2020-21

ANNUAL REPORT

iFOREST

INTERNATIONAL
FORUM
FOR ENVIRONMENT,
SUSTAINABILITY
& TECHNOLOGY

CONTENTS

Message from the Chairperson and President

The year 2020-21 has been exciting yet challenging for the International Forum for Environment, Sustainability and Technology (iFOREST) and one of tremendous learning. The organisation was less than six months old when COVID struck. As a new organisation, we needed to step up on multiple fronts in the wake of the pandemic — ensuring the health and safety of our team members, supporting them to stay inspired and productive in the new normal, and rethinking our agenda and strategy as the urgency for climate and environmental action became greater than ever before.

Despite the pandemic-induced challenges, iFOREST made some significant contributions to the field of environment and climate change. Of special mention here is our work on just transition, climate legislation, natural refrigerants and plastic waste management.

Our book on just transition is the first-of-its-kind on-ground research from India on what transitioning away from the coal economy means and entails for the country. We believe this work is only the beginning to facilitate a wider and much-needed discussion on just transition policies and strategies for India and the world.

Our report on framework climate legislation, again a first of its kind in India, explored the use of domestic legal mechanisms to enhance climate ambition and meet international climate change commitments. This report has spurred major discussions in the country on the need to enact a framework climate legislation.

iFOREST also worked with the Bureau of Indian Standards (BIS) and industry partners to come out with India's first safety standards on natural refrigerants. Two standards were published during the year. The first was the national safety standards for Closed-Circuit Ammonia Refrigeration Systems, essential for India, as it allows safe use of ammonia in cold storage applications for the agriculture sector. The second was the adoption of IEC 60335-2-40 (2018). IEC 60335-2-40 prescribes safety standards for all types of refrigerants used in heat pumps and air-conditioners, including R290 (Propane) in household air-conditioners. This standard is crucial to enable Indian companies to use R290 in air-conditioners, which will lead to higher energy efficiency and lower emissions of greenhouse gases and ozone-depleting substances.

With respect to waste management, our team has done some pioneering work, including developing and demonstrating a robust methodology for inventorising solid waste, even plastic waste. The solid and plastic waste inventory developed for Rishikesh and Haridwar provides a model for other cities to emulate and develop a robust waste management system. The team also undertook a comprehensive assessment of the single-use plastic ban in the country and helped the UN Environment Programme undertake a comprehensive assessment of various aspects of waste and chemicals data in India, including evaluation of waste and chemicals-related Sustainable Development Goal (SDG) indicators. The team members also supported the UN Environment Programme in its work on marine plastic litter.

iFOREST has also worked extensively on building policy and public engagement on important environmental issues. We have tracked policy developments on various environmental and social issues and written actively on them in India's leading magazines and newspapers to enrich the public discourse on these topics. Our experts have also been invited on national and international discussion platforms for engaging on pressing issues of net-zero commitments, just transition, air pollution, and also on pathways for a green recovery from the COVID crisis.

In 2019, we set up iFOREST to innovate on policies and practices, and use technology effectively to ensure rapid and transformative changes in our environmental and social relations. The past year has only shown us how important this is. Along with our fraternity, we as an environmental organisation shall strive to achieve this in the coming years. As we grow, we will build on our research that is relevant and critical to policy-making, and enhance our public engagement to create an impact at local as well as global scale.

We are thankful to our partners for their support and trust in us.

Raghunath Anant Mashelkar

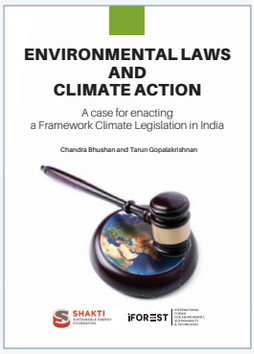
Chairperson

Chandra Bhushan

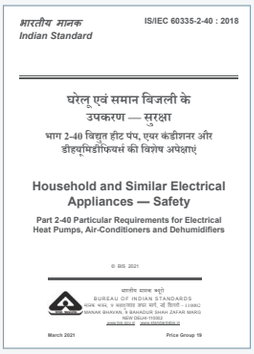
CEO & President

Highlights of the year

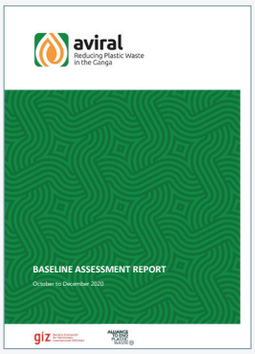
1 Just Transition in India



2 Framework climate legislation

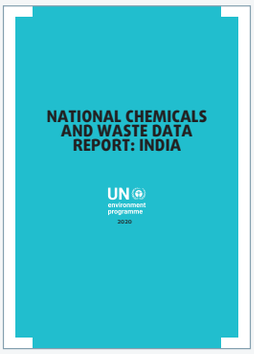


3 Safety standards

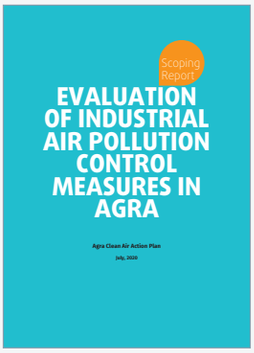


4 Methodology for solid and plastic waste inventory

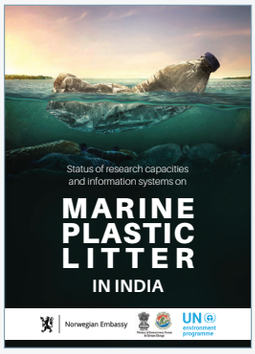
5 Single Use Plastic Report



6 India chemical and waste profile



7 Air pollution in Agra



8 State of research and institutional capacity on marine litter

National Knowledge Network

9 Member, National Knowledge Network and Institute of Repute

Our vision

In the last 150 years, humankind has made unprecedented social and material progress. We have had unparalleled advances in health care, education, human rights and technological development that have brought great benefits to the society. Although the benefits have been inequitable, we are more literate, less poor, less violent, freer, and live longer than ever before in our history. Material benefits have accompanied social advancement. Today, democracy, the rule of law, and personal, economic and political liberties are considered universal values by most.

But this progress has come at the cost of Earth's ecological and biophysical systems. The scale of human exploitation of natural resources is now threatening the very survival of the world.

While the odds are stacking up against us, we at iFOREST strongly believe that humanity has the ingenuity, and the social, economic and technological means to make life better for all and protect the natural world. We strive to be agents of change by initiating and promoting efforts to reduce the ecological footprint and environmental externalities of humankind. We will develop and support social and economic models that allow inclusive development and innovate scientific and technological solutions to meet the needs of the current and future generations. We endeavour to make environmentalism an integral part of the progressive social movement.

This is our pledge and programme.

