



**CENTRE FOR SCIENCE
AND ENVIRONMENT**

2021-22

ANNUAL REPORT

Knowledge-Based Activism



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Director's report

These last two years have been traumatic; not just for the organisation but also for the world around us. In March 2020, we had to shut down our 'normal' work and to start work from home. Over this period, there have been frequent lockdowns and we had continued work from home sporadically interspersed with work from office—on a rotational basis for teams.

While we have continued to keep high levels of productivity by moving work towards outputs of research and outreach, it has been challenging to stay focussed on the outcomes—the change that we seek to drive. This is partly because governments have been extraordinarily busy with the exigencies of responding to COVID-19 and the health crisis. It is difficult to engage on issues that are less urgent and demanding. Then travel has been restricted, which also means that work on the ground—in different countries and states—has been done virtually, which is not as productive as needed.

But now there is a growing sense that the COVID-19 pandemic may just be behind us. This even though the caseloads are rising again and there is huge inequity in the global vaccination programmes. Still, travel is coming back to near normal and we are back to full time work. It is clear that the urgency of our work is massive—not just COVID-19 but climate change threatens the very existence of our planet.

It is also clear that in the two-year hiatus, much has happened and much more has not happened. On the one hand, there is much greater awareness about the need to do things differently—the crisis of air pollution, the linkages with human health, the opportunity to rework livelihoods of rural communities based on natural wealth and the need to conserve water and treat wastewater.

On the other hand, change is not happening at the scale that is needed and, what is worse, climate change impacts are now real and are taking away the development dividend as poor in our world are worst hit—already at the margins of survival they find that they are unable to cope with the devastation of frequent extreme weather events.

Climate change: Leveraging action through a co-benefit agenda

Our work on climate change has been amplified. It is clear that climate change mitigation action cannot alone be the key driver for change. There are huge co-benefits in the way we manage our environment that is good for local environment and also help mitigate emissions globally. This is the strategy we have adopted so that there is buy-in for change at the national level, and use this to leverage the opportunity to address the urgency of climate actions as well.



(Sunita Narain)

Mapping CSE’s work on climate change

MITIGATION (SECTOR & GHG EMISSIONS)	OPPORTUNITY/INTERVENTION	OUR WORK 2022–23
<p>Power sector: Thermal power (40% of GHG emissions globally/ India)</p>	<p>Biggest contributor to greenhouse gas emissions and coal also adds to the domestic health burden because of air pollution. There are huge co-benefits in reducing emissions from coal for local air quality.</p> <p>Coal use in industrial boilers, because of unreliable electricity, is the cause of air pollution in our cities. India has committed to reduce dependence on coal powered energy by 2030.</p>	<p>Industry team</p> <p>To advocate for implementation of coal standards in thermal power plants (TPPs); work on low carbon pathways, e.g. phase out of older plants that are resource inefficient; fuel switch options for industrial areas and implementation of small boilers in small- and medium-scale industries.</p>
<p>Power sector: Renewable Energy</p>	<p>Need is to transform energy systems but also to ensure that energy is affordable and accessible to the very poor. Opportunity is to leapfrog from use of dirty biomass energy to cleanest energy in the homes of the poor. This will require financial mechanisms as well.</p> <p>50% RE target by 2030 requires India to increase installed RE to 700 GW by 2030. Current target is 450 GW by 2030.</p>	<p>Renewable energy team</p> <p>Keep track of RE performance in India/Africa and focus on the barriers that delay implementation</p> <p>Work on RE for energy access by focusing on the work on decentralized sources of clean energy/mini-grids, including rooftop solar, and see how these can be scaled up; financial mechanisms for support, including for offshore wind, repowering, rooftop solar aggregation, clean cooking options and energy for livelihoods.</p>
<p>Industry (18–20%)</p>	<p>Key sectors; iron and steel (5%), cement (6%), aluminum (1%), fertilizer, lime production (1%) and non-specific industries (6%) ; India has committed to: 1 GT reduction in CO2 by 2030 and reduction in carbon intensity by 40% by 2030.</p>	<p>Industry team</p> <p>In-depth research on low carbon pathways for the hard to de-carbonize sectors (iron & steel, cement, aluminum), in terms of resource efficiency, pollution abatement and circular economy.</p>
<p>Road transport (9%)</p>	<p>Long-distance freight transport by roads. Passenger vehicles in cities consume huge amounts of fuel and add to local pollution. The opportunity is to reinvent mobility systems for efficiency and affordability.</p>	<p>Air pollution and mobility team</p> <p>Focus on low-carbon growth opportunities for upscaling mobility transformation in cities. Focus is on e-vehicle mandate in India and Africa, and promoting e-vehicles for public transport in cities.</p> <p>We need to move people and not vehicles. We need the right to walk and cycle; to take a bus or metro. Right to mobility is the right to economic growth; access to mobility is key to inclusive and equitable growth.</p>

MITIGATION (SECTOR & GHG EMISSIONS)	OPPORTUNITY/INTERVENTION	OUR WORK 2022–23
Residential sector (4%) and commercial and institutional (2%)	Energy use in residential sector increases with temperature increase or decrease. Buildings are both source of greenhouse gas emissions and also with intensity of heat there is increased use of energy.	Sustainable habitats team Thermal comfort is needed in building design to reduce use of energy. Need to work on traditional architecture; passive building design for affordable, mass housing in India and the Global South.
Waste management	Landfills add to CO2 and methane production. Plastic manufacture is a huge user of fossil fuel. There is huge co-benefit of cleaning up our cities.	Solid waste team We cannot 'waste land for waste'. Segregation will allow processing of waste for resource recovery across cities in the Global South. We will push to implement ban on single-use plastic; add to list so that non-recyclables are not manufactured. Focus also on methane emissions and landfill remediation.
Agriculture (15%)	Enteric fermentation (8% methane), rice cultivation (3% methane), manure and soils (4% nitrous oxide)	Food systems team These are survival emissions and involve livelihoods of very poor communities. Focus will be on food systems, intensive food cultivation, and links with biodiversity and climate resilience. Focus also on crop insurance schemes as enhanced coping mechanism for the poor. Also focus on regenerative agriculture, which is good for nature, nutrition and livelihoods.
Forestry (nature-based solutions)	Forestry and nature-based solutions should be used for livelihoods of very poor and regeneration of lands. Forests are both sources and sinks and the effort should be to reduce deforestation (source) and increase re-forestation (sinks).	Climate change team Forest lands are habitats of poor communities and so while we must work on nature-based solutions, these must not be used to dispossess them further or destroy biodiversity. Research on science, policy and politics of sinks in India and the Global South.
Water and wastewater management	Water insecurity will grow with climate change impacts; heat and variable rain events will lead to increased drought and floods. Water management will be key to communities to cope with adverse impacts of climate change.	Rural and urban water and wastewater team CSE has worked extensively on community-based rainwater harvesting, groundwater recharge and faecal sludge; research and capacity building on climate change and water security, including water sensitive design in cities in India, Africa and South Asia; and source sustainability in rural areas and management of sewage for reuse and recycling.
Climate change: Global negotiations to push for equity and ambition	It is clear we have a short time-frame for action. We need the global community to cooperate for an effective and ambitious agreement.	Down To Earth/Education and climate team Continue to track extreme weather events and impacts on people and environment in the Global South. Build capacities of teachers, students and others on the urgency of action on climate. Push for need for an equitable and just transition. Focus on NDCs and equitable sharing of carbon budget and on loss and damage by highlighting needs of communities worst impacted by climate change.

Programme monitoring: Snapshot

Although 2021–22 began with the resurgence of the pandemic, CSE was able to achieve significant milestones in the year. The year's highlights included virtual book launches, such as the 'The Pandemic Journal', as well as the International Conclave on Antimicrobial Resistance, which witnessed the participation of experts from around the world. The 'Young Environmentalist' website was launched for young adults and children, and CSE's flagship event 'Anil Agarwal Dialogue' was also conducted on the AAETI campus.

In 2021–22, CSE research and programme teams conducted a total of 130 capacity building workshops in addition to 80 meetings and events (online and in-person) and engaged with 24,573 persons, of which 9,328 (37.9%) were female participants.

Advocacy and research productivity

A total of 95 publications were published in the year, which were downloaded 38,281 times. Programmes produced a wide variety of publications, including research reports; manuals and handbooks; factsheets; policy briefs and documents. DTE produced a total of 4 publications in the year, including the 'State of India's Environment 2022'; the 'State of India's Environment in Figures 2021'; an e-book on COVID-19, and another e-book, 'What is India Debating?' A wide range of collateral were also produced to support active campaigns—for e.g. the water & sanitation campaigns in cities and environment education outreach in schools, among others.

Meetings, seminars, webinars

CSE teams conducted a total of 80 meetings, seminars and online webinars in 2021–22, engaging with 14,162 persons, of which 5,365 (37.8%) were women participants. Given the work from home situation in most workplaces in addition to government mandated lockdowns, online engagements predominated—52 of the 80 meetings (65%) were online, reaching 11,652 pax.; of these, 4,494 (38.5%) were female participants. By way of a comparison, only 2,510 persons attended onsite and in-person meetings, some of them conducted at CSE's AAETI training facility in Rajasthan. Of these, 871 (34.7%) were female participants.

Many additional persons were reached online

It has become routine to re-stream CSE events, a strategy that enables a wider outreach. In 2021–22, an additional 54,509 people viewed CSE events using platforms such as Facebook, YouTube, LinkedIn, etc.

News media visibility

There was a significant uptick of CSE's presence in news media, both print, online and electronic (TV) in 2021–22. A total of 2,117 articles and programme segments directly mentioned CSE research, or used CSE staff as sources for news and feature articles—up from 1,136 the year before. This included national (1,567) as well as regional, incl. vernacular language news media coverage (355), and in news media outside India (195 mentions) (see *Annexure: Media visibility*).

Online dissemination

CSE websites continued to play a vital role in disseminating CSE research and views and engaging with a broader audience to help shape public discourse around programme themes. CSE websites recorded a total of 1,515,879 site visits in 2021–22 (up 13% from last year); annual ‘users’ stood at 1,276,891 (up 10% from last year), while pageviews clocked at 3,677,137 (up by nearly 25% from last year). Approximately 16.5% of the users recorded on all CSE websites were from outside India (including from Africa).

There was a marked increase in Down To Earth’s outreach in 2021–22. A total of 5,359 stories were published in 2021–22 in DTE Print, Web and Hindi editions (up from 4,363 last year). DTE online clocked 21,810,000 ‘visits’ (up 40% from last year). The site attracted 16,449,042 users (up 42% from last year); and 37,789,365 pageviews (up 32% from the last year). There was marked increase in DTE Africa segment—510,720 visits (up 137% from 2020–21); 934,971 page views (up 120% from last year). Importantly, DTE’s Africa section attracted 356,470 new users (a 125% improvement from last year’s tally).

