material for enhanced properties, and biomimetic membranes mimic biological structures for improved functionality. Professor's lecture focussed on **SDG 6** (Clean Water and Sanitation) and **SDG 13** (Climate Action) and **SDG 15** (Life on Land). He discussed the use of membrane technology for getting cleaner water and cleaner Earth's atmosphere.



Dr. G. Arthanareeswaran discussing the custom-built Flat Sheet and Hollow Fiber Gas separation setups and the selectivity achieved from the above units

2.3 Lecture II

The second lecture was delivered by **Dr. Sanjay Kumar Mehta** on the topic "**Extreme heatwave events and potential threat to living beings: Possible causes and solutions**". His lecture focussed on how the extreme heatwaves are worsening Earth's climate. The significance of Greenhouse gases for maintaining a normal earth temperature and how the increase results in our planet temperature warmer was discussed. The concept of differential heating, colour coded warnings and heating differences in dried and moist regions were explained. The lecture also discussed how monsoon arrives India, the concepts of El Nino Southern oscillation (ENSO), LaNino and how the heat waves affect the mortality rate and breeding rates of marine species was discussed. Dr. Mehta's lecture emphasised on the significance of **SDG 13** (Climate Action), **SDG 14** (Life below Water) and **SDG 15** (Life on Land)



.

Dr. Sanjay Kumar Mehta discussing various colour coded warnings and the alerts indicated from the above

2.4 Lecture III

The third lecture was delivered by **Dr. S. Vishali** on the topic "**The Game-Changing Impact of Grey Water Treatment and Recycling in Healing the Earth**". The lecture first discussed

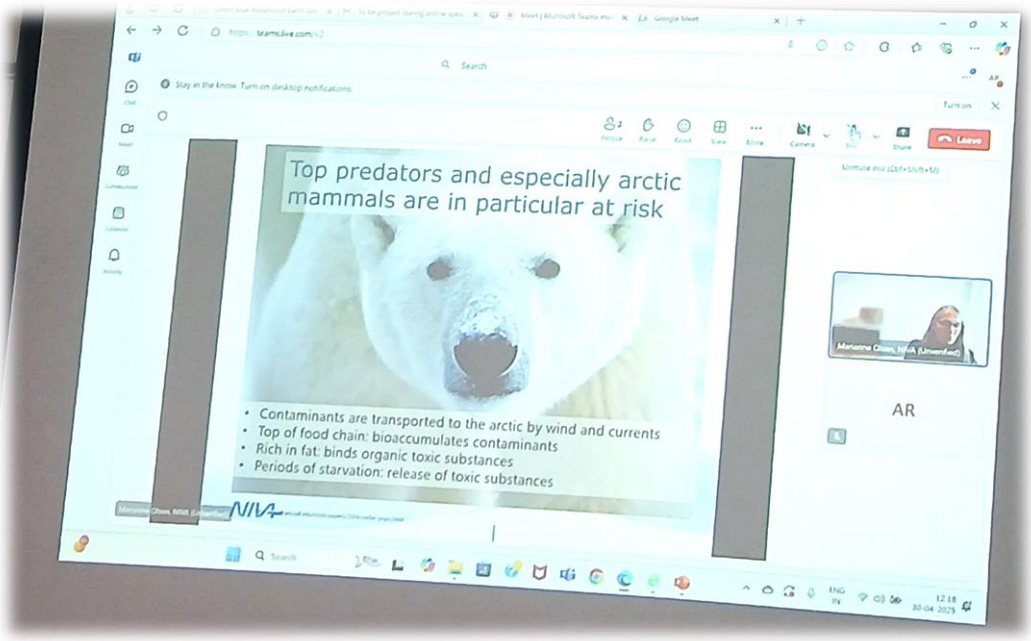
the concept of grey water: which is the water originating from all household applications other than blackwater, the water from the washing machines, dishwashers, showers, baths and sinks. The normal volume of greywater varies from 90 – 120 Litres Per Day according to published literature. The availability of greywater in large amount, lower degree of fecal contamination and a simple treatment process makes the greywater an attractive water resource if reused effectively. For achieving the same, the team of Dr. S. Vishali applied a combined treatment approach, through which they optimized certain treatment units and the respective operating conditions which were most feasible for the purification of Greywater. The team tried several combinations of wastewater treatment processes and unit operations among which a combination of Coagulation aided with Dissolved air flotation and carbon adsorption worked best and resulted in 97 % pollutant removal. advantages of these minimal unit operations include shorter treatment time and low treatment cost over other trials. The team proposed a mobile Integrated Water Treatment System "**SUZHALI**" which integrated natural Coagulation, Adsorption, Electro-Coagulation & Reverse Osmosis in one system. The above research was an award winning one and led her to bag awards and appreciation from Tamil Nadu Pollution Control Board and SRMIST. Dr. Vishali's Lecture emphasized on the significance of **SDG 6** (Clean water and Sanitation) and **SDG 15** (Life on Land).