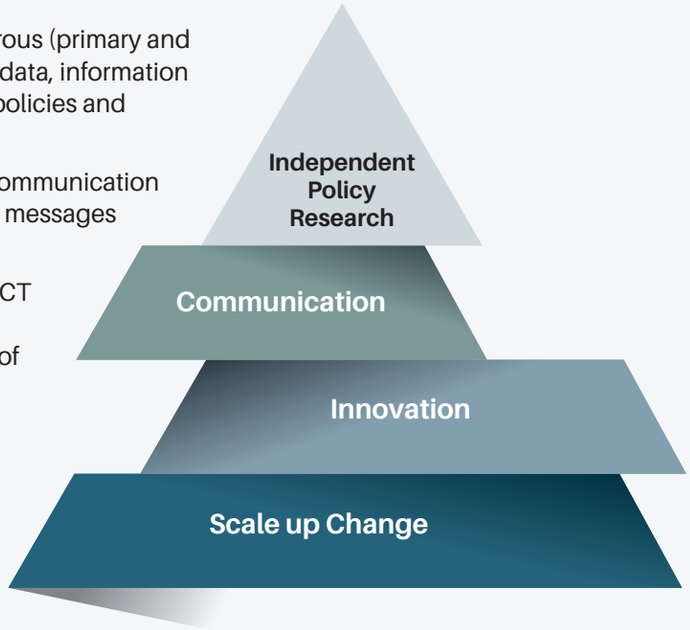
Approach

Research: Independent and rigorous (primary and secondary) research, to generate data, information and knowledge, enabling better policies and practices

Communication: A compelling communication strategy that takes environmental messages from a few to the many

Innovation: Use of cutting-edge ICT tools to address information and capacity gaps, including in areas of environmental governance.

Scale up Change: Building synergy and partnership in all areas — research, communication, advocacy and campaign — to scale up solutions.



Initiatives

Energy and Climate Change

Our work on energy and climate change is focused on enabling a just transition of fossil fuel-dependent regions and communities as the climate crisis deepens and technological innovations make low-carbon and zero-carbon technologies available. We are also working on promoting natural refrigerants and energy efficiency in the Refrigeration and Air-conditioning (RAC) sector. Our objective is to catalyse an ambitious climate mitigation goal and strategy within India and engage in the international climate change negotiations to push for an equitable and ambitious global mitigation outcome.

Pollution & Waste Management

Sustainable consumption and production lie at the heart of pollution and waste management. Our programmes focus on managing waste and pollution through better governance, improved capacity and smart and affordable technology. We also strongly focus on citizens' awareness and engagement on lifestyle changes, as we believe change should begin at home.

Natural Resource Management

India's natural resources, if managed sustainably, have tremendous potential to strengthen the country's economic base, reduce distress migration, protect ecologically sensitive areas, as well as deal with overarching issues of land degradation, water scarcity and climate change. We encourage a people-centric approach to achieve this by building on the strength of our laws and technology to reach out to the grassroots

Green Economy

Our green economy initiative focuses on engaging businesses, especially the financial sector, to mainstream environmental protection and climate change concerns in their decision-making processes. We undertake independent research on the environment and social performance of companies and provide data and information to understand the financial risks posed by environmental threats, including climate change. We also work on circular economy and promote green growth.

Energy & Climate Change

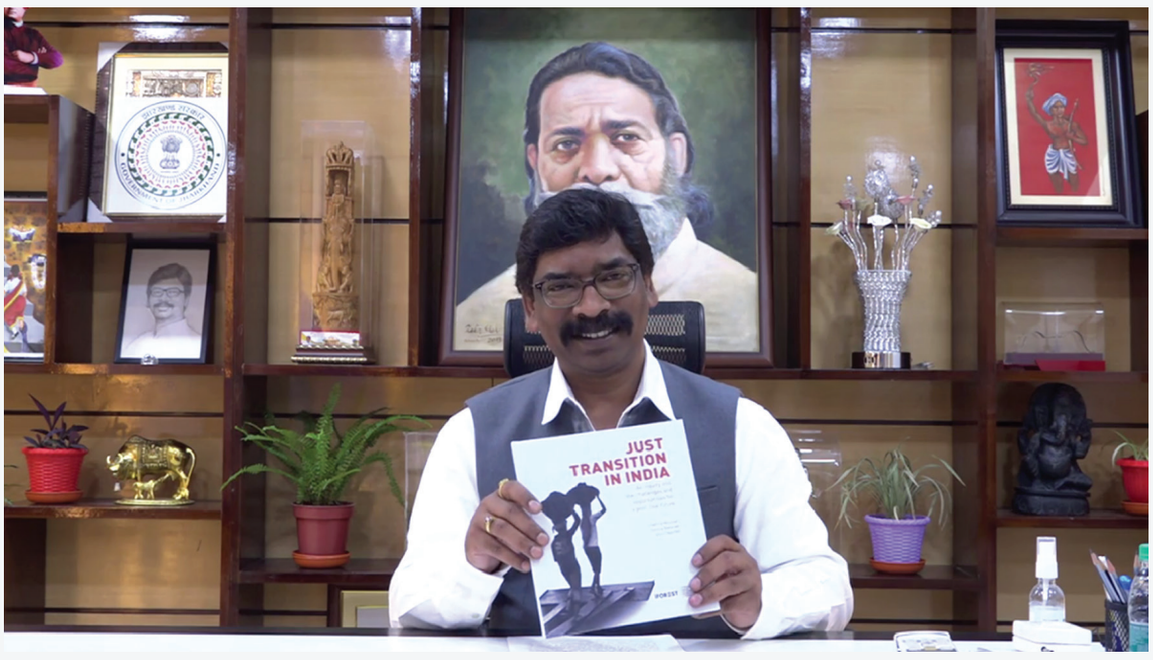
Just Transition in India

"The support and enthusiasm that we have received from various people, from local to national and international level, has been extremely encouraging to take forward this agenda."

- **Srestha Banerjee**

'Just transition' has emerged as an important component of climate change-mitigation strategy worldwide since the Paris Agreement in 2015. In the face of the growing climate crisis, and for meeting the target of net-zero emissions by 2050, a transition away from fossil fuels like coal has become inevitable. However, there are social consequences of this transition: a fundamental concern is about the fate of fossil fuel-industry workers and the local communities dependent on it. Just transition as a policy and planning concept tries to address this. Its basic idea is to ensure alternative livelihood for these people by boosting sustainable economic opportunities and improving social infrastructure to build community resilience for a transition.

Over the past few years, countries in the global North have come up with just transition policies and plans. However, India has so far not engaged nationally or internationally on just transition because of its high dependence on coal for energy security and industrial growth. But the situation is changing rapidly, and coal mines are being shut down in an



"The strength of our work on just transition is that we have been able to capture the perspectives of stakeholders who will be most affected by coal mine closure."

- Shruti Agarwal

unplanned fashion due to various factors, including unprofitability.