Multimedia 2021–22

WHAT WE DID

285 Videos for DTE

20 Livestreamed webinars for DTE

270 Training videos for CSE

40 Livestream events for CSE

CUSTOM FORMATS

● 241 short explainers/video cards (1–4 minutes duration ea.)

● 15 long explainers/animations (over 8 minutes duration)

● 9-part documentary series on sustainable waste management

● 12 Features on good news (duration 6–12 minutes)

● 9-part video explainer series in Hindi

● 5 Young Environmentalist master class webinars for school children

● 13 training video modules for African participants

FIGURES COMPARED TO 2020–21

■ 2021–22 ■ 2020–21

Total views

14.6 million
9.6 million



Subscribers added

144,800
116,000



Total Subscribers

409,000

TOPICS COVERED

10 videos
Climate change (negotiations)

100 Videos
Climate change impacts/Extreme weather events

70 videos
COVID-19

13 videos
Solid waste management

20 videos
Good food and food security

10 videos
Africa



Learning,
demonstration and
training centre



AAETI

Anil Agarwal Environment Training Institute

AAETI is a learning, training and innovation centre designed to find appropriate and affordable solutions to some of the most pressing problems faced by the Global South, from climate change, air pollution and urban mobility to water and waste management, sustainable industrialisation, urban growth and environmental degradation.

State-of-the-art training programmes bring together expertise, knowledge, cutting-edge research and innovative learning tools from across India to build capacities for a range of audiences—regulators, lawmakers, communicators, professionals, students, civil society members and administrators.

Green campus

AAETI's 'green' campus is on a 11-acre wooded area in the foothills of the Aravalli in Nimli, Alwar (Rajasthan), about a two-hour drive from Delhi. It has residential and recreational facilities capable of hosting 150 people, including participants and staff.

A zero-waste, water and energy positive facility, AAETI is designed to demonstrate that it is possible to build one of the country's 'greenest' campuses without extravagant spending. Five key areas have been identified to meet green campus goals—site planning, material selection and construction, energy use, water management and waste management. CSE worked in close collaboration with sector specialists and consultants to establish campus performance parameters and targets that have been actively monitored during construction.

Model projects on the site allow training participants and visitors to explore technologies on water harvesting, wastewater treatment, solid waste management, organic agriculture and renewable energy, among others.

AAETI also houses India's first wastewater and faecal sludge management Lab. The Lab provides technology testing and referral services to a wide network of labs in India and other developing countries, to catalyse the transition to safe sanitation technologies and practices.



In 2021–22, CSE conducted **130 trainings** for 10,410 persons (38% of whom were female). This is a significant jump from the previous year, where 119 training events were conducted for 8,366 persons. Due to the pandemic induced travel restrictions, **95 trainings** (73% were conducted online, reaching 9,271 persons).



Capacity building hub

CSE research and advocacy programmes have mainstreamed training as part of their effort to engage and build capacities of key change agents in their sector. Despite the pandemic-related travel restrictions and the frequent ‘lockdowns’, AAETI hosted over 1,140 participants in the last year alone, attending 35 training and capacity building events.

Trainings and workshops range from technical and advanced trainings on greywater management and fecal sludge management for scientists and pollution regulators, to orientations for municipal officials on solid waste, construction & demolition waste management and resource recovery. AAETI hosts trainings for city and transport planners on preparing micro action plans as part of national clean air planning process, and engages with the small- and medium-scale sector on emissions reduction pathways. AAETI hosts CSE’s annual Anil Agarwal Dialogue, which convenes key environment stakeholders and decision makers to discuss key sectoral developments and to build consensus on policy and action.

Trainings and meetings at AAETI (2017–2022)

Year	Trainings	No. of participants	Meetings	No. of participants	Total participants
2017–18	5	86	0	0	86
2018–19	75	1,629	8	266	1,895
2019–20	47	1,154	3	339	1,493
2020–21	13	314	1 (PMR)	32	346
2021–22		639	2	92	731
	140	3,822	14	729	4,551



Capacitate and support public institutions such as regulatory agencies in the frontline of enforcing environmental rules, monitoring, enforcement and compliance. Work closely with urban planners, municipal engineers and urban local bodies to help them tackle the effects of a rapid scale-up of urban infrastructure—water, solid waste, river pollution, sanitation and housing.

Strengthen the abilities of environment managers by working with public and private sector enterprises and industry bodies to influence them on making correct choices and pushing sustainable practices.

Build powerful multipliers in society by working with influential change agents in society such as NGOs and CBOs to build local know-how and to explore viable, cost-effective solutions to help communities tackle pressing challenges.

Create a future-ready cadre of change agents by engaging with students, teachers and the youth to promote holistic understanding of sustainable practices and wise environmental decision-making and prepare them to intervene effectively in the decision-making process.

Build effective communication agents to present reason and analysis to influence the public agenda on sustainability, and to integrate the vital concerns that affect the lives and livelihoods of millions into the national debate.

Human resource management report (2021–22)

Work in the time of the pandemic

In 2021–22, India was badly hit by the second and third COVID waves. Almost 75% of CSE employees had tested positive and many lost family members and friends to COVID. CSE worked in hybrid mode with a rotation roster—two-day-attendance in office and work from home on the other workdays in the week. Significant measures were instituted for staff safety: Sanitisers near all strategic places across all floors; mandated wearing of face masks in office; appropriate seating arrangements to ensure social distancing; regular sanitisation of desks, equipment and toilets at frequent intervals in addition to enhanced fumigation of premises.

Staff welfare

Medical facilities: Medical coverage included providing staff with Health Insurance cover of INR 5 lakh (covered fully by CSE), and Life Insurance cover of INR 10–50 lakh (50% of the premium is shared by staff). CSE Administration helped staff members who tested positive by arranging home care or hospitalisation, and provided guidance on getting tested, etc. CSE also made the in-house canteen operational on working days, which provides subsidised, freshly prepared lunch and refreshments to staff members.

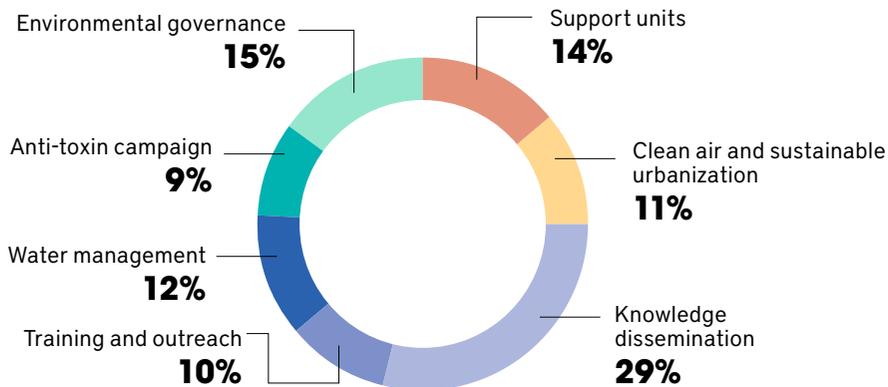
Planning and monitoring: As a response to the uncertainties brought forth by the pandemic, the annual plan was broken down into a quarterly format with intermittent outcomes and the work plans were made available to each staff on their respective terminals for easy access and effective reporting through the ERP system. This helped the management to stay connected and track the progress on a monthly basis. The quick weekly updates on the progress made by the teams helped them in staying intact and fostered motivation while working offsite.

Interns and volunteers

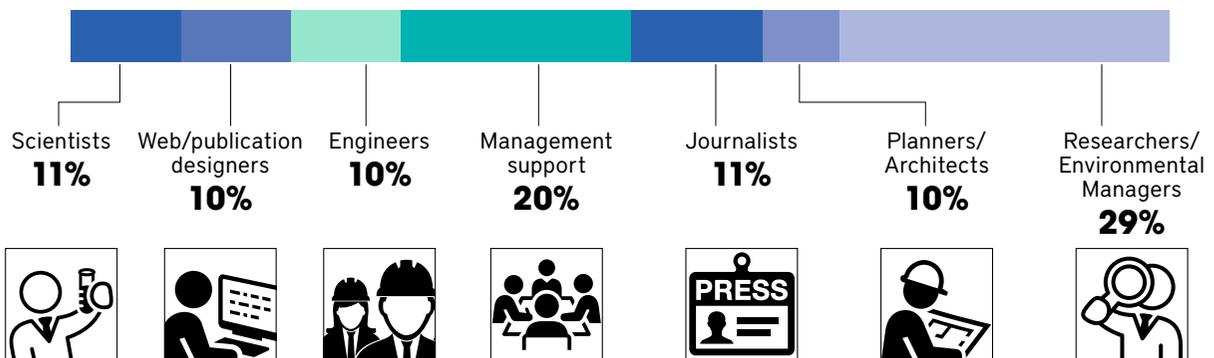
CSE offered a total of 53 internships and volunteer positions in the year to Indian and international students and young professionals. Key international universities included University of Leeds (UK), University of Bath (UK), University of Padova (Italy), and Hohai University (China). Interns from India were from universities including School of Planning and Architecture, Indian Institute of Technology, National Institute of Technology and National Law Universities, among others. Interns have been part of almost all programmes in CSE providing data inputs, organising events and seminars, and researching and writing for our fortnightly magazine 'Down to Earth'. Of particular note in the year has been the contribution made by school students and teenagers who actively contributed to the Young Environmentalist website.