Dr. S. Vishali discussing the Mobile Integrated Water Treatment System (MIWTS)

3. DAY II EVENTS

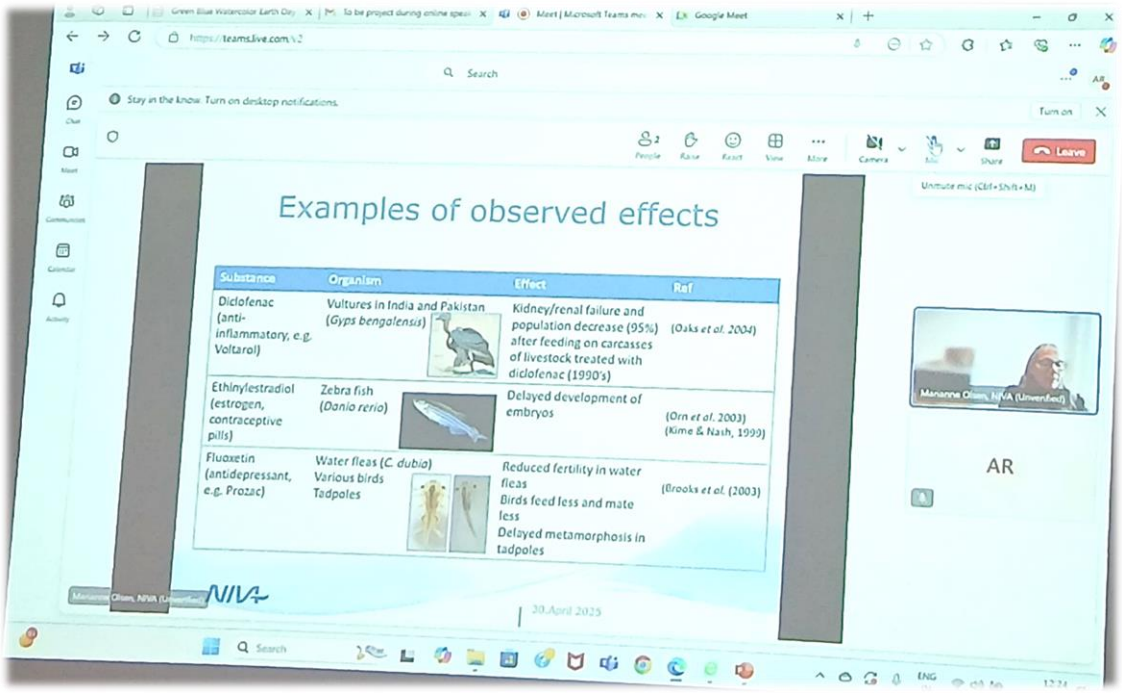
3.1 Lecture IV

The lecture IV was delivered by **Dr. Marianne Olsen** on the topic "**Contamination of aquatic environments: Environmental Impact Assessments, Pollution risk evaluations and sustainable water managemen**t". The lecture discussed the impact of water borne persistent pollutants on the health of living organisms. It discussed how the broad use of DDT in the United States and other countries led to the development of resistance in many insect pest species and to the death of birds. The lecture further illustrated how the marine environment is affected by anthropogenic sources of pollution, and marine environment serving as the ultimate sink for persistent organic pollutants (POPs). The lecture also stressed that how the Fjords in Norway due to their limited circulation and morphology, can trap aquatic contaminants, especially pollutants and heavy metals, for extended periods. This trapping of contaminants may lead to bioaccumulation of theses contaminants in the species lying at the top of food chain especially the arctic mammals, ecosystem impacts and long-term pollution. Research studies in several Fjords shown enhanced concentrations of mercury, dioxins, heavy metals and organic compounds.



Dr. Marianne Olsen discussing the limited circulation of contaminants in Fjords leading to their bioaccumulation in species lying at the top of food chain

The lecture further discussed the toxic effect of drugs on the growth rate of certain animals. For example, the feeding on carcasses treated with diclofenac resulted in kidney/renal failure of Vultures species *(Gyps bengalensis)* found in India and Pakistan. The lecture concluded that why the management of water bodies through regulatory norms is crucial and important. Food security, maintaining livelihoods, safeguarding public health, and preventing environmental degradation are the major key factors playing role. These norms are required for managing water-related risks like floods and droughts, allocating water resources equitably, thus protecting the ecosystems and maintaining the quality of water for various purposes. Dr. Olsen's Lecture emphasised on the significance of **SDG 14** (Life below water), **SDG 6** (Clean water and sanitation).