In 2020-21, we undertook a detailed study on why India must engage in just transition and what it means for the country to transition away from the coal economy and build sustainable and equitable economies in its place. The study entailed an in-depth assessment of the implications of coal mine closure in one of Jharkhand's top coal mining districts – Ramgarh. It became clear from the study that unplanned mine closure will lead to major socio-economic and environmental disruptions in the district and that energy transition and just transition must go hand in hand.

The study's findings have been published in our book titled ***Just Transition in India: An inquiry into the challenges and opportunities for a post-coal future***. The book also proposes a planning and an indicative policy framework for just transition in India's coal regions.

We had the honour of having our book released by the Chief Minister of Jharkhand — the state with the largest share of coal reserves in India. In the subsequent webinars and meetings that we organised on just transition, we saw participation from a diverse set of stakeholders, including political and industry representatives, academia, environmental and public policy think-tanks and civil society organisations. Our book has also been well received by various people and organisations nationally and internationally, including policy makers and public representatives, multilateral institutions, academicians, and prominent media houses.

We have been inspired and energised by the overall enthusiasm of all stakeholders on our forward-looking work and will continue to work towards building public and policy engagement on just transition in India in the years to come.

The project was supported by Children's Investment Fund Foundation and iFOREST worked as a knowledge partner on it.

Framework Climate Legislation for India

Climate treaties lack enforcement mechanism — there is no international police or emissions regulator, and international courts' jurisdiction is very limited. When countries withdraw from these treaties or fail to adhere to their emission-reduction targets, not much can be done. Legally binding effect can be achieved only through Acts of Parliament or state legislatures. India has several climate-relevant legislations, including on environmental protection, forest management, electricity, and mining and climate-specific action plans. Indian courts have also seen some litigation that references climate concerns. However, India does not yet have a climate-specific framework legislation unlike some countries such as the United Kingdom, Mexico and Germany.

"This report is a timely one to revisit the question whether India needs a climate law to improve coordination and predictability in climate action."

- **Tarun Gopalakrishnan**

With funding support from Shakti Sustainable Energy Foundation, we undertook research to understand if litigation in Indian courts had resulted in an ambitious Indian climate policy and whether existing policies and plans are sufficient for ambitious climate action in the country. We also elicited the views of experts on the need for a climate legislation in India, and the desirable design elements in such a legislation.

Through an in-depth analysis in three inter-related areas — climate litigation, framework climate legislations from around the world, and existing national laws on environment, energy, and natural resources — our research has identified major gaps in climate change-related law and policies in India. We argue, based on our findings, that there is a need for a framework climate legislation to provide vision, coordination, target and predictability to mainstream climate change mitigation and adaptation in the country.

In February, our report containing the findings and recommendations of our research and titled *Environmental Laws and Climate Action: A case for enacting a framework climate legislation in India* was released by Shri Jairam Ramesh, Member of Parliament, Rajya Sabha and ex-Minister of Environment, Forest and Climate Change. We organised a panel discussion on the topic on the occasion of the report release as well as a roundtable subsequently with young environmentalists and legal professionals. Both these events brought out extremely valuable insights and the need to continue engaging on the subject collaboratively.

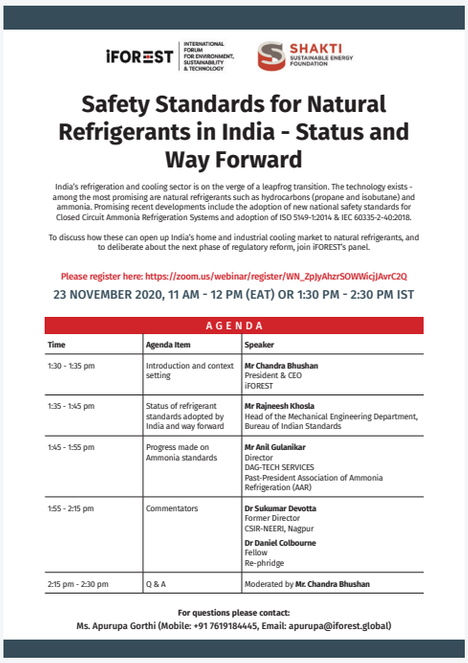
Green Cooling and Energy Efficiency

India's cooling needs for human productivity, food security and healthcare are growing rapidly, posing a dual threat for climate change. The first is from the greenhouse gas (GHG) emissions from fossil fuel-based energy required for cooling and the second from high Global Warming Potential (GWP) refrigerants like hydrofluorocarbons (HFC). India's commitment to phase down high-GWP HFCs under the Kigali Amendment to Montreal Protocol is scheduled to begin in 2028. Meanwhile, the India Cooling Action Plan (ICAP) rolled out in 2019 sets ambitious targets for reducing cooling and energy demand over the next 20 years. Our work is focused on creating a multi-faceted approach to achieving green cooling, covering energy efficiency, natural refrigerants and not-in-kind technologies.

"The adoption of safety standards for natural refrigerants is a significant step towards climate action and we are so excited to have contributed to it."

- Apurupa Gorthi

In the past year, through a project funded by Shakti Sustainable Energy Foundation, iFOREST contributed significantly to the natural refrigerant and not-in-kind technology development in India. First, iFOREST played a seminal role in the adoption of safety standards for natural refrigerants by the Bureau of Indian Standards (BIS). This allows the safe use of climate-friendly natural refrigerants like R290 (Propane) and Ammonia in a variety of cooling applications. A webinar was organised as part of the Montreal Protocol's COP12/MOP 32 side-event to discuss the implications of these safety standards on natural refrigerant technology in India.



iFOREST INTERNATIONAL FORUM FOR ENVIRONMENT, SUSTAINABILITY & TECHNOLOGY

SHAKTI SUSTAINABLE ENERGY FOUNDATION

Safety Standards for Natural Refrigerants in India - Status and Way Forward

India's refrigeration and cooling sector is on the verge of a leapfrog transition. The technology exists - among the most promising are natural refrigerants such as hydrocarbons (propane and isobutane) and ammonia. Promising recent developments include the adoption of new national safety standards for Closed Circuit Ammonia Refrigeration Systems and adoption of ISO 5149-1:2014 & IEC 60335-2-40:2018.

To discuss how these can open up India's home and industrial cooling market to natural refrigerants, and to deliberate about the next phase of regulatory reform, join iFOREST's panel.