CSE staff: A profile

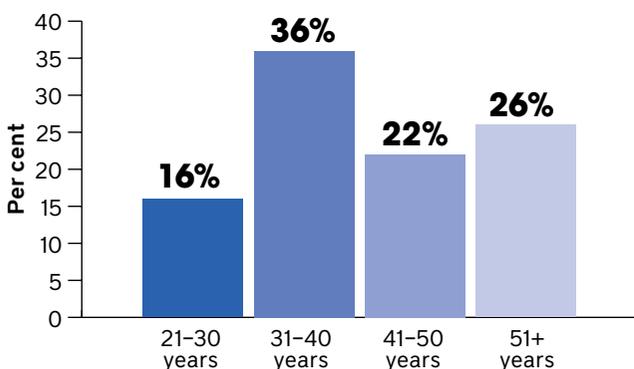
Staff distribution by programme



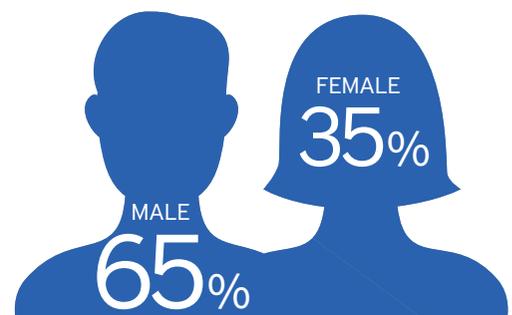
CSE talent pool



CSE is a young organisation



Gender ratio (2021-22)



Programme monitoring: Snapshot



Publications

CSE produced a total of **95 publications in 2021–22**, including research, policy and technical manuals. These were downloaded a total of **38,281 times in 2021–22**

Capacity building programmes

95 out of a total of 130 training events (73%) conducted in 2021–22 were online

A total of 10,410 pax. attended CSE's capacity building workshops in 2021–22. Of these, 3,963 (38%) were female participants

A total of 9,271 pax. attended CSE's online trainings (of which 3,732 or 40.2% were females)

A total of 1,139 pax. attended

35 onsite trainings (most of them at AAETI, CSE's facility in Nimli, Rajasthan), with the participation of 231 or 20.3% females)



Meetings



65% of all meetings conducted (80 nos.) by CSE in 2021–22 were online

A total of 14,162 pax. attended CSE's meetings in 2021–22, of which 5,365 (37.8%) were female participants

A total of 11,652 pax. attended CSE's online meetings in 2021–22. Of these, 4,494 (38.5%) were female participants

A total of 2,510 pax. attended CSE's onsite meetings in 2021–22 (conducted at AAETI, CSE's training facility in Nimli, Rajasthan). Of these 871 (34.7%), were female participants

Clean Air and Sustainable Mobility programme

TO ENABLE OUR CITIES TO SECURE THE RIGHT TO CLEAN AIR AND PUBLIC HEALTH

IN INDIA, measures are designed to strengthen NCAP implementation, including compliance mechanisms (monitoring, reporting and verification). This includes assessments of legal and technical aspects of reforms to strengthen National Clean Air Programme, NCAP, such as improving air quality monitoring and reporting mechanism (CSE is a member of the Central Pollution Control Board's expert committee)—specifically measures to harmonise air quality index to help different regulatory agencies to report the AQI uniformly. CSE is now working on a framework for regional air quality planning and implementation of NCAP.

State level

CSE works closely with the governments of Rajasthan, Maharashtra, Delhi-NCR, West Bengal, Odisha and Andhra Pradesh to develop and take on board comprehensive and regional multi sector clean air action plans that are in sync with NCAP targets (20–30% reduction by 2024). CSE's state-level interventions are regional and multi-sectoral, as city-level action plans are often inadequate to tackle regional-level pollution from cluster of cities. This involves identifying 'hotspots' and micro planning in non-attainment cities (cities that consistently exceed the safe levels of air pollutants as per National Ambient Air Quality Standards). Specific strategies, guidelines and policy recommendations were developed for emissions



abatement from sectors like transport, construction & demolition, industries and power plants for Mumbai Metropolitan Region and for the Jaipur region. Capacity building, engagement with schools and media outreach helped build the case for stringent action in cities.

In Rajasthan, the programme helped enhance strategies for multi-sector action in Jaipur region. A [multi stakeholder meeting](#) convened urban local bodies, departments of transport, environment, public works, industry associations, traffic police and researchers and a clear commitment was secured to with the state pollution regulator to carry out the assessment of the local pollution hotspots in Jaipur and frame sector-specific hyper local action plans for implementation in the non-attainment cities of Rajasthan. CSE's study on 10 hotspots in Rajasthan, including Jaipur, plus the non attainment cities of Jodhpur, Udaipur, Alwar and Kota, reviewed pollution from industrial, waste management, fugitive dust, area-sources among others and also remedial measures which are part of hyper local/micro action plans. The state pollution regulator has requested support for an additional assessment on fuel-based hotspots (coal dependent industrial regions).

As part of its knowledge and capacity building support to the implementation of clean air action plans in the state, CSE has entered into structured collaborations with key agencies, including with Institute of Town Planners India (Rajasthan Regional Chapter), with Malaviya National Institute of Technology, Jaipur, and with the Jaipur Municipal Corporation (JMC) to develop strategy for implementation related to management of all waste streams, street design and NMT, parking area management, mobility, and dust management. A joint workshop, [Blue Skies for Rajasthan](#), was conducted with the RSPCB.

As part of its citizen engagement initiative, the programme anchors activities in schools on air pollution causes, impacts and mitigation strategies, including quiz shows, teaching collaterals such as e-toolkits on air pollution, conducting online workshops on air pollution (65 schools from Rajasthan attended), together with a national teacher's conclave for approx. 100 teachers from across the country, in order to build awareness and citizen support for clean air actions.

In Maharashtra, a detailed analysis of air quality data of Mumbai and the surrounding region (Mumbai Metropolitan Region, MMR) showed that despite lower PM_{2.5} levels due to the prolonged lockdowns, air pollution in the region has gone up with the onset of winter and the unlocking of the economy; this despite the ventilation advantages of a coastal region.

CSE's recommendations for a comprehensive transport sector emissions control strategy for the MMR region have been submitted to the Transport committee of the Maharashtra State Pollution Control Board. CSE is also working with the Committee on measures to implement the vehicle scrappage policy. The Committee includes Mumbai Metropolitan Region Development Authority (MMRDA), Mumbai Traffic Police, Transport Department, pollution control board, CSIR-National Environmental Engineering Research institute (NEERI), Automotive Research Association of India (ARAI), Society of Indian Automobile Manufacturers (SIAM) and IIT-Bombay.

CSE built capacities of targeted officials from key departments involved in the implementation of clean air action plans—topics included urban air quality management and clean air action planning strategies on air pollution sources such as vehicles, industries, power plants, construction & demolition and solid wastes, among others. Trainings were also conducted for road transport officials in addition to other key reforms to strengthen on-road vehicle inspection programme.

In Andhra Pradesh, CSE in collaboration with the Andhra Pradesh Pollution Control Board had prepared action plans for 13 non-attainment cities, the more recent eight include Anantapur, Chittoor, Eluru, Kadapa, Ongole, Rajahmundry, Srikakulam and Vizianagaram. These plans have

CSE Urban Lab: Evidence building to strengthen advocacy

CSE's Urban Lab, hosted within the Clean Air and Sustainable Mobility programme, conducts research & analysis on air quality to build evidence, which is widely versioned and disseminated to build awareness on solutions. Increasing digitalisation have led to cities as well as governments have started to generate enormous volume of data on a daily basis. This big-data dump has the potential to inform and improve policymaking as well as monitoring implementation. CSE's Urban Lab has advanced technical and scientific expertise needed to skim through this big-data and derive new knowledge to further advocacy agenda. The objective is to inform and improve CSE research on issues related to the urban environment through deep-dive investigation leveraging big data. The Lab brings together data science and domain knowledge to build new knowledge to support a cleaner and sustainable planet. The current focus areas of the Lab are air quality monitoring, urban heat stress, and seasonal heat waves. In 202–22, the Urban Lab studies generated a total of **632 media clippings**.

URBAN LAB RESEARCH STUDIES—2021–22

- [Another toxic winter: Air pollution crisis in Delhi-NCR \(Press release\)](#)
- [Spread and scale of winter air pollution in India—2021–22 \(Press release\)](#)
- [Tracking overall and winter air pollution in the southern region—cities of Andhra Pradesh, Kerala, Karnataka, Tamil Nadu and Telangana \(Press release\)](#)
- [Tracking overall and winter air pollution in the western region—cities of Maharashtra and Gujarat \(Press release\)](#)
- [Tracking overall and winter air pollution in the eastern region—cities of West Bengal, Bihar and Odisha \(Press release\)](#)
- [Winter Air pollution in cities of Madhya Pradesh and Chhattisgarh \(Press release\)](#)
- [Winter Air pollution in the states of North East \(Press release\)](#)
- [Air pollution in North India: Moving beyond Delhi-NCR to unlock bigger pollution picture \(Press release\)](#)
- [First smog episode of the season: Decoding this year's Delhi smog \(Press release\)](#)
- [Winter is coming: Understanding pre-winter air pollution baseline in Delhi-NCR \(Press release\)](#)
- [Ground-level ozone in Delhi-NCR: Unmasking the hidden and growing health risk \(Press release\)](#)
- [Pandemic and air pollution in Delhi-NCR: Insights on World Environment Day \(Press release\)](#)
- [Air Quality Tracker Initiative Reports 2020–21](#)

been approved and are under implementation. CSE has also conducted knowledge and experience sharing workshops with key departments including department of industries, transport, local bodies and municipalities, among others, to support the action plan implementation.

In Delhi and NCR, as Member of the expert panel formed by the Commission for Air Quality Management (CAQM), CSE provided knowledge support and guidance for the action plan for clean air, spanning the areas of pollution from vehicles, industry units, waste management, and pollution from area sources such as dust, waste burning, small scale units, among others. CSE's inputs have contributed to the CAQM recommendation of replacing dirty fuels, including coal from industry units in the adjacent districts of Delhi-NCR. The programme contributed to the design of a hyper local clean air action plan for Gurugram. This was built upon CSE's earlier efforts as part of the Supreme Court-appointed EPCA committee, which had proposed a graded response action plan (GRAP) for Delhi-NCR and the implementation of the RFID (radio tagging for heavy vehicles entering Delhi to strengthen tracking the movements of such vehicles) at 13 major entry points of Delhi. The plan identified industrial hotspots where local area actions were

needed; pushed for cleaner fuels implementation; recommended additional CNG filling stations across NCR and pushed for increased PNG use in industrial areas.

In Odisha, CSE engages with the State Road Transport Corporation to help strengthen bus services, operations and management. CSE also provided knowledge support for state agencies to prepare clean air action plans and implementation strategy for non-attainment cities. The state pollution control board (OSPCB) has appointed CSE as member of a committee to oversee approval of agencies to conduct Source Apportionment and Emission Inventory studies in non-attainment cities. OSPCB has also sought CSE's knowledge support to prepare micro action plans for all the non-attainment cities and the state's clean air action plan. Field visits and consultations have centered on action plan formulation, identifying emission reduction strategies, timelines, budget prioritisation and framing of activities for different departments to help Odisha prepare state- and city-level action plans as part of the National Clean Air Programme (NCAP).

In West Bengal, CSE provides assistance to the state government's Department of Environment (MoU signed) and the Department of Transport to prepare clean air action plans in non-attainment cities and prepare source specific strategies. CSE also helps state agencies in compliance monitoring.

CSE supported the Department of Environment to strengthen time-bound compliance reporting based on 258 indicators spread across multiple sectors—air quality monitoring, pollution source assessment, public outreach on air quality, road dust, construction and demolition waste (C&D), solid waste management, vehicular pollution and industry. The programme assisted the Kolkata/Howrah municipal corporations, traffic police, transport department, environment department, the Kolkata Municipal Development Authority, and West Bengal's Transport Department to prepare comprehensive progress reports.