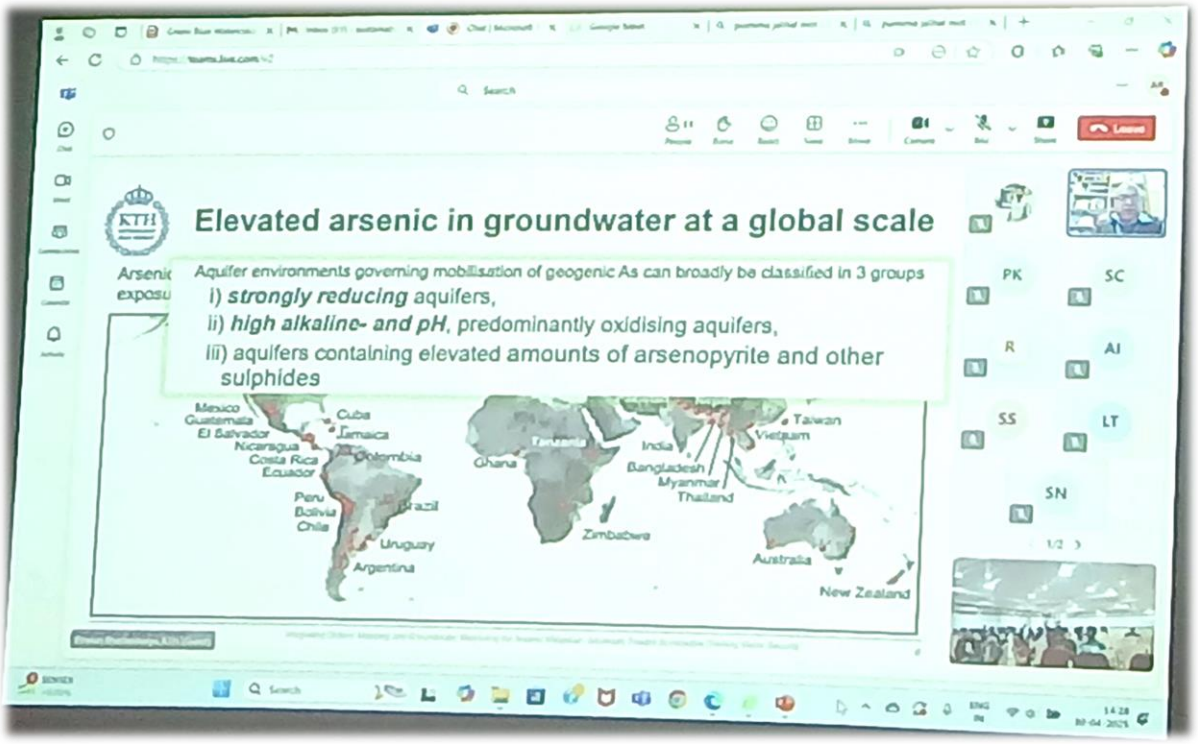


Dr. Marianne Olsen depicting the marine environment as the ultimate sink and several species getting affected by engulfing trace amounts of drugs present in marine water.

3.2 Lecture V

The lecture V was delivered by **Dr. Prosun Bhattacharya** on the topic "**Integrating Drilling Mapping and Groundwater Monitoring for Arsenic Mitigation: Advances toward Sustainable Drinking Water Security**". The lecture discussed that arsenic is the only known human carcinogen till now for which there is adequate evidence of health risk by both inhalation and ingestion. The consequence of chronic As exposure is dependent on the susceptibility, the dose and the time course of exposure. The effect on human health through