Please register here: https://zoom.us/webinar/register/WN_ZplyAhzrSOWWicjJAvrC2Q

23 NOVEMBER 2020, 11 AM - 12 PM (EAT) OR 1:30 PM - 2:30 PM IST

AGENDA

Time	Agenda Item	Speaker
1:30 - 1:35 pm	Introduction and context setting	**Mr Chandra Bhushan** President & CEO iFOREST
1:35 - 1:45 pm	Status of refrigerant standards adopted by India and way forward	**Mr Rajneesh Khosla** Head of the Mechanical Engineering Department, Bureau of Indian Standards
1:45 - 1:55 pm	Progress made on Ammonia standards	**Mr Anil Gulanikar** Director DAG-TECH SERVICES Past-President Association of Ammonia Refrigeration (AAR)
1:55 - 2:15 pm	Commentators	**Dr Sukumar Devotta** Former Director CSIR-NEERI, Nagpur **Dr Daniel Colbourne** Fellow Re-phridge
2:15 pm - 2:30 pm	Q & A	Moderated by **Mr. Chandra Bhushan**

For questions please contact:
Ms. Apurupa Gorthi (Mobile: +91 7619184445, Email: apurupa@iforest.global)

Secondly, through interactions with a diverse set of stakeholders in the cooling industry, iFOREST is creating a coalition among policymakers, researchers, engineers, architects, consultants, and industry personnel for promoting low-GWP and natural refrigerants.

In the third and final vertical, iFOREST's research aims to develop policy and guidelines for funding the transition to energy-efficient and low-GWP refrigerant technologies. A key outcome of this effort is to create momentum around leapfrogging to climate-friendly cooling technologies, thus pushing for achieving the targets of the Montreal Protocol.

Pollution & Waste Management

Plastic Waste inventory of Haridwar and Rishikesh

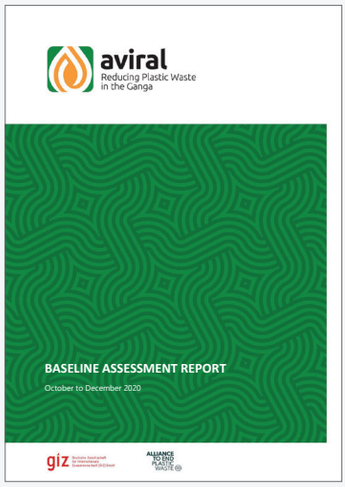
It is common knowledge that solid waste management practices in India's cities are not up to the mark and the amount of plastic waste has increased drastically in recent years. Along the river Ganga, the Hindu pilgrimage and cultural cities of Haridwar and Rishikesh are witnessing unmanageable amounts of plastic waste due to a boom in tourism. In 2020, the Alliance to End Plastic Waste (the Alliance) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), launched a project to reduce the amount of plastic waste entering the river Ganga at Haridwar and Rishikesh.

"Our methodology is robust and has been tested in Haridwar and Rishikesh. It should be replicated in other cities to improve plastic waste management."

- Rahul

iFOREST supported GIZ as a knowledge partner for the solid and plastic waste baseline assessment study in Haridwar and Rishikesh. The study's objective was to carry out a detailed assessment of plastic waste flows and existing plastic waste management practices and trends in both cities and identify gaps and barriers for sustainable plastic waste management and potential areas of intervention.

The baseline assessment included three specific yet interconnected studies. The first was to understand the current status of waste management in the city, which included evaluating the past and current initiatives, population and source enumeration, the current status of waste management systems and infrastructure, and mapping the informal sector and plastic waste value chain. The second study was on waste quantification and characterisation, including developing the solid and plastic waste inventory and assessing the plastic typology. The third study was on stakeholder perception, knowledge, and capacity assessment, which included a survey of households and commercial entities and identifying capacity building needs of various stakeholders. The study's findings are being used to develop city-specific plastic waste management action plans for Haridwar and Rishikesh.



As there is no standard methodology to develop solid and plastic waste inventory in the country, the iFOREST team developed an India-specific methodology based on best practices from other developing countries and successfully tested the methodology in Rishikesh and Haridwar. This study is the first of its kind where the actual composition of plastic waste and its characterisation has been done. Before our baseline study, only estimates-based analysis had existed for calculating plastic composition in waste streams.

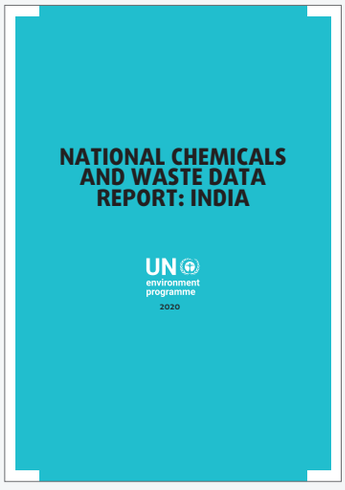
It is essential that every city in the country develops solid and plastic waste inventory to understand the composition, quantity, and characteristics of wastes. Without an inventory, developing a waste management system is like shooting in the dark.

Chemical and Waste profile of India

India has made strides in developing a robust legislative framework to collect, collate and report data on various waste streams and chemicals. There exist separate regulations on the management of different waste streams. Two priority waste streams — solid waste and plastic waste — are being addressed through strategies such as Swachh Bharat Mission, elimination of single-use plastic and enforcement of Extended Producer Responsibility. India is also party to several Multilateral Environmental Agreements (MEAs) related to waste and chemicals and to the Strategic Approach to International Chemicals Management (SAICM) initiative, a policy framework to promote chemical safety around the world. These regulations, missions and MEAs have contributed to an elaborate system of data generation, collection and reporting on waste and chemicals and a vast amount of data is generated on the management of waste and chemicals in the country. However, there are major gaps/challenges in terms of waste management data generation, collection and reporting.

"Comprehensive assessments of the performance of chemical and waste management frameworks are lacking in our country. This study brings one of the first assessments from India on chemical and waste-related SDG indicators."

- Chandra Bhushan



In 2020-21, we undertook a comprehensive assessment of various aspects of waste and chemicals data in India, including the estimation of performance of waste and chemicals-related Sustainable Development Goal (SDG) indicators, and published an assessment report. We are confident that the report will help policymakers and administrators to improve on collection and management of data, improve reporting against various national regulations and MEAs, and overall contribute to better waste management practices in the country for a cleaner and safer environment, human health and well-being, and meet the SDG targets.

iFOREST worked as a knowledge partner for UN Environment Programme on this project.

Plastic Waste & Marine Litter in India

Plastic pollution is one of the major environmental issues that the world and India are trying to grapple with. Each year at least 8 million tonnes of plastic waste enters the oceans, of which 80% comes from land-based sources. India is currently considered the twelfth-largest source of marine litter and is predicted to become the fifth-largest by 2025. The country produces nearly 26,000 tonnes of plastic waste every day, making it the fifteenth-largest plastic polluter in the world. Studies have shown that a significant portion of plastic waste entering the ocean is single-use plastics (SUPs).

During the year, the iFOREST team was deeply involved in studying the impact of the SUPs ban across the country and the state of knowledge on marine plastic litter in India. We have published two seminal reports on plastic pollution in India.