CSE also provided field-level inputs into C&D waste management in Kolkata and surrounding areas. CSE has also finalised the clean air action plans for six non-attainment cities in the state—Barrackpore, Asansol, Durgapur, Haldia, Raniganj and Howrah. These have now been approved for implementation, including a ban on polluting fuels as part of a clean fuels policy.

As part of its wide-range cooperation with the state, CSE contributed to micro action planning; to the State's clean air action plan; and more recently, to the state's climate action plan, given its alignment with the clean air action plan. CSE helped the Department of Environment to formulate the clean fuel policy in February 2020. CSE assessed PUC centres in the state, convened a workshop on BS-VI readiness and on remote sensing and helped formulate the framework for Parking policy for Kolkata Metropolitan area (KMA).

Global programme

In Ethiopia, CSE has been providing knowledge support to the Environment, Forest and Climate Change Commission (now EPA) on air quality monitoring and management. CSE prepared a report, '[Air Quality Management in Ethiopia: A Guidance Framework](#)' which was based on detailed analysis of the challenges in cities of Ethiopia, mainly Addis Ababa, the capital city, and created a comprehensive template for integrated action for air quality improvement. This was followed by the '[Addis Ababa Clean Air Action Plan](#)', based on which the EFCCC has prepared its draft on national air quality roadmap. This draft roadmap was reviewed and presented by CSE in a consultation held with the national team. CSE has worked further on the official draft and incorporated the necessary elements along with an action plan and strengthened the roadmap. This is now being finalised by the department to be presented to all the stakeholders in a joint meeting with CSE.

In Nigeria, CSE has collaborated with the Federal Ministry of Environment and provided

Remote sensing for in-use vehicle emissions monitoring

CSE is supporting the roll out of remote sensing for in-use vehicle emission monitoring as part of the vehicle inspection programme in non-attainment cities in Rajasthan, Odisha and West Bengal. The RS programme has been included as part of the clean air action plans for non-attainment cities.

In compliance with the Supreme Court directive of 2019 the ministry of road transport and highways (MoRTH) has released the technical rules for its implementation, and the ministry has prepared 'Remote Sensing Devices for on-road Emissions Monitoring – Product Specifications and Programme Guidelines', AIS-170 in October 2020. CSE has leveraged knowledge support from ICCT to strengthen guidance framework for state governments, and also commissioned a study to identify the local challenges, learning from technical studies and field level experiments and pilot studies.

CSE's programme conducted targeted training and sensitization programmes for state road transport officials on implementation and enforcement. As part of its knowledge support to policy action, CSE has reviewed global and Indian initiatives on remote sensing, assessed technology roadmap for available RS equipment, assessed the programme design needed to roll out remote sensing, and identified gaps in the current rules to strengthen legal back up for RS implementation.

The programme conducted national level sensitization and experience sharing workshops ([The Road to Cleaner Emissions](#)) for state governments; experts from ICCT, Hong Kong and China shared global learning experiences, while participants from Africa and the global South were exposed to the new technologies and regulation. CSE will work closely with West Bengal in the coming period to evaluate RSD-based vehicle inspection programme in Kolkata. State workshop in [Odisha on in-use vehicle emission control](#) was also conducted, in addition to a series of capacity building and orientation workshops on-road emissions inspection and compliance regime.

knowledge support on clean air action planning framework. The policy document, [Guidance on Air Quality Management and Clean Air Action Plan for Cities of Nigeria](#), was prepared for the Ministry. This comprehensive document is in 2 parts—Part 1 is Overview and Part 2 is comprehensive clean air action plan for Nigerian cities along with an action plan table with agencies responsible and timeline for implementation. This has led to setting up of task force involving different departments and ministries for more granular sectoral strategy development. In addition, the Federal Ministry of Transport has requested CSE to review the scope and provide guidance on developing the compressed natural gas programme for vehicles. This will be now taken up for consultation to chart a roadmap.

Pan-Africa network and compendium of Clean Air Action in Africa: CSE has initiated a pan-Africa network on clean air solutions that brings together key regulators from different countries of Africa to foster knowledge-sharing, cross-learning and South-South experience-sharing on emerging good practices in the Africa region. This has also been broadened to include experiences from South Asia to enrich the process. The focus of this network engagement last year was on air quality management strategies, and the ongoing initiatives and the ones undertaken in the post-pandemic times to bring in change as part of the new normal agenda. Already, many parts of Africa are on their way to adopting new policies and strategies for air quality management, emission standards roadmap, fuel quality improvement, restraining old vehicle import, improving public transport, walking and cycling, car-free zones and pedestrianisation. This experience-sharing interaction in October 2021 convened 125 participants, with speakers from UNEP, Ethiopia, Nigeria, Kenya and Sri Lanka. Officials from key regulatory agencies of 16 African countries were part of this.



E-Vehicles

SUPPORT ENABLING POLICY AND
IMPLEMENTATION MECHANISMS
TO MEET AMBITIOUS FLEET
ELECTRIFICATION TARGETS

THE PROGRAMME'S initiative on e-vehicles is designed to speed- and scale-up the e-mobility transition in India. It pursues a zero emission mandate, supported by stricter emissions and fuel efficiency regulations, together with a well-defined incentive structure (both fiscal and non-fiscal).

On the zero emissions mandate for automobile manufacturers to expedite the transition to e-vehicles, the Government of India reviewed its policy framework for larger adoption. CSE's conversation with NITI Aayog (government's own policy think tank) has revealed that they have begun the conversations with vehicle manufacturers (OEMs) about an Indian version of a ZEV mandate in annual sales targets. The initiative of the state governments to set targets for fleet electrification is supporting this strategy. Meanwhile, there is increasing demand from states that are demanding and mandating a certain percentage of fleets (high mileage vehicles such as delivery, taxis, autos) to convert to electric modes in coming years.

A key piece of research was the policy pathway analysis for achieving zero emission mandate. The report, [A Case for Electric](#), assessed the actions taken so far both in India and globally to promote the use of electric vehicles. CSE conducted a performance assessment of the FAME 2 scheme along with assessing its alignment with state level electric vehicle initiatives. CSE also conducted an assessment of the battery storage ecosystem to understand the cost economics of EV battery manufacturing, investment challenges, assessment of various battery technologies and supply chains. Research also covered EV charging infrastructure, a major enabler for EV adoption (India has allocated separate funds to develop charging infrastructure within cities and along major corridors).

A stakeholder meeting / webinar with government and industry stakeholders, ‘[Pathways for scale and speed in transformation in zero-emission vehicles: Opportunities and challenges](#)’ explored the emerging pathways and instruments of change to understand preparedness in India to make the big shift from the internal combustion engine to electric traction. The webinar attracted 525 persons, including participants from industry, government and academia from India and abroad (press release: <https://www.cseindia.org/india-s-policies-and-programmes-on-electric-vehicles-are-a-case-of-missed-opportunities-says-cse-10980>).

The programme conducted several specific pieces of research and convened roundtables on e-vehicles, including a review of effectiveness of the fuel efficiency standards to drive electric vehicle programme—[India’s Fuel Economy Benchmarks](#) (<https://www.cseindia.org/india-s-fuel-economy-benchmarks-10948>). Participants included Automotive Research Association of India, Bureau of Energy Efficiency, International Council on Clean Transportation, Maruti Suzuki India Limited and Petroleum Conservation Research Association.

CSE commissioned a study to comprehensively assess the entire electric vehicle market in India covering all vehicle segments. The study helped create a time-bound roadmap for electric vehicle penetration; recommended key supportive measures to catalyse the electric vehicle market; identified and proposed policy, financial, fiscal and capacity building measures to be adopted over this decade; and proposed a time-bound action plan and clear roadmap to push for ZEV mandate.

The research paper [Demystifying the Electric Car](#) assessed the impediments and opportunities for individual ownership of e-vehicles such as user awareness, availability of charging, cost and convenience. Another CSE study, [Electric Bus: Towards Zero Emission Commuting](#), assessed effectiveness of current incentive programmes in e-buses as they relate to state transport undertakings, including manufacturing, sales and e-bus operations to strengthen the FAME II incentive framework. Another [paper](#) outlines the major challenges to operate e-buses and how to proceed towards post-COVID expansion.

In support of its work in states, CSE’s [experience sharing workshop and field trips—‘Empowering E-Mobility in Indian Cities’](#)—helped address gaps in implementation of state EV policies. The workshop attracted 32 participants from eight states (Assam, Andhra Pradesh, Jammu & Kashmir, Karnataka, Maharashtra, Odisha, Uttar Pradesh and West Bengal), and also included city officials, state and bus transport departments, ride share aggregators, delivery service providers, battery recyclers, finance providers and a fintech organisation.

CSE has drafted strategies for the EV policy of West Bengal’s Transport Department. This includes targets for adoption of EVs, increasing the charging network and in manufacturing; financial incentives for rapid electrification for various class of vehicles; non-financial incentives such as parking, tolls and permits; support for charging infrastructure, manufacturing, skilling and jobs, and battery management and recycling ecosystem; along with a plan for policy implementation and financing, and consumer awareness and outreach.

In Odisha, CSE prepared actionable strategies for rapid electrification and their implementation in the state. The scope of this engagement is wide, and includes a holistic assessment of different vehicle segments, primarily focusing on public and intermediate public services like buses, autos, etc.; assessing available technologies including vehicles, batteries and charging infrastructures; identifying key challenges; review of the existing policies and procedures; city readiness for electrification; assessing the need for capacity enhancement; and lastly, preparing a detailed strategy for complete transformation. As part of the three-wheeler electrification strategy for Odisha, CSE conducted a roundtable discussion, ‘[Demystifying e-mobility in Odisha: Strategies for implementation](#)’.

Urban Water-Waste programme

BUILD INSTITUTIONAL AND TECHNICAL CAPACITIES, HANDHOLD IMPLEMENTATION OF DEMONSTRATION PROJECTS, AND LEVERAGE POLICY OPPORTUNITIES TO UPSCALE SUSTAINABLE WATER, SANITATION AND FAECAL SLUDGE MANAGEMENT

THE PROGRAMME'S work is aligned with the government's push for water pollution abatement, with focus on inclusive sanitation and faecal sludge management in cities that are located along the Ganga River basin, with particular focus on Uttar Pradesh, India's most populous state.

CSE has developed key partnerships at the national and state levels, and is well aligned with the government's priorities on the provisioning of safe sanitation across the sanitation value chain. CSE is also recognised as a key resource centre (KRC) of the Government of India's flagship programme, 'National Mission on Clean Ganga' (NMCG). In addition, the programme has an MoU with the Uttar Pradesh state government to work in the areas of inclusive sanitation, including FSSM.