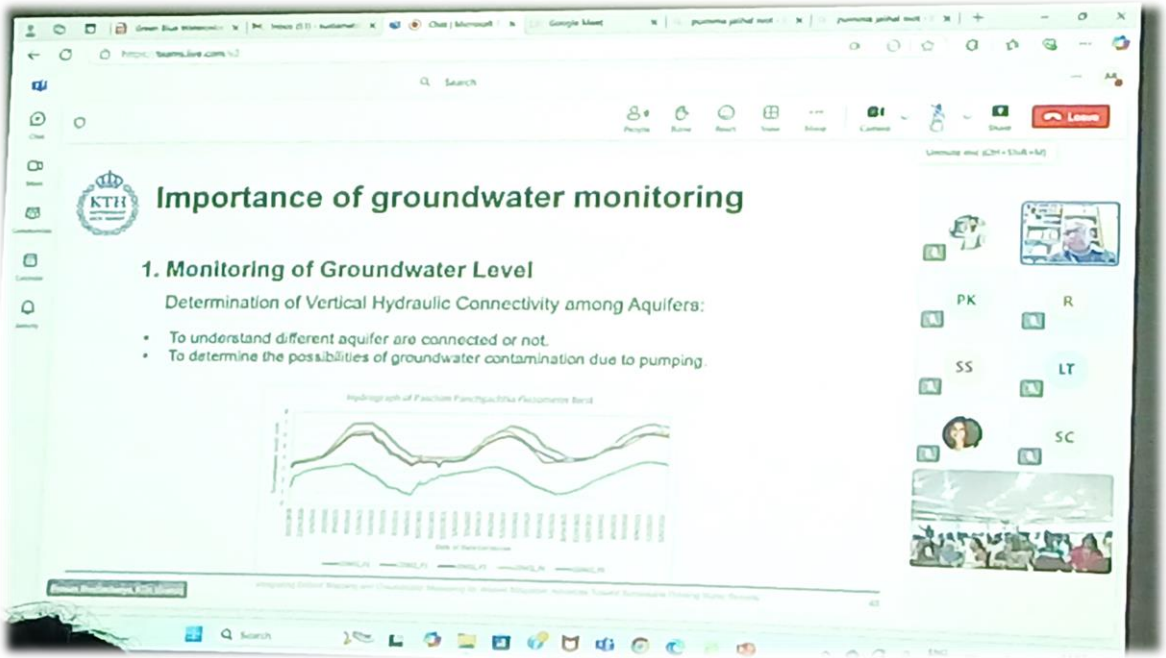
exposure of naturally occurring (geogenic) As in groundwater is due to exposure through three pathways: intake through drinking groundwater, through cooking processes and bioaccumulation in crops in crops irrigated with high As groundwater. The lecture discussed the presence of As in alluvial plains of Ganges-Meghna-Brahmaputra, Further the presence of As in the groundwater of Bangladesh was discussed. It was elaborated that being a densely populated country, >90% of water supply depends on depends on groundwater in Bangladesh. Though the groundwater provides microbial safe water but the shallow groundwater in most part of Bangladesh contains elevated levels of As.