The first report is a country-wide analysis of the status of single-use plastic regulation, implementation, and compliance in India. This report evaluates the status of regulations on SUPs and their implementation across the 36 states and UTs of India. The evaluation of the SUP ban was approached through a critical analysis of the regulations/notifications/executive orders of various states/UTs, considering certain indicators. These included the timeframe of the ban, SUP products and activities that were prohibited, and those exempt, enforcement mechanisms, and instruments used to improve compliance. Further, an in-depth review of five states/UTs, namely, Maharashtra, Kerala, Odisha, Sikkim, and Delhi, was undertaken to study best practices and understand the challenges in enforcing the SUP ban among various stakeholder groups. This report will help the country design a better policy framework on SUPs.

The second report, titled "Status of research capacities and information systems on marine plastic litter in India," presents the state knowledge and the capacities of research institutions on marine plastic litter. The report has identified the gaps in knowledge and capacity gaps in key research institutions to conduct research on marine debris through a systematic literature review and stakeholder interviews.

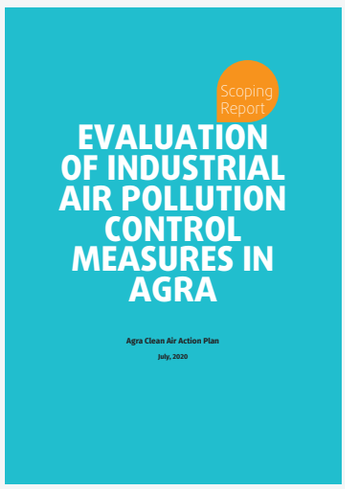
For both these reports, iFOREST supported the UN Environment Programme as a knowledge partner.

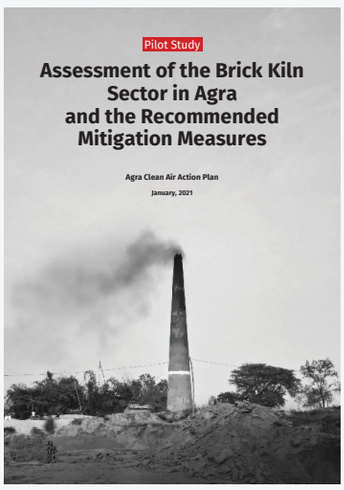
Industrial Air Pollution in Agra

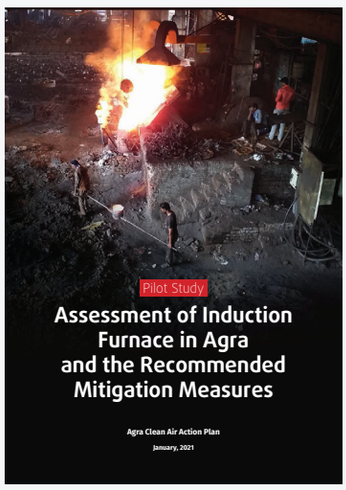
Agra is one of the 122 non-attainment cities covered under the comprehensive pan-India pollution abatement strategy of the National Clean Air Programme (NCAP). In 2020-21, we undertook a study on industrial air pollution control measures in Agra to strengthen the action plan for control of air pollution. The project was designed to assess the major sources of industrial pollution in Agra air-shed, the status of air, existing control measures and develop an action plan for key industrial sectors where interventions could result in a significant reduction in air pollution levels.

Our scoping study found that technology interventions in induction furnaces and brick kilns hold significant potential to reduce industrial air pollution in Agra air-shed. We, therefore, conducted pilot studies on reducing air pollution from induction furnaces and brick kiln. The pilot studies provide detailed roadmaps for pollution reduction in these two sectors, including technical specifications, design and cost requirements for pollution control equipment, and policy and regulatory measures required for implementation.

iFOREST team members worked as a knowledge partner for UN Environment Programme on this project.







Training and capacity building

The iFOREST team has conducted more than 100 training programmes on a wide array of environmental and development issues. We have training resources and a network of experts with vast experience in delivering training on environmental and social impact assessment, land acquisition, environmental health and safety and social safeguards, sustainable waste management and circular economy, and industrial pollution monitoring and compliance enforcement.

"We have been successful in adapting our modules for online training programmes without compromising on learning outcomes."

- Sujit Kumar Singh

During the pandemic, we designed and organised online training for a diverse set of stakeholders, including regulatory authorities such as State Pollution Control Boards, Department of Water Supply and Sanitation, Government of Punjab, environmental consultants, and researchers, and students. We also developed customised training for the industry. A brief snapshot of the training and capacity building programmes in 2020-21 is provided below:

Programme	Participants
Environmental Safeguards for Groundwater Resources	Department of Water Supply and Sanitation, Government of Punjab
Environmental Safeguards for Surface Water Supply Schemes	Department of Water Supply and Sanitation, Government of Punjab
Social Safeguards for Surface Water Supply Schemes	Department of Water Supply and Sanitation, Government of Punjab
Real time air pollution monitoring – CEMS & CAAQMS	Odisha State Pollution Control Board
Environmental Impact Assessment and Compliance Assurance in Mines	MOIL India, Ministry of Steel, Government of India
Environmental Impact Assessment of Mining Projects	Kerala Pollution Control Board, Chhattisgarh Pollution Control Board, Western Coalfield Limited (Subsidiary of Coal India, Ministry of Coal) and other stakeholders
Environment Management and Compliance Assurance in Mines	Goa Pollution Control Board, Chhattisgarh Pollution Control Board, NALCO and Hindustan Copper (Ministry of Mine) and other stakeholders
Integrated Waste Management	Department of Water Supply and Sanitation, Government of Punjab
Standardised data collection and reporting on waste	State Pollution Control Boards (in partnership with UNEP)

Engagement & Outreach

Communication and engagement

The year 2020-21 saw reforms in environmental governance in India, including the adoption of safety standards for natural refrigerants, the introduction of the draft Arctic policy and the draft Environment Impact Assessment notification, commercialization of coal mining and proposal to revise the rules and guidelines pertaining to District Mineral Foundation. We have been tracking these developments closely and writing actively on them in different mediums, including India's leading newspapers such as The Times of India and Outlook India to contribute to public knowledge on these subjects. Our research has also received extensive media coverage in some of India's most popular media channels.

India's Arctic policy must push Western countries to give up double standards

Chandra Bhushan

'We need to act for the Amazon and act for our planet,' said Canadian Prime Minister Justin Trudeau when fires ravaged the Amazon rainforest in August 2019. He was joined by many Western countries in preaching the virtues of protecting the 'global common' for combating climate change.

But the Western world's concern for the global commons seems to limit itself, so far, to the sensitive ecosystems in the southern hemisphere. Thus, there is an international treaty to protect the Antarctic, which puts an indefinite ban on mining and hydrocarbon extraction. Furthermore, there is a long-standing demand, pushed by the G7 countries, for an international treaty to protect the tropical forests because they are the most biodiverse regions and 'Lungs of Earth'.