FSSM in Uttar Pradesh

CSE's programme support unit in Lucknow works closely with the Directorate of Local Bodies to provide handholding support to fast track the sanitation and FSSM work in the state. A total of



62 faecal sludge and septage management (FSSM) projects have been sanctioned in Uttar Pradesh (40 FSTPs and 22 co-treatment facilities located in sewage treatment plants, STPs) are in advanced stages of implementation. CSE closely monitors 6 functioning FSTPs—in Chunar, Unnao, Jhansi (2), Modinagar, Loni and Aligarh. An [online dashboard](#) tracks the construction/implementation status of the FSM and co-treatment projects in the state. CSE's Pollution Monitoring Lab monitors the performance efficiency of STPs & FSTPs in the state, and trains local labs. Trainings and exposure visits (e.g. to Odisha last year) are organised to showcase best practices on FSSM.

City level interventions in Uttar Pradesh

In addition to state level efforts, the programme works intensively with the cities of Bijnor and Chunar in UP to help scale up interventions across the sanitation value chain. One FSTP in Chunar and one co-treatment facility at Bijnor were commissioned under the Government of India's flagship programme, Namami Gange, for which CSE provided technical assistance. These pilots in Chunar and Bijnor serve to provide ground level evidence to help scale up effective and sustainable treatment options for the state, which, as is the case with most urban centres in the Indo-Gangetic region, is overwhelmingly dependent on onsite sanitation. CSE's team also supported the critically important 'software' / enabling components, such as engaging regularly with the city sanitation cells, pushing for regular city sanitation task force meetings, running IEC campaigns, helping frame model tender documents and procedures for construction, desludging and dealing with O&Ms post-commissioning. Municipal byelaws have been formulated for city wide sanitation (FSSM bye-laws for Bijnor city were published in the Gazette in June 2022).

Capacity building hub on urban sanitation in India

CSE is today widely acknowledged as a national-level capacity building hub on sustainable water management, sanitation and faecal sludge management. In 2021–22, a total of 10 (3 online and 7 residential) trainings were conducted for 200+ participants, with focus on mainstreaming citywide water and sanitation management, water sensitive urban design and planning, and rainwater harvesting. Two webinars were conducted in this period, with participation of close to 1,000 participants drawn from India, South Asia, Africa and the rest of the world

Trainings ranged from technical workshops on GIS and Remote Sensing for designing and implementing green infrastructure, to an online course on Water Sensitive Urban Design and Planning (WSUDP), preparation of SFDs, and advanced training on decentralised wastewater treatment and faecal sludge management, among others. Similarly, teaching-learning materials were updated and deployed for training, including the MOUNT 2 (with 8 new case studies), and C-GINS (a web-based compendium of case studies on GI, showcasing good practices). Alumni were tracked—more than 300 attended an alumni impact workshop—and encouraged to implement 'action plans' they had devised during the trainings.

CSE's Pollution Monitoring Lab is today widely acknowledged for its contributions to the non-sewered sanitation sector. In 2021–22, the Lab evaluated the performance efficiency of 14 FSTPs and the co-treatment efficiency of 14 STPs, all with diverse technologies, located in Rajasthan, Uttar Pradesh, Odisha and Uttarakhand. This builds upon the previous years' assessment of 12 FSTPs. The Lab also monitored the septage processing capability of three model projects located in CSE's training campus (AAETI). The Lab also devised standard protocols for testing of dried sludge and faecal sludge co-compost/vermin-compost from 14 FSTPs and 14 sludge co-processing STPs for use in agriculture. The Lab also created standard operating procedures (SOPs) for the analysis and sampling protocols of dried sludge & co-compost.

The Lab's mandate is also to build capacities of other labs—private and government owned—in the water and sanitation sector. Three trainings were conducted for 64 professionals—on

CSE's partnership with NMCG

The objective of CSE's partnership with **National Mission on Clean Ganga (NMCG)**, a priority initiative of the Government of India, is to contribute to efforts to make cities in the Ganga basin water-sensitive and to improve river flow/health. The aim is to ensure convergence of the 'Namami Gange' Mission with other national and state missions on urban development, including AMRUT, Smart Cities, Swachh Bharat Mission, HRIDAY, and NULM, as well as convergence with missions related to water management, including Atal Bhujal Yojana, Jal Jeevan Mission, Jal Shakti Mission.

The cooperation spans conducting action research, guiding practitioners, capacity building of urban local bodies and elected city officials to address implementation challenges on decentralised water management, augmenting water supply through rainwater harvesting, sewage and septage management, in addition to reuse/recycle of wastewater. CSE conducted 4 webinars for 1,900 participants (40% female), representing 356 cities and towns in India and from 51 countries, with another 5,030 persons viewing proceedings online via livestream. Six trainings were conducted under this initiative, attended by 562 participants (~ 50% female) spanning 156+ cities.

A report, '[Roadmap for Implementation of Water-Sensitive Urban Design and Planning \(WSUDP\) in Uttar Pradesh: Storm water Harvesting in Parks and Open Spaces](#)' showcases the potential of run-off infiltration in storm water harvesting systems in parks and green open spaces in five cities—Lucknow, Kanpur, Varanasi, Prayagraj and Moradabad—in Uttar Pradesh. Online resources, including a [web page](#) and helpdesk, showcase background information on the programme, key thematic areas, relevant resources, outcomes, as well as news, upcoming events and publications.

FSSM, on analysis of drinking and wastewater for chemical and microbiological parameters, and an advanced training programme on FSM.

Outreach

The programme remained active and engaged with a community of peers, with a bi-monthly e-newsletter and regular postings on platforms such as Water digest, SuSanA, NFSSM Alliance, IWA etc. It is also active on social media channels including Twitter, Facebook, LinkedIn & WhatsApp groups. Nine blogs and several articles were published in Down To Earth in this period. CSE organised a series of events. Articles, pocket books and publications were put out as part of COVID-19 awareness campaigns with focus on frontline sanitation workers. Eight case studies were uploaded on [MOUNT 2](#), an aggregator platform for technologies and solutions for non-sewered areas. Street plays (nukkad natak) in Lucknow, and a Ganga Yatra (run), poetry competitions and signature campaigns in Bijnor and Chunar as part of the Ganga Utsav 2021 (festival of the Ganga).

Global programme

The programme's key engagement areas in the Global South—Africa, South Asia and in 2021–22, also the Caribbean—span the areas of City-Wide Sanitation (CWS); Faecal Sludge Management (FSM), including building capacities of sanitation planners on preparing and deploying 'shit flow diagrams' (SFDs); together with Water-Sensitive Urban Design and Planning (WSUDP). The programme conducted capacity building programmes, workshops and provided technical support on these themes. These were primarily conducted online due to the COVID-19 related travel restrictions.

In 2021–22, the programme conducted three online trainings, one training of trainers, one webinar, and three workshops on these themes, reaching out to 600+ practitioners from 20+ countries in the Global South. CSE has deep-dived in South Africa, Bangladesh and the Caribbean to work towards institutionalising SFD, CWS, FSSM and WSUDP.

CSE's SFD work in Africa, South Asia and Caribbean

CSE has conducted two online trainings, one training of trainers, one webinar and one workshop on SFD preparation, and how the SFD tool can be used for preparing city sanitation strategies and mainstreaming FSSM in the Global South. More than 170 practitioners from Africa, South Asia and the Caribbean attended these events. In addition, CSE published a total of 19 SFD reports from South Africa, Bangladesh and India on the SuSanA platform.

In South Africa, CSE worked closely with its country partner Water Research Commission (WRC) to provide capacity building (an [orientation workshop](#) and an online [International Training-of-Trainers](#)) together with technical support for institutionalising SFDs in South Africa under the country's 'Brown Drop Initiative'. Under this initiative, SFDs will be integral in establishing a baseline for FSM and sanitation strategies. Additionally, they will also be used as a monitoring tool to assess progress of these strategies. WRC has roped in national universities to upskill and execute capacity building and preparation of SFDs. CSE has capacitated 75 practitioners from South Africa on how to prepare SFDs, and how to conduct training programmes on preparation of SFDs. In addition to this, CSE provided technical support for publishing of 5 SFD reports from South Africa on the SuSanA platform.

In South Asia, CSE has been working on capacitating practitioners from Bangladesh, India, Nepal and Pakistan on preparation of SFDs, and providing technical support to the practitioners in publishing the reports on the SuSanA platform. This included an [online Masterclass](#) for more than 100 participants across South Asia on how to prepare SFDs, in which experts from around the world gave their presentations. The programme also conducted a two-part online [international training on preparation of SFDs](#) for 63 participants (govt. officials, researchers, academics, consultants and civil society practitioners working in WASH sector) from India, Bangladesh and Nepal to help practitioners map excreta flows using the SFD tool and using the data for citywide sanitation planning. A total of 10 alumni published the 'SFD Lite' report for their home towns upon completion of their training.

The programme, in a first, targeted the Caribbean region. An international (online) training, [Preparation of SFD for Caribbean countries](#) was conducted in collaboration with Global Water Partnership – Caribbean, to sensitise 26 practitioners representing 11 cities across 7 countries in the Caribbean on the SFD tool, and to develop SFD reports in this underdeveloped region.

Water sensitive urban design and planning (WSUDP)

In South Africa, CSE strengthened the [community of practice on WSUDP](#). CSE, in partnership with WRC and the Future Water Institute (University of Cape Town), conducted trainings for 95 practitioners from 10+ cities in mainstreaming and implementing WSUDP into city planning for urban water resilience. [Discussions](#) centered on how WSUDP is essential to build urban water resilience against climate change. An [international training](#) was conducted for 53 participants covering rain/stormwater harvesting, decentralised wastewater management and local reuse.

CSE's Pan-Asia / Pan-Africa work

The programme conducted two capacity building workshops ([Pan-Asia](#) and [Pan-Africa](#)) on 'Water and Sanitation Sensitive Planning for Building Climate Resilience in Cities', reaching out to 300+ practitioners from 20+ countries across South Asia and Africa. Leading sector experts were involved, including WaterAid, International Water Management Institute, Institute of Development Studies, Lanka Rain Water Harvesting Forum, World Resources Institute, WRC and UCT, among others.



Rural Water-Waste programme

ESTABLISH POLICY PRINCIPLES, INNOVATIVE TECHNOLOGIES AND IMPLEMENTATION STRATEGIES FOR SUSTAINABLE WATER AND SANITATION, INCLUDING FAECAL SLUDGE MANAGEMENT (FSM) TO HELP LAY THE FOUNDATIONS FOR A WATER- AND WASTE-PRUDENT SOCIETY

THE PROGRAMME has networked with different states to capacitate officials from government's engineering departments on the safe management of faecal sludge. CSE's research has shown that in the Swachh Bharat Mission (Gramin) Phase 2, there is interest in managing faecal sludge—either through retrofitting of single-pit toilets and faulty septic tanks or through ex situ treatment. A total of 384 government officials have participated in CSE trainings on faecal sludge management. The team has also used CSE-produced films to advocate on the issue of in situ management of faecal sludge.