Dr. Prosun Bhattacharya discussing the elevated arsenic level in groundwater at a global scale and how to identify the mobilisation of geogenic As in aquifers.

The lecture further discussed that addressing this issue requires a multidisciplinary approach that combines **drilling mapping** and **groundwater monitoring** to identify safe aquifers and ensure long-term water quality. Several advantages of integrating the two fields was discussed, which are: targeted well placement, dynamic water quality assessment and data-driven decision making. The drilling mapping process allows for precise identification of geological layers and helps locate aquifers less likely to be contaminated with arsenic. The process avoids random well installation, which often leads to tapping into arsenic-rich zones. Groundwater monitoring provides temporal data on arsenic concentrations, enabling communities and policymakers to track changes over time, detect emerging risks, and adjust

water sourcing strategies accordingly. The integration of geospatial drilling data with hydrochemical monitoring enhances decision-making at both local and regional levels. Tools such as GIS (Geographic Information Systems) and remote sensing can visualize and predict arsenic risk zones were discussed and elaborated. The lecture also discussed the selection of locations for groundwater monitoring wells and their selection guideline. To mitigate the arsenic contamination in groundwater, the development of Arsenic Safe Union model in Bangladesh by DPHE (department of Public Health Engineering) and UNISEF and its coordination with EPSC (Enhancing private sector capacity) was discussed. Dr. Prosun's Lecture emphasised majorly on the significance of **SDG 6** (Clean Water and Sanitation) and **SDG 15** (Life on Land).



Dr. Prosun Bhattacharya discussing the importance of groundwater monitoring and ways to monitor

3.3 Lecture VI

Lecture VI was delivered by **Dr. Purnima Jalihal** on the topic "**The Earth's Myriad Problems Today- Can the Oceans help?".** In the first part of her lecture Dr. Jalihal discussed the significance of Earth Day. She discussed in brief about the major global environmental issues rising nowadays and how they are affecting the earth and environment. A brief overview of Earth atmosphere profile was discussed. How the Earth's atmosphere acts as a protective buffer between the Earth's surface and outer space shielding the surface form meteoroids and UV solar radiation, maintaining heat and moisture, reducing diurnal temperature variation,