However, when it comes to the northern hemisphere ecosystems, the same countries reject any international intervention. The Arctic is a classic case of this double standard. In 2008, the five coastal states of the Arctic Ocean (United States, Russia, Canada, Norway and Denmark) vowed to block any "new comprehensive international legal regime to govern the Arctic Ocean" in the Ilulissat Declaration.

The Arctic is essential for the stability of the earth's climate, arguably even more than the Antarctic. Its sea ice helps moderate the global climate. In turn, it is also very sensitive to changes in climate. Consequently, the Arctic is warming more rapidly than the global average, and its sea ice has decreased dramatically since the late 1970s.

The warming of the Arctic is also speeding the melting of the Greenland ice sheet. Recent studies indicate that Greenland's ice is melting on average seven times faster today than in the 1990s. Therefore, the changes in the Arctic have massive ramifications on sea level rise, aquatic ecosystems, and weather patterns across the world, including the monsoon.

But the sea ice melting has also opened up the fabled Northwest Passage, significantly shortening the route between the Atlantic and Pacific Oceans. In addition, Arctic seabed is now accessible for oil and gas extraction and deep-sea mining. As an estimated 40% of current global oil and gas reserves are in this region, there is a scramble over shipping lanes and resources, especially between the Arctic states. But other countries are also staking claim over the region's resources, especially China.

India is an observer at the Arctic Council and has recently released a draft Arctic policy. Regrettably, the draft policy lacks objectivity. It is an 'all-of-the-above' policy with contradictory goals. On the one hand, the policy envisions India's role in exploring and exploiting hydrocarbon and encourages investments by Indian companies. On the other hand, it also expresses deep concerns regarding the impacts on the country due to the changes in the Arctic, including on the monsoon, and proposes a slew of research activities. In conclusion, the draft terms the Arctic as 'the common heritage of mankind' and calls for 'sustainable, responsible and transparent' human activity.

India's Arctic policy should push for an international legal mechanism, similar to the Antarctic treaty, and save the Arctic's pristine ecosystem and earth's climate. In this endeavour, it might find allies in the Biden administration

But 'sustainable, responsible and transparent' exploitation of the Arctic is an oxymoron. It is impossible to take out oil and gas, burn them, and still keep global warming under check, or open the international shipping lane and expect the ocean to remain pristine. The irony is that the world's wealthiest people, living in the already wealthy Arctic states, will gain the most by exploiting the resources. However, the costs will be borne by the world's poorest, living in the coastal areas of the global South.

If India wants to be a serious player in the Arctic, then its policy must address this irony and the double standards of the Arctic states. It is important to realise that we made a mistake by becoming an observer in the Arctic Council, thereby accepting the Arctic states' sovereign right over the Arctic ocean. We will repeat the error if we join them in exploiting the Arctic.

The bottom line is that India will not gain economically but is likely to lose massively due to coastal flooding, monsoon disruptions and changes in the ocean systems. Therefore, India's Arctic policy should push for an international legal mechanism, similar to the Antarctic treaty, and save the Arctic's pristine ecosystem and earth's climate. In this endeavour, it might find allies in the Biden administration, which has just cancelled the Arctic Refuge oil programme and Keystone pipeline.

The writer is CEO, International Forum for Environment, Sustainability and Technology (iFOREST)

As expert members in a number of government constituted committees, including National Knowledge Network, implementation committee for National Clean Air Programme, MED-03 (BIS) and so on, our team is also supporting the Government of India towards building a knowledge society and tackling the air pollution and climate change crisis in the country.

National Knowledge Network, Government of India.

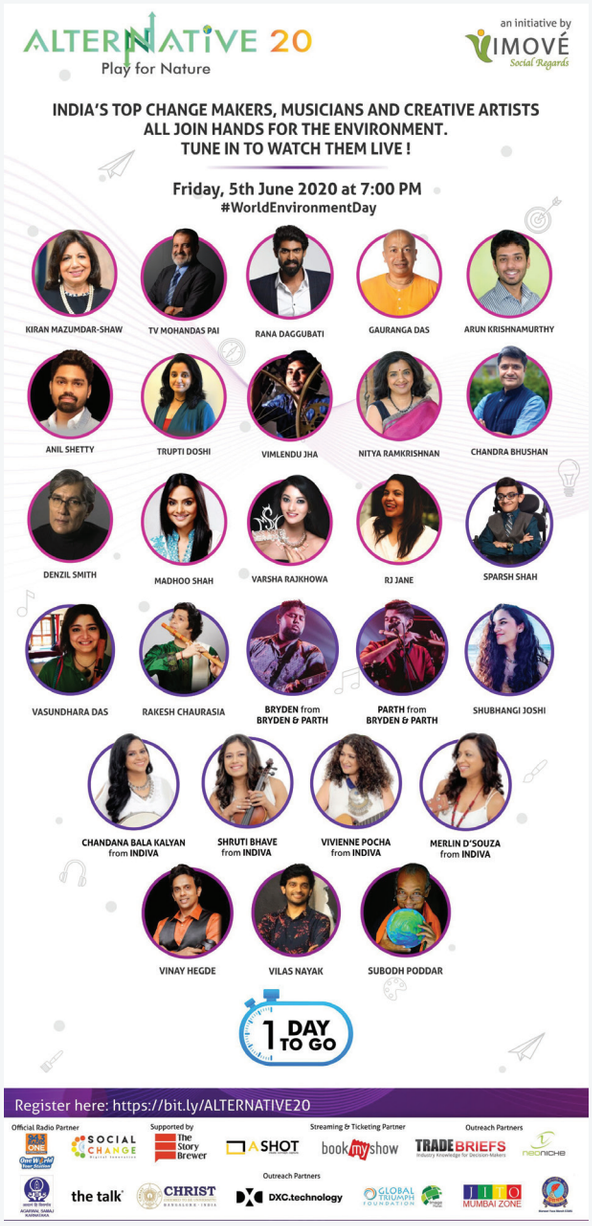
National Brick Mission, Government of India

MED 3, Refrigeration And Air Conditioning Sectional Committee, Bureau of Indian Standards

Just Transition Initiative Advisory Board, Center for Strategic and International Studies (CSIS)

Our team members have been invited to share their perspectives and expertise at several national and international events on issues of environmental governance and climate justice. A list of the key events where our team members participated in 2020-21 is provided below:

- Podcast on *Just Transition Initiatives* organised by World Bank
- Conference on *'Energy Transition: Visions for the Future'* organised by Norwegian government
- Webinar on *Extended Producer Responsibility* organised by WeCare
- Webinar on *Economic Uncertainties and a Just Transition for India's Coal Mining Sector* organised by Initiative for Sustainable Energy Policy, John Hopkins University
- Webinar on *Prospects for Energy Transition in India to meet Climate Targets* organised by O.P.Jindal Global University
- *Alternative 20 Initiative* organised by Vimove Foundation
- Webinar on *Managing Air Quality in Commonwealth countries* organised by The Ramphal Institute
- Lecture on *Ensuring justice through people-centric resource governance and benefit-sharing in India's mining areas* organised by Tata Institute of Social Sciences



Supporting policy development and implementation

As expert members in a number of government-constituted committees, including National Knowledge Network, National Brick Mission, Bureau of Indian Standards and so on, our team is supporting the Government of India towards building a knowledge society and tackling the pollution and climate change crisis in the country. We are also a member of the Just Transition Advisory Board of the Just Transition Initiative started by The Center for Strategic and International Studies (CSIS) and Climate Investment Fund (CIF, World Bank).