CSE has been designated by Department of Drinking Water and Sanitation, Ministry of Jal Shakti as a key resource centre to capacitate government officials on the Government's flagship programme, Jal Jeevan Mission. This Mission seeks to secure drinking water taps in every household in rural India. As the government's partner (key resource centre), the programme trains water and sanitation engineers drawn from across the country on drinking water source

sustainability, rainwater harvesting, greywater management and safe faecal sludge management, among other topics.

In 2021–22, CSE conducted trainings on greywater management (3 online trainings) and sustainability of drinking water (2 online and 1 residential training programmes). Around 402 government officials from different states have been trained by the unit under Jal Jeevan Mission. These issues were also highlighted in three films and dozens of articles published in Down To Earth on safe sanitation and sustainable water management.

Global programme

The programme continues its partnerships in Tanzania (Ministry of Health, Community Development, Gender, Elderly and Children), Uganda (Ministry of Water and Environment), and Nigeria (Federal Ministry of Environment). In the past year, and given the travel restrictions, capacity building has taken centre stage. The programme put together a scoping paper on sanitation and groundwater recharge and conducted an online ‘level-one’ training on faecal sludge management and on groundwater. In addition, an online advanced (level-two) course on onsite and ex situ sanitation systems along with greywater management and groundwater recharge was also conducted for participants drawn from the key water and sanitation agencies in these countries.

In 2021–22 alone, 589 participants across the Global South attended CSE trainings on faecal sludge and greywater management; an additional 481 participants were capacitated through webinars/report release online events. A total of 333 government officials were trained on groundwater recharge, and an additional 41 participants capacitated through webinar/report releases.

Tanzania and Uganda have shown special interest to work closely with CSE on the issues of greywater and using the treated greywater as a potential source of water for non-potable sources. Uganda has also chosen two model sites at Kings College Budo and Kayunga district hospital in Wakiso and Kayunga districts respectively. Officials trained by CSE will be designing the wastewater systems here and CSE will be helping the Ministry of Water and Environment (the implementer) for developing the TOR for hiring consultants to be involved in the projects.

The programme produced two scoping papers for its Tanzania partner—Tanzania Policy strategies to augment Ground Water through Rainwater Harvesting (released online), and Tanzania state of sanitation (also released online). Capacity building remained key in the cooperation—a total of seven online trainings were conducted for Tanzanian officials on sanitation, and six trainings on groundwater recharge. In addition, the programme also conducted two Webinars on sanitation.

Renewable Energy programme

DE-CARBONISE THE ENERGY SECTOR FOR EMISSIONS REDUCTION AND CATALYSE ENERGY ACCESS FOR THE POOR

BUILDING ON previous work on decentralised clean energy options, CSE is looking into the role of mini-grids in electricity demand displacement, as well as their future as tail-end generators integrated in the grid. India has committed (in the recently held CoP26 in Glasgow) 50% non-fossil energy share and 500 gigawatt of renewable energy capacity by 2030—mini-grids could prove to be the pathway to fulfil that commitment. Despite the massive expansion of the grid, electricity supply remains uncertain and frugal in many parts of India. Mini-grids have emerged as vital support for providing energy for lighting and for small businesses, especially in rural parts of the country. A mini-grid can effectively manage household and commercial electricity demand by generating power at the point of consumption.

Mini-Grid & Clean Cooking (DRE) in India: Report and webinar

Decentralised distributed power could be the panacea for India's power woes. In a country where 200 million people still



lack access to electricity (as per the World Bank), it has the potential to assure 24x7 reliable and affordable power, and enable a smooth transition to electric cooking. CSE's publication, [Mini-Grids a Just and Clean Energy Transition \(Vol. 1: India scoping study\)](#) documents case studies of mini-grids from across the country, of various technologies and scales, implemented in differing geographies, and with varying business and government support models. This document served to convene leading stakeholders and practitioners from across the country for a Webinar, 'Clean Energy for Energy Access: Mini-Grids and Clean Cooking' (December 14–15, 2021).

The meeting explored the existing mini-grid systems already in operation across the country, the barriers to mainstreaming decentralised clean energy and clean cooking to strengthen energy security. Participants represented a wide range of stakeholders, including state nodal agencies, private project developers, think tanks and research institutions. Select international participants were also invited from Africa (Uganda, Ethiopia, Rwanda, Nigeria) and Asia (Nepal, Bangladesh, Indonesia). A key learning here is that there are already in place a plethora of technologies, including for grid interactivity and smart metering, various business models, O&M practices and financial support models to meet the challenge of reliable, affordable and scalable energy for all. What is needed is a concerted push for policy clarity across the country, as well the need to ramp up capacities in states and on the ground.

Watchdog role

In India, the programme's role is to be a think-tank and watchdog to keep track of the status of implementation of RE in the country, and do this through targeted analyses, articles, policy response pieces, commentary and stakeholder meetings. The canvas is large for the sector, comprising large energy systems to mini-grids and standalone devices; varying geographies; state policies and support systems; each factor carries particular implementation risks.

The sector is also crowded with private business interests. It is therefore crucial for independent organisations to keep a close eye on developments, especially as any big development here has consequences for the energy poor.

A roundtable on utility scale energy storage: Although supply side storage is lower in scale on an aggregated basis, it is of strategic importance as it will help to open up and 'democratize' power markets—requiring greater and faster response by regulators and policymakers to respond to falling prices of storage and renewables and increased prosumer participation. Discussions touched up the role of technology advancement, use of data, India's benefits as it strives to take up a leadership role in implementation and manufacturing, including R&D which has generally been missing.

Global programme

CSE had earlier engaged with the Ministry of Energy & Minerals, Government of Tanzania for building capacities in support of the growth of RE and assist in the development of the country's RE strategy. However, the past two pandemic years have led to a considerable churn in the bureaucracy and the lockdowns and travel restrictions led to this initiative winding down. A similar situation exists with the programme's engagement in Indonesia (Ministry of Energy and Mineral Resources), which covered research support for solar and wind development.

In keeping with the recommendations of the March 2021 external evaluation, in 2021-22, CSE began its scoping exercise to assess current developments in mini-grids in Africa, Southeast Asia and South Asia, identify key strengths of each country's policy framing and/or implementation support, and assess their potential to provide clean energy access especially to the poor.

CSE's scoping publication, [Mini-Grids a Just and Clean Energy Transition \(Vol. 2: The global](#)

Mini SOE: Facts About Progress Made Till 2022

India has set ambitious renewable energy targets for itself. The achievement of these targets is necessary from the viewpoints of climate and energy security, pollution abatement, and also to secure clean energy for all, including the poor. The State of Environment (SOE) series on RE offers an update on the facts of the progress we have made thus far on utility scale solar, wind, rooftop solar, biomass, mini-grids and hydrogen, with a chapter on manufacturing and the emerging challenge of recycling components.

South) documented and assessed best policy and implementation practices from 10 countries in India, Africa and South Asia. This initial scoping paper was followed by a [convening of sector experts](#) that brought out fascinating instances of country successes—for e.g. Rwanda’s massive increase in electrification—which went up from 10% in 2015 to 38% by 2019, with off-grid solar accounting for a third of the increase. Same was the case with Tanzania, where electrification increased from 15% to 38% between 2010–2019, due partly to off-grid solar. There’s a strong legislative framework in Sub-Saharan Africa, including Tanzania, and in Rwanda that has resulted in a rural electrification programme that has attracted private investors and boosted the solar hybrid mini-grid sector. There are good lessons to be learned also from the step uptick in electrification in the islands of Philippines and Indonesia, which are dependent on mini-grids. This learning can be applied also to our work in India, and also be used to engage with a wider community at pan Africa and global energy and climate forums.



Climate Change programme

PUSHES FOR LOW CARBON GROWTH PATHWAYS TO BUILD A CLIMATE RESILIENT SOCIETY AND PUSHES GLOBAL NEGOTIATIONS FOR AMBITION AND EQUITY

CSE'S CLIMATE Change programme is committed to championing the study of the most pressing issues related to the climate crisis, through the lens of equity and common but differentiated responsibility. The programme's work in 2021–22 was focussed on tracking issues critical in the fight for climate justice, such as enhanced climate ambition through the Paris Agreement, the carbon budget and the politics of carbon sinks. CSE's presence at COP26 in Glasgow, public outreach and advocacy, together with media engagement and training programmes are designed to create multipliers in society for climate action.

Presence at COP26

CSE and DTE reported extensively from the COP26 proceedings in Glasgow from November 6 to 13. Reportage covered the open plenaries as well as the various side events. Our reporters attended a panel discussion at Peoples Summit and a mixer by Nature magazine. Interviews with climate watchers and commentators (for instance, Saleemul Huq, Julia Steinberger and Zeke Hausfather) were also published. A daily article summarising the day's proceedings was widely disseminated.

- **CoP26 progress: China, South Africa boost climate action momentum, but global ambition remains inadequate**
- **CoP26: Rome G20 Summit reaffirms old climate goals, more pressure on Glasgow**

- Mood at Glasgow: Promises galore, substance lacking
- COP 26: Contentious issues of finance, carbon markets pushed to week 2
- CoP26 Diary (Nov 8): Fossil fuel lobby larger than delegation of any country, term missing from draft statement
- CoP26 Diary (Nov 9): India will not update its NDCs till there is clarity on climate finance
- CoP26 Diary (Nov 10): Cover decision draft mentions 'coal', 'fossil fuels' for first time
- CoP26 first draft not good enough; climate finance grossly insufficient: Climate scientist Saleemul Huq
- World headed towards 2.4°C warming despite CoP26, according to 4 assessments
- DTE print cover story: COP 26 Still In Denial

Discussion paper series on climate change strategy

A set of discussion papers was prepared in the lead up to COP26, which assessed the status of country commitments till 2030 to keep the world below 1.5°C or even 2°C temperature rise.

Status of the country commitments till 2030

This analysed the updated NDC targets of the 75 of 191 countries to find that as per current country targets post Paris, the world in 2030 will have merely 0.7% lower total greenhouse gas emissions than when negotiations for a climate change agreement started in 1990. It pushed for stronger near-term targets for 2030, and assessed 2030 targets by country, taking from a sample set of seven entities—China, US, the European Union (EU-27), India, Russia, Japan, and the United Kingdom (UK), which comprised 66 per cent of global CO₂ emissions in 2019. This analysis of the pledges and emissions of the top emitters reveals a large gap between ambition, and the transformative short-term actions needed to decarbonise their economies and limit global temperature rise.

The US and China are definitively not on track to achieve their 2030 targets; India is mostly on track; the UK and EU-27 have seemingly ambitious targets, but lack strong sectoral pathways to achieve them. In all cases, there is no clarity on the sectoral pathways to achieve the 2030 commitments. Claims so far have been long-term targets, and the pathways themselves have revealed an over-reliance on unproven technologies and natural sinks to draw down carbon later in the century, while building in low to moderate emissions reductions in the short-term.