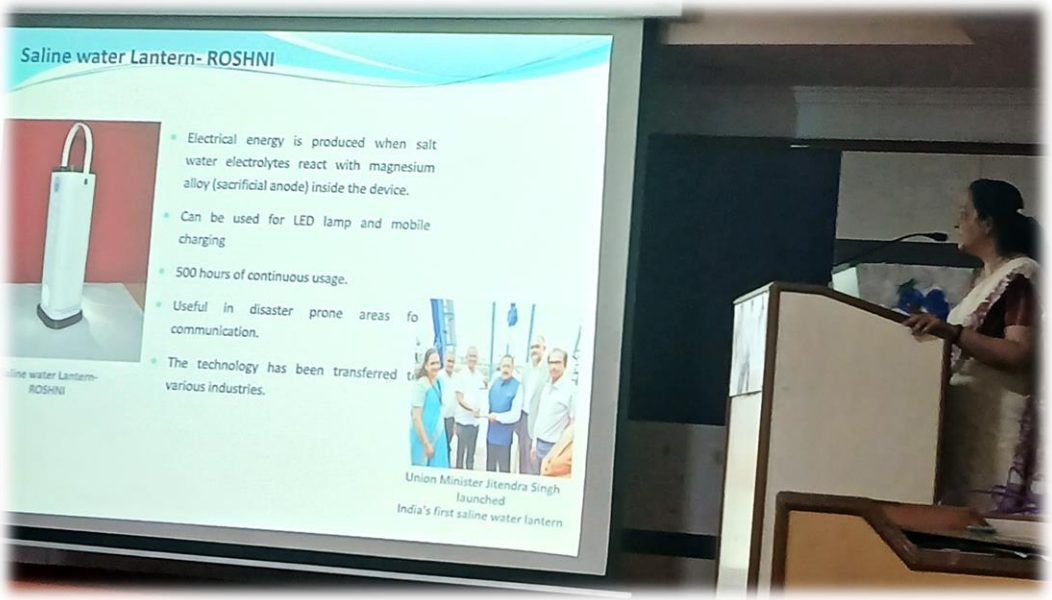
redistributing heat and moisture among different regions via air current, and providing the chemical and climate conditions allowing life to exist and evolve on Earth were discussed. Further the enhanced land pollution and its consequences such as health hazards, loss of biodiversity, reduced agricultural productivity, soil degradation and anthropogenic groundwater contamination were elaborated and discussed. The growing impacts of climate change on water resources such as change in precipitation patterns and seal level rise was illustrated in detail.

Dr. Purnima Jalihal discussing the significance of Earth Day and the actionable strategies to protect our planet.

The second part of her lecture focussed on the oceans which acts as a vast reservoir for Oil, Gas, Marine biodiversity, energy, water, minerals and gas hydrates. Shoreline changes, Shipping and Effluent pollution, Ocean acidification, Thermal pollution and contamination and certain persistent pollutants like microplastics and disturbing the marine life and ocean ecosystem was discussed. Dr. Jalihal discussed the establishment of several projects in India harnessing the ocean resources. Some of the majors were establishment of **floating Solar plant on Lakshadweep, Low Temperature Thermal Desalination (LTTD) plants and Ocean Thermal Energy Conversion (OTEC) desalination plant**. Studies on the experimental setup for H_2 generation by OTEC powered electrolyser is under way. Further the launching of India's first saline water lantern ROSHNI was discussed. The device can be used for LED lamp and

mobile charging, can give 500 h of continuous usage. The device is useful in disaster prone areas for communication. The lecture concluded with the lines "Every drop from the sky – finally ends in the ocean- let us nurture the primordial oceans and thereby the air and Land…" The diversified and outstanding lecture of Dr. Purnima Jalihal focussed on the significance of multiple SDGs, including that for **SDG 13** (Climate Action), **SDG 15** (Life on Land), **SDG 7** (Affordable and Clean Energy) and **SDG 6** (Clean Water and Sanitation).

Dr. Purnima Jalihal discussing the establishment of LTTD plants in various locations of India