The iFOREST team is part of the following committees/advisory panel:

» Steering Committee Member, National Brick Industry Mission, Bureau of Energy Efficiency, Ministry of Power, Government of India.

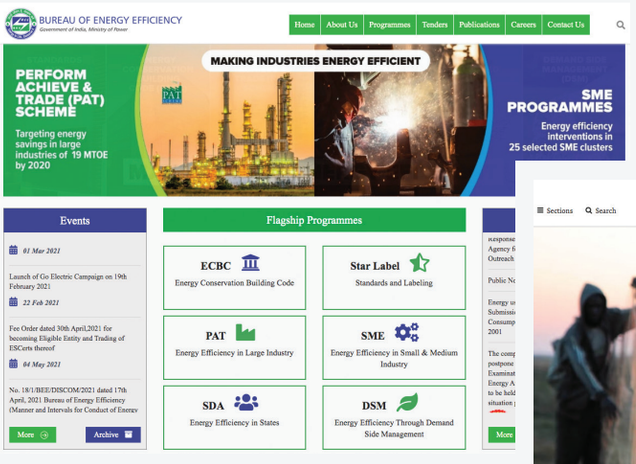
» Technical Guide & Expert, Research on implementation of environment and wildlife laws in Jharkhand (in light of the judgement of the Honourable High Court of Jharkhand – BA No. 387 of 2019), Department of Justice, Government of India

» Member, National Knowledge Network (NKN) to implement National Clean Air Programme

» Institute of Repute (IoR) for Patna, Ranchi, Dhanbad and Jamshedpur to support the implementation of National Clean Air Action Programme.

» Member, MED-03 MED 3, Refrigeration And Air Conditioning Sectional Committee, Bureau of Indian Standards

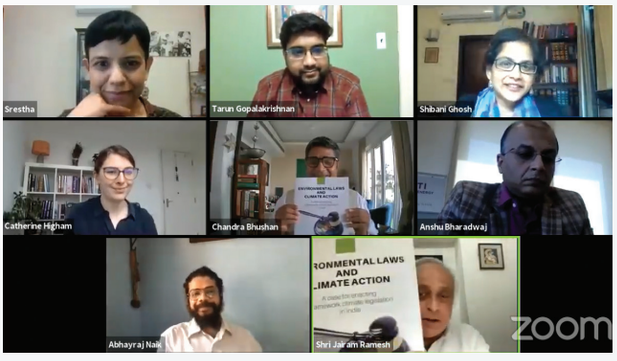
» Just Transition Advisory Board, The Center for Strategic and International Studies (CSIS) and Climate Investment Fund (CIF, World Bank).



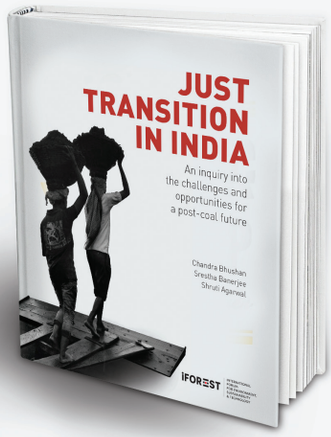
Consultations and Webinars

We organised multiple consultations and webinars to seek inputs and feedback on our research work as well as to share the findings with the larger audience. The panel discussions on the occasions of our webinars have brought together eminent experts from diverse sectors, industries and nationalities. A list of the major events organised in 2020-21 is provided below:

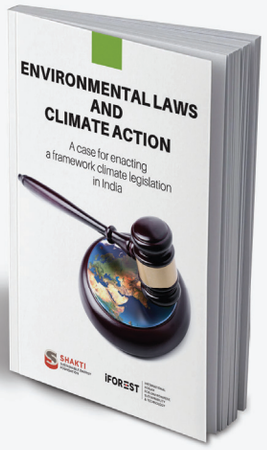
- Book Release & Webinar – Environmental Laws and Climate Action: A case for enacting a framework legislation in India
- National consultation on Just Transition in India
- International consultation on Just Transition in India
- Book launch and webinar on Just Transition in India
- Book Release & International Webinar on Just Transition in India
- Webinar on using District Mineral Foundation funds to support a Just Transition in coal districts
- Webinar on Safety Standards for Natural Refrigerants in India



Publications



Just Transition in India: An inquiry into the challenges and opportunities for a post-coal future
Chandra Bhushan, Srestha Banerjee and Shruti Agarwal/Book



Environmental Laws and Climate Action: A case for enacting a framework climate legislation in India
Chandra Bhushan and Tarun Gopalakrishnan/ Report

Blogs and Op-eds

Clean Up Indian Railways: It must match its climate credentials with sound pollution and waste management
Chandra Bhushan/The Times of India

India's Arctic Policy must push Western countries to give up double standards
Chandra Bhushan/The Times of India

A step up in climate action, India adopts safety standards for natural refrigerants
Apurupa Gorthi/Blog

Paris Agreement isn't enough: Climate crisis is too important to be left to governments alone. Private sector too must pitch in
Chandra Bhushan/The Times of India

Energy Transition and Just Transition in India must go hand in hand - as coal mines become rapidly unprofitable
Chandra Bhushan/The Times of India

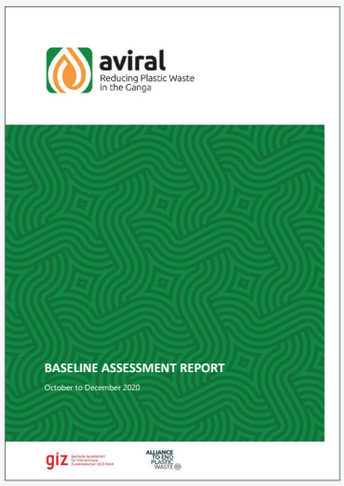
Jharkhand contributes to more than 32% of the country's reserves but loses more than it gains from coal
Srestha Banerjee/Interview

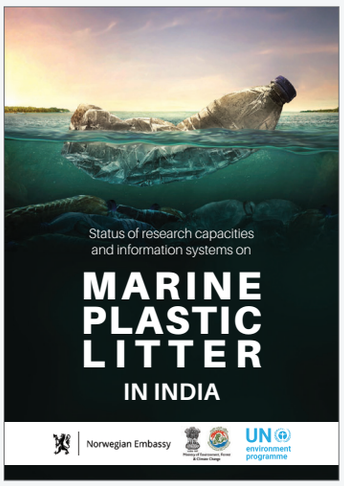
How to control air pollution from stubble burning: Combine harvester is the problem as well as the solution for stubble burning
Chandra Bhushan/The Times of India