The discussion paper, [India's Emission Intensity Commitment under Nationally Determined Contribution](#), analysed India's emission intensity commitment under NDCs (to reduce emission intensity of its GDP by 33–35% below 2005 levels by 2030). Another discussion paper focussed on [emissions from India's transport sector](#). Although not significant now in comparison to G20 countries, this sector is growing exponentially, and needs an integrated plan for electrification and modal shift to effectively manage GHG emissions.

A series of [Factsheets](#) was also prepared and widely disseminated in the run up to COP26. These factsheets addressed some of the more topical debates and discussions published in Down To Earth, and included factsheets on net zero, coal, role of China, carbon markets, climate finance, adaptation goal, loss and damage, and nature-based solutions.

CSE's publication, [The Numbers Behind Climate Change](#), analysed the carbon budget available; specifically, which countries should be allowed to emit and how much, given that emissions are linked to economic growth.

Biden's Virtual Climate Summit

American president Joe Biden had invited 40 world leaders to a virtual climate summit on April 22–23, 2021. CSE invited journalists, students and climate change researchers for a detailed and comprehensive briefing to understand the issues and concerns that Biden's summit may put on the table. Especially regarding questions of ambition, net zero and equity. CSE's publication, 'Climate Change: Science and Politics' was released on this occasion. The book uses latest statistics, scientific information and data from sources across the world to cover every key aspect of climate change.

- [Book Release & Media Briefing: What's New in Climate Change](#) (282 pax / 2,357 viewed via YouTube/online)
- [Joe Biden's climate plan is investing too little in climate action](#)
- [Biden's climate summit: All eyes will be on the US, come April 22](#)
- [Biden's climate summit: The US needs to walk the talk on fossil fuels](#)
- [Biden's climate summit: Major polluters ramp up climate ambition](#)
- [Video: https://www.youtube.com/watch?v=WgVAYkrPJew](https://www.youtube.com/watch?v=WgVAYkrPJew)

Capacity building

As part of its decades-long engagement with climate change, CSE sees its role in building capacities and understanding on climate science, policy and politics among key constituencies as vital and critical, including among youth, journalists and civil society. A total of three trainings were conducted by the programme in 2021–22—[Introduction to Climate Change: Science, Politics, and Impacts](#) (May, and again in August 2021). A total of 134 persons (64 women) attended these online courses that were each spread over 10-working days. These were designed as an orientation on science, policy and politics of climate change. CSE also organised a course on climate change for school students in January 2022.



Industrial Pollution programme

DESIGNED TO HELP INDUSTRY INTERNALIZE ENERGY AND RESOURCE EFFICIENCY, AND POINT IT TO THE PATH OF LOW CARBON DEVELOPMENT

THE INDUSTRIAL Pollution programme actively contributes to CSE's ongoing multi-sector efforts on clean air, decarbonisation, resource efficiency and circularity at national and state levels.

Coal-free industry in Delhi-NCR

As part of the programme's ambit of addressing pollution and decarbonisation goals for the small- and medium-scale industry sector in Delhi-NCR, CSE engaged with the Haryana State Pollution Control Board to push for shifting diesel generator sets to gas-based generators in Faridabad as part of a wider clean fuels transition strategy.

CSE has been advocating for many years to push industries in Delhi-NCR to transition to cleaner fuels. CSE's 2020 report '[Assessment of industrial air pollution in Delhi-NCR](#)' highlighted the large-scale consumption of coal in NCR districts. As a continuation to this, two publications, '[Analysing fuel policy in Delhi and NCR states](#)' and '[Agro residue for power](#)' were published in the year that highlighted the use of natural gas and biomass to replace dirty fuels (coal and diesel). Taking note of CSE's assessment, the Commission for Air Quality Management (CAQM) directed industries to switch over to gas wherever it is available. In areas where gas is not available, industries have been directed to switch to biomass by the end of 2022. The government has also

specified emission limits for the boilers using biomass as fuel.

CSE identified key hotspots in Delhi-NCR and suggested a mitigation action plan, for instance in Alwar town, a hub of the mineral grinding industry and which causes immense air pollution. CSE's detailed [report on Mineral Grinding](#) and recommendations to control fugitive emissions from this sector in Alwar was submitted to the Rajasthan State Pollution Control Board. A meeting chaired by the Member Secretary took the decision to form a committee to discuss improvements in the mineral grinding guidelines of the state; CSE was requested to submit its recommendations. Similarly, CSE also identified stone crusher hubs as a major fugitive dust emission source in NCR and consequently did a publication '[Implementation challenges of environmental guidelines in the stone crusher industry](#)'. The report clearly highlighted the failed implementation of state guidelines on the ground and has recommended amendments to them.

Resource efficiency and implementation of emissions norms in coal-based thermal power plants (TPPs)

CSE continues to work closely with industry and regulators to push for the implementation of 2015 emission norms—which were to come into effect in 2022—but which have now been pushed back further, and with only a nominal penalty levied against non-complying plants.

In 2021–22, the programme continued to provide research and knowledge support to state pollution control boards of Madhya Pradesh, Rajasthan and Maharashtra on implementing these norms, and is engaged with Central Electricity Authority (CEA) as well as the Ministry of Power (MoP) to ensure the new deadlines are implemented.

A highlight in 2021–22 was that the Rajasthan pollution control board finalised the list of activities, deliverables and timelines in its cooperation with CSE. For the MSME sector, a CSE study suggested measures for pollution control from industries in Jaipur's Vishwakarma Industrial Area.

CSE's comprehensive report, '[Compliance status of Coal based thermal power plants in Rajasthan](#)' in February 2021 was shared with RSPCB. Subsequently, CSE carried out an assessment of impact of delaying the emissions norms for all power plants and the penalties imposed, which showed the penalty system in place is highly inadequate to act as a deterrent. Broadly, CSE's study found that the implementation of PM and SO₂ norms have not been up to the mark and this has been intimated to the power stations for action. With the deadlines pushed to 2024, power stations have been less proactive in upgrading their systems in Rajasthan.

Common boilers to push energy transition in MSME clusters

CSE has pushed for a common boiler facility adapted to industrial clusters, for example in the textile clusters of Panipat. CSE had extensively engaged with industrial associations and factory owners to discuss the feasibility of switching to common boilers. The industrial association of Panipat and representatives of common boiler manufacturer met the chairman of HSPCB and a 30-acre parcel of land has been allotted in Panipat for the installation of a common [boiler for Panipat industries](#), which were hitherto using individual, polluting and wasteful baby boilers. The Panipat facility is an alternate option to PNG, which is expensive. More news articles on this [here](#) and [here](#). CSE pushed this agenda also in Maharashtra, and land has been allotted for a [common boiler facility in Darapur](#), following CSE's report on common boilers.

The programme was able to partially influence the rollback of a proposed dilution of sulphur dioxide norms by the Central Electricity Authority, which wanted standards to be decided based upon location of the plant alone. However, in the amendment, the deadline was extended for compliance, although standards were not diluted. In addition, the Ministry also introduced a penalty mechanism for power plants that do not meet the deadline. CSE is now advocating for specific clauses in the notification, particularly the ones supporting old power station operations and meagre penalty definitions for non-complying plants, to also be dropped.

In Maharashtra, CSE's study, '[Enhanced Strategic Plan towards Clean Air in Mumbai Metropolitan Region](#)', comprehensively assessed the industrial pollution sources and hotspots in the Mumbai Metropolitan Region, and found that medium- and small-scale enterprises (MSMEs) are a major contributor to pollution, while pollution from bigger industrial units located in Chembur, Dombivali and Navi Mumbai is controlled—this shows how norms for large industrial sectors are often more stringent as compared to that for MSMEs. CSE has proposed a comprehensive action plan specific to industrial pollution for the MMR, which includes clean fuels, strengthened air quality monitoring and a deterrence system. The plan also proposed modifications in the siting criteria of such units, with buffer zones added to shield residential areas.

CSE provided its inputs to the ongoing electricity reforms. As part of the deliberations of the Ministry of Power, which is working to revise the country's electricity policy, CSE's presentation to the drafting committee included: the implementation of the 2015 emission norms for coal-based TPPs with particular focus on 'First-run policy' (priority in sourcing electricity from better performing power plants); introducing a GHG reduction strategy for the sector; including provisions to reduce the cost of electricity by reducing inefficiencies in the system rather than discounting the cost to the environment; and, providing affordable electricity at reasonable prices to industries so that the large numbers of small coal-using boilers are not operated, which massively add to pollution especially in the airsheds of larger cities.

A highlight was CSE's study on freshwater demand and use by TPPs. The study found that 50% of India's freshwater-based coal-fired power plants fail to meet water use standards (<https://timesofindia.indiatimes.com/india/fifty-percent-of-indias-freshwater-based-coal-fired-power-plants-fail-to-meet-water-use-standards-says-a-cse>)

Fly ash: A significant policy for the programme in 2021-22 was on fly ash management, which built on the previous years' efforts that highlighted the rampant non-compliance and weak deterrence mechanism. In April 2021, the Ministry of Environment, Forest and Climate Change issued amendments to its fly ash notification, which included an elaborate mechanism of fines to check non compliance, as recommended by CSE. However, CSE's programme is now pushing

Rating pollution regulators: Transparency index

In order to assess the transparency of State Pollution Control Boards, for e.g.in sharing information with the public, a CSE study assessed the data disclosure performance of 29 State Pollution Control Boards and 6 Pollution Control Committees across the country. The report, '[Transparency Index-Rating of pollution control boards on public disclosure](#)', critically evaluated the information shared by SPCBs/PCCs during the last four-five years (2016-21), and used a number of indicators to provide a clearer picture on the type and quality of information shared. The report was widely covered in the mainstream media (more than 80 articles published). Chief Minister of Odisha, Mr. Naveen Patnaik congratulated Odisha State Pollution Control Board for standing first in the country on the transparency Index report of CSE.

Intervention in Lake Victoria

A key development in 2021–22 was the request made by the National Environment Management Council, Tanzania, to prepare an Environmental Monitoring Strategy for Lake Victoria. This is a follow-on of CSE's past efforts in strengthening environmental governance, including impact assessments and compliance & enforcement in the country. A clear multi-sectoral plan of action will evolve this year, following a 'ground-truthing' visit by several CSE research programme teams in August 2022—including those involved in water and sanitation, industrial & environmental governance, and municipal solid waste sectors.

back against the leeway provided to coal power plants to utilize legacy ash over the next 10 years, which will further aggravate the fly ash challenge.

GHG emission reduction: In addition to pollution and public health concerns, lowering GHG emissions from the TPPs sector is equally critical for the country to achieve its climate goals. A key recommendation in CSE's report ([Reducing CO₂ Footprints of India's Coal-Based Power](#), published the previous year), was promoting the use of biomass in coal-based thermal power stations. In May 2022, the Ministry of Power announced its plans to set up a national mission on use of biomass in coal-based thermal power plants.

Building capacities on industrial pollution control, including environmental impact and compliance assurance, remained centre stage in 2021–22. Trainings were conducted on EIA for air polluting industries, and on Continuous Emissions Monitoring System (CEMS) and Continuous Effluent Quality Monitoring System (CEQMS), to build capacities of regulators as well as industry representatives on real time pollution data analytics, certification, verification, accreditation of the system, technical acceptance through calibration, quality assurance, generating accurate, reliable and traceable data, among others aspects.

Global programme

The programme's geographical scope shrank in the past two pandemic years, as its principal partners—government agencies—witnessed a churn in staff, and added to that, governments were preoccupied dealing with the pandemic. In the case of Ethiopia, the past two years of civil strife have meant very little could be achieved for CSE's efforts in the Awash river basin. The programme will need to rebuild its contacts to restart this work.

The programme was more active in Ghana, however. CSE's in-depth guidance for conducting an environmental audit in the industrial sector was shared with the Environmental Protection Agency, Ghana. The '[Inspection and Audit Manual for Environmental Regulators](#)' was a joint effort of EPA and CSE that spanned more than two years. The report was released online and has been uploaded on the EPA-Ghana website for easy access by all stakeholders.

The manual details about how inspections and audits are planned, implemented, reported on and followed up by the EPA are in the public domain. It will help ensure that inspections and audits are done more systematically while ensuring transparency and standardisation of operations among officials of the Agency across the country. Industries can also use the manual and do their self-assessment and inspections even before EPA officials go to their facilities to inspect and audit. Considering growing industrialisation in Ghana, this manual will be an important document to rein in non-compliant industries and keep a tab on the action plans prepared by industries. This will also help EPA to maintain the database of the industries and analyse their environmental performance over a period of time.

Sustainable food systems programme

TO INFLUENCE FOOD AND AGRICULTURE POLICIES AND PRACTICES TO ALIGN WITH SOCIETAL OBJECTIVES OF NUTRITION, LIVELIHOODS AND SAFETY

IN INDIA, the programme's focus areas in 2021–22 included research and advocacy on AMR, advocacy to strengthen labelling on food packaging, and a big push this year on promoting organic and chemical free agriculture.

On AMR, CSE's work built on the experiences of the Global South to focus on the issue of the widespread misuse of critically important antibiotics in farm animals, with particular focus on the dairy sector in India.

CSE convened a closed door meeting with stakeholders from state animal husbandry departments, central regulators like the Central Drug Standards Control Organizations, Central Department of Animal Husbandry & Dairying, state agricultural universities, state food and drug administrations and various state milk federations as well as international organisations including WHO and FAO. The findings of CSE's study on the dairy sector were discussed with the stakeholders.

Research and advocacy on organic food culminated in a [National Conclave on Sustainable Food Systems](#) in April 2022. A key report,



Organic farming: Profitable, productive, sustainable

A key piece of work in 2021–22 was the CSE Report and the 'community release' of this research that analysed the government's own data over the 2004–2020 period in addition to collated evidence from 90 independent studies, that showed clear evidence that organic farming is profitable, productive and sustainable. The report, '[Evidence \(2004–20\) on holistic benefits of organic and natural farming in India](#)', presents evidence on aspects such as crop yield; cost of cultivation, income and livelihood; soil health and environment; and food quality and nutrients.

It is based on two sets of sources. The first includes the results of the All-India Network Project on Organic Farming (AI-NPOF), 2004–19, currently being implemented across 20 centres in 16 states, and which compares results of three approaches—organic, integrated (partly involving use of chemicals) and inorganic (dependent on chemicals). A second source has been collated from 90 scientific studies on organic and natural farming published during 2010–20 in India. CSE's research show long-term evidence and benefits of the 'organic' approach outweigh that of inorganic approach on a host of parameters—including profitability and better income and livelihoods, soil health (e.g. organic carbon, macronutrients, micronutrients, bulk density and rhizosphere microbial population).

This report was 'released' at a major convening of 320 participants (incl. 87 women), including organic champions who have been practicing or promoting organic and natural farming across the country. CSE used the forum to push for a well-funded ambitious programme on organic and chemical-free agriculture; enhanced training to support farmers who opt to make the transition to organic; making available quality organic fertilisers and biofertilisers; strengthening agriculture extension systems; having in place a farmer-friendly certification; and enabling market access.

A subsequent closed-door workshop was convened to discuss the CSE report to discuss specific recommendations to ease the transition to organic and natural farming. Attendees included champion farmers, academics, Government of India participants from ministry of agriculture, and (importantly), state government representatives from Sikkim, Tamil Nadu and Andhra Pradesh.

[State of Biofertilizers and Organic Fertilizers in India](#), was released in the National Conclave. This report showed how the organic and biofertiliser segment was poorly regulated and was witnessing no growth due to poor quality. Spurious biofertilisers were leading to the lack of farmer confidence in such products. It is important for the organic movement to demonstrate improved productivity, and the state of organic and biofertilisers was therefore doing a disservice to the organic agriculture movement. It also pointed out the abysmal government support provided to laboratories for testing, as well as the lack of subsidies. Articles on the need for market access for organic foods, PGS/alternative organic certification to make organic agriculture more farmer friendly; coverage on Farmer Producer Organisations (FPOs) were routinely published in the year.

Campaign on 'Front of Package' (FoP) labeling

CSE had hoped that the December 2000 decision by India's food regulator, FSSAI, to change back-of-pack labelling to include nutrition information as well as labelling on the menu/point of purchase and display regulations, portended a more ambitious approach for accurate, easy to read and understand 'front of packaging' labelling. However, FSSAI's decision to instead move towards a 'health star' ratings scheme—only adopted as a voluntary standard in two countries, Australia and New Zealand—was disappointing for all consumer rights and awareness campaigns in India.

CSE had been invited by FSSAI to join the consultations on food labelling, where the focus of

discussion was on label design, thresholds for nutrients of concern (such as salt, sugar and fats), and what kinds of nutrients it was important to display for consumers to make a more informed choice when purchasing packaged foods. CSE advocates the adoption of stringent thresholds that are based on WHO-SEARO and easy to understand symbols-based warning labels. CSE believes FSSAI's proposed 'Health Star' system is a disservice to consumers, with relaxed thresholds. CSE is coordinating with other consumer groups, including CUTS, Consumer Voice, Global Health Advocacy Incubator, Citizen Consumer and Civic Action Group, the Nutrition Advocacy in Public Interest, among others.

Health Star is misleading as it delegates stars even on what are commonly known to be unhealthy foods; does not include any specific information on nutrients, and so hides more than it tells. There's no real warning to alert consumers on high levels of 'nutrients of concern'. CSE believes this system is bad for nutrition literacy and does not provide enough data for consumers to make informed decisions. As part of the committee, CSE continues to advocate to replace it with FoP labelling system that will better serve the needs of consumers and health.

Global programme: Antimicrobial Resistance (AMR)

The pandemic-related restrictions, including staff attrition in CSE's partner agencies in Zambia and Zimbabwe, led to an inevitable slowdown on the programme's NAP-AMR action planning and implementation assistance to these countries in 2021-22. At the same time, the programme has got wide acceptance on global platforms on AMR, where it has been able to leverage its work in these countries, in addition to its work in India, with particular focus on the 'food/livestock' and 'environmental' aspects of AMR.

Antibiotic discharge from manufacturing, food systems, hospitals: On the global platform, CSE represents the voice of the Global South at the United Nations High Level Dialogue on AMR. CSE director general Sunita Narain serves as a member of the Global Leaders Group (GLG) on AMR. CSE engaged deeply this year with GLG's call to action on antibiotic discharge from manufacturing, food systems and hospitals. This 'statement' called for actions by countries and other stakeholders, clearly identified the need for policy interventions, elaborated on a research and knowledge agenda, and called to strengthen surveillance and monitoring.

This is a first GLG document to appeal for solutions—calls for systematic steps to better manage wastes and discharge from manufacturing, food systems and hospitals—and was consequential, in that it filled a critical gap in the environmental agenda. As this call addressed all systems in one go, it reflects the 'OneHealth' approach (a holistic AMR strategy that explores animal and environmental routes, and the need to transform food 'systems' in the Global South). CSE chaired the technical discussion group on discharge from pharma manufacturing, and assimilated research and comments from GLG members and their representatives which were combined into one statement.

Antimicrobial use in food systems: CSE was actively involved in the Global Leader's Group on AMR (GLG) statement on antimicrobial use in food systems, which concerned the linkages between AMR with antimicrobial use in food systems (e.g., poultry, dairy, aquaculture, swine, crops). CSE was part of the group responsible for drafting this influential global 'call to action' statement. As a member to this GLG, CSE was able to share priorities and perspectives of the Global South, specifically, lessons and priorities drawn from current efforts in India and Africa.

A key aspect here is to push for clear measures on eliminating antibiotics misuse for infection prevention and control, or use as growth promoters, and instead focus on animal health and prevention by non-chemical / non antibiotic solutions. This position faced headwinds as it is ranged against the pharma and food industry interests. CSE's effort was to focus on tighter

World Antimicrobial Awareness Week, November 2021

CSE anchored a series of webinars and public engagements during the World Antimicrobial Awareness Week in November 2021. The programme outlined a structured agenda to address the antimicrobial resistance (AMR) crisis, a 'silent pandemic' that is known to kill about 1.9 million people every year, and heavily impact low- and middle-income countries. CSE called for rethinking how the crisis of AMR can be mitigated in low and middle income countries, and laid out key agendas—the 'development agenda', the 'conservation agenda', the 'environmental' agenda and the 'prevention' agenda. The programme also highlighted the need for sustainable food systems to contain AMR.

Webinar: AMR and the development agenda (192 participants from 15 countries). This explored strategies to ensure that the world can continue to increase food production without depending on chemicals. It underscored the fact that ultimately AMR is a development issue, and that decision makers will be presented with tradeoffs—for e.g. the need to grow more food to ensure food security, but also keep in mind biodiversity and chemical free ways of growing food. The challenge here is to produce enough food, but without chemicals. We therefore need to transform food systems from being chemically dependent. This programme theme will be taken up in the ongoing year.

Webinar: AMR and the Conservation Agenda (135 people, from 16 countries/10 from Africa and Asia). The focus here was the need to conserve the use of critically important antimicrobials.

Webinar: AMR and the Environment Agenda and the Prevention Agenda (158 people from 17 countries / 11 from Africa and Asia). The focus here was clearly on the role of the environment's significant role in AMR