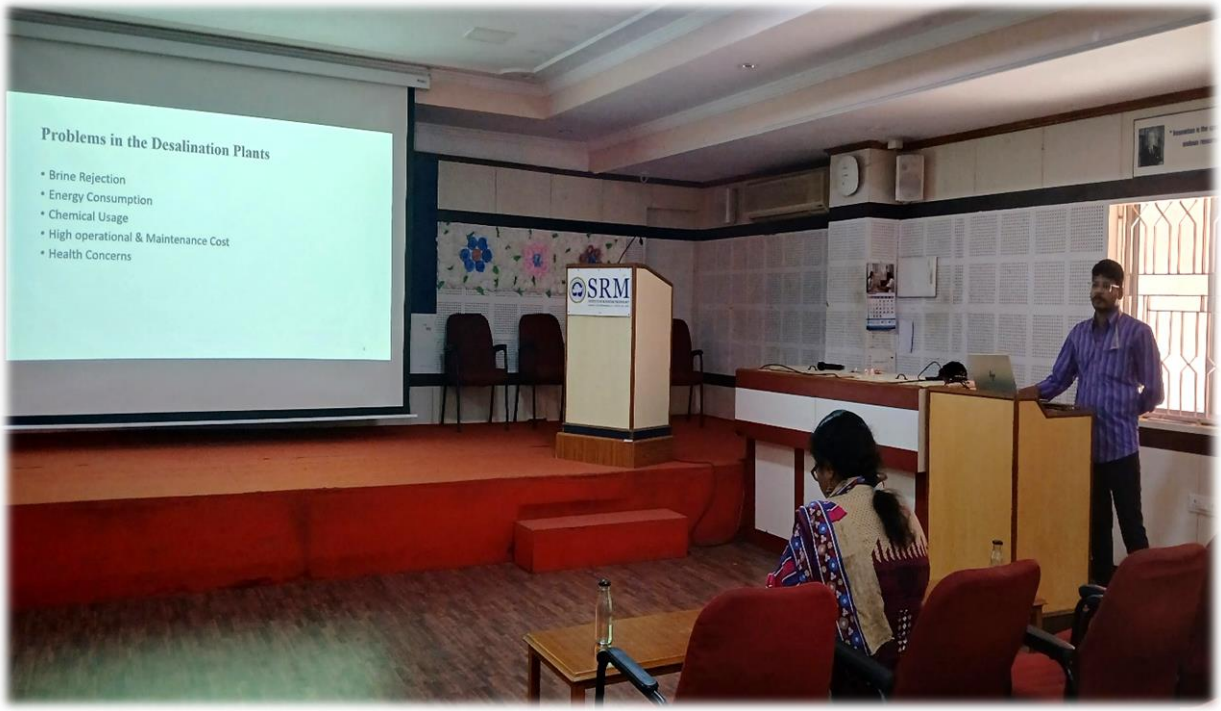


Launching of India's first saline water lantern ROSHNI

4. PRESENTATION SESSION

The Earth Day occasion, provided the participants an excellent opportunity to raise awareness about environmental issues and promote sustainable practices. Several topics which were covered in the presentation were Bioremediation of Polycyclic aromatic hydrocarbons in oil spilled water using Bioreactor, Endocrine-Disrupting Potential of Bisphenol A and its Derivatives: An In Silico Study on Amino Acid Binding Site Classification and Zebrafish Model Validation, Development of Non-Asbestos brake friction material for EV applications, A sustainable method of desalination using stacked layer filtration and magnetism, Toxic and Essential Element Contamination in Urban and Peri-Urban Indian Food Baskets: Sources, Dietary Exposure, and Health Risk Assessment, exploring beta-cell regeneration in zebrafish embryos: the rescue potential of folic acid against alloxan toxicity. The session was judged by Dr. S. Prabhakar and Dr. Muthamilselvi P. Through engaging visuals, real-world data, and actionable tips, presenters may inspire individuals, schools, and communities to make eco-friendly choices.

Participants presenting the topics



Participants presenting the topics

5. VALEDICTORY CEREMONY

5.1 Felicitation of Dr. Purnima Jalihal with Lifetime Achievement award

Dr. Purnima Jalihal, served as senior scientist in the National Institute of Ocean Technology (NIOT) was felicitated with Lifetime Achievement award for her vital role and significant contribution in the field of ocean technology, particularly in the development of ocean energy and desalination systems. She has headed the Energy and Freshwater group at NIOT and has been instrumental in pioneering projects like the ocean thermal gradient-based desalination plant in Lakshadweep, which addressed the critical need for drinking water on Kavaratti Island. Her work also focuses on developing both small-scale off-grid ocean energy systems and large-scale structures to meet clean energy goals.

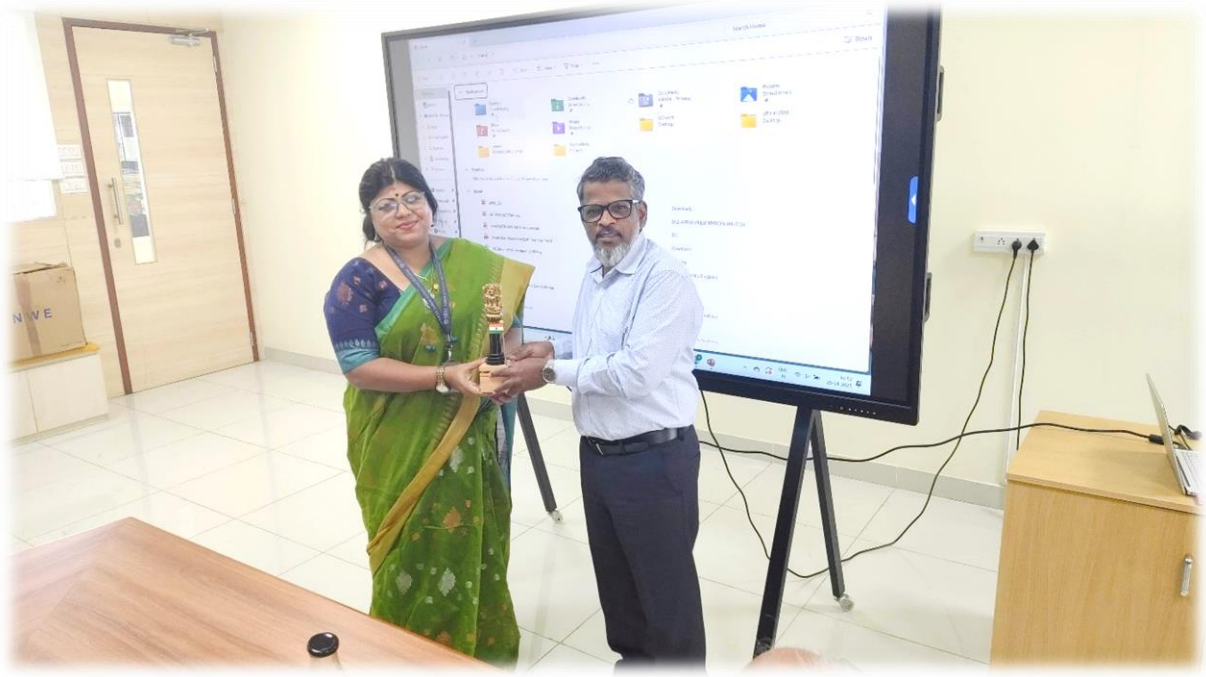
Dr. Purnima Jalihal was felicitated with Lifetime Achievement Award for her immense and substantial contribution in the field of Ocean Technology

5.2 Closing Remarks and Prize distribution

The Valedictory function was led by Dr. Paromita Chakraborty, in the presence of Chief Guest Dr. Purnima Jalihal, Dr. S. Prabhakar and Dr. Muthamilselvi P. Prizes were distributed to the awardees bagging First, Second and Third Prize in the PowerPoint session. Participation and Organising certificates were provided to all participants and organising committee members. The Program ended with a message to protect the planet from raising environmental issues and to preserve its serenity through sustainable ways for a better future. By taking part in activities like cleaning our local environment, planting trees, adopting RRR strategy we're making our world a happier, healthier place to live.

Award Distribution to Prize Winners

Felicitation of Keynote Speakers of the Workshop



Felicitation of Dr. G. Arthanareeswaran by Dr. Paromita Chakraborty

Felicitation of Dr. S. Vishali by Dr. S. Prabhakar

Felicitation of Dr. Sanjay Mehta by Dr. S. Prabhakar

Earth Day Workshop Organising Committee Members with Chief Gust and Keynote speakers

"A Better environment- A Better Tomorrow- Save the Planet"