Our Clean Air Plan is a shot in the dark
Chandra Bhushan/Outlook

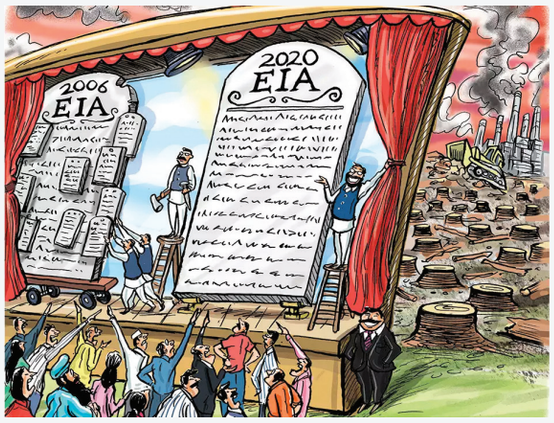
By focusing on cities and vehicles, we have been barking up the wrong tree on air pollution
Chandra Bhushan/The Times of India

DMFs need planning and administration reform
Srestha Banerjee/Blog





Breaking the Lockdown Chakravyuh



Environmental Hot Potato

Rebuilding a sustainable economy post COVID requires a long-term strategy, not just short-term stimulus
Chandra Bhushan/The Times of India

Environmental hot potato: Current EIA process is defunct. Parliament must legislate a new law based on sound science
Chandra Bhushan/The Times of India

Over regulation will not solve plastic waste problems, we need to transform the market and municipal services
Chandra Bhushan/The Times of India

India is too poor to afford coal as a primary source of energy in the near future...and that is aside from environmental costs
Chandra Bhushan/The Times of India

Zoonotic diseases are rife this century: Globalised world requires global code of conduct to overcome this threat.
Chandra Bhushan/The Times of India

Breaking the lockdown chakravyuh: Set realistic health goals and use latest scientific data to reopen the country, save lives and the economy
Chandra Bhushan/The Times of India

GOVERNING COUNCIL

Raghunath Anant Mashelkar

National Research Professor
Former Director-General, Council of Scientific and Industrial Research
Former President, Global Research Alliance

Pradeep Dutt

Leadership & Executive Coach

Anjali

Senior Lawyer
Dua Associates

Chandra Bhushan

CEO
International Forum for Environment, Sustainability and Technology

Anil Kumar Roy

Associate Professor, Faculty of Planning
CEPT University

CORE TEAM

Chandra Bhushan

Over the past two-and-a-half decades, Chandra Bhushan has been engaging on a wide range of environmental issues through research and writing, and has remained at the forefront of several public policy campaigns. An engineer and environmental planner by training, Bhushan integrates scientific and technical expertise with understanding of socio-economic realities to solve multi-dimensional environmental and developmental challenges. He is the founder-CEO of iFOREST.

Srestha Banerjee

Srestha is currently leading just transition and natural resource management work at iFOREST. She has over 11 years of experience working with Indian and US-based environment and public policy think tanks on issues of environmental governance, environmental justice, minerals and forest resource management, District Mineral Foundation (DMF) and sustainable industrialisation.

Sujit Kumar Singh

Sujit has over 17 years of experience in environmental management and capacity building. A primary focus of his work is improving the environmental and social performance of industrial sectors and encouraging sustainable business decisions and benchmarking performance of industrial sectors. He has also actively engaged in building the capacity of various constituencies.

Rahul Kumar

Rahul has over 10 years of experience in industrial pollution monitoring and reporting (air and water), waste management and resource efficiency, industry benchmarking and environmental impact assessment. He has worked on projects in India, as well as in Sri Lanka, Bhutan, Tanzania and Namibia and also authored/co-authored several research reports and technical guidelines.

Shruti Agarwal

Shruti has more than 10 years of work experience working as a community mobiliser, a policy researcher and writer and a business developer. Her core areas of expertise and interest are natural resource management, forest governance, climate change and community livelihoods.

Apurupa Gorthi

Apurupa works across the 'Pollution & Waste Management' and 'Energy & Climate Change' initiatives at iFOREST. She has worked on policy and programme design for the implementation of Montreal Protocol (Kigali Amendment) in India, and also on the evolution of food and water security in academic literature.

Sudha Venkataraman

Sudha has 20-plus years of experience in the field of accounting, administration, event management, and human resource development. She offers multiple support to the organisation.

Chinmayi Shalya

Chinmayi works on cross-cutting research and advocacy related to just transition and District Mineral Foundation (DMF). Staring off as a journalist, and then moving on to research and advocacy on environmental issues, she brings in a decade of experience of communicating environmental issues to varied stakeholder groups for effective public engagement and policy action.

Raj Kumar Singh

Raj Kumar is a graphic designer who takes care design requirements. He has been instrumental in conceptualizing and executing the design of our publications and communication materials in the last year.

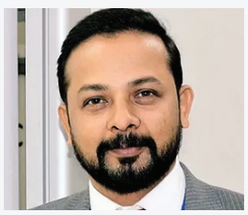
AFFILIATES AND ADVISORS

Tarun Gopalakrishnan

Tarun is a climate policy expert and is currently pursuing his PhD at the Fletcher School of Law and Diplomacy at Tufts University. He, together with Chandra Bhushan, co-authored the report on framework climate legislation.

Debasish Nayak

Debasish researches on waste management and works towards building awareness on it. He worked closely with us last year on the plastic waste inventory project, including travelling extensively to Haridwar and Rishikesh for the ground survey.



Sanjeev Kumar Kanchan

Sanjeev is an expert on industrial pollution and benchmarking, resource efficiency and online pollution monitoring (CEMS and CEQMS). He has advised us in the development of our training modules and also served as an expert speaker in our training programmes on these topics.

Dipankar Shah

Dr. Shah is a former Member Secretary of the Central Ground Water Authority. He spearheaded the National Aquifer Mapping and Management Programme and coordinated the groundwater resource assessment of the entire country.

Ranjan Sahay

Ranjan Sahay has served as Controller General, Indian Bureau of Mines, and played an important role in the formulation of policy for conservation of minerals, framing of MMDR Bill 2011, amendment of MMDR Act 2015 and in the framing of the Sustainable Development Framework (SDF).

R.K.Tyagi

R.K.Tyagi is an Environment, Health, Safety and Sustainability (EHS&S) expert with wide-ranging experience in executing projects in the Middle East, Europe and South Africa. He was EHS&S Head of Regal Beloit Corporation and is one of our key experts for our training programmes on the topic.

iFOREST

INTERNATIONAL
FORUM
FOR ENVIRONMENT,
SUSTAINABILITY
& TECHNOLOGY

CONTACT DETAILS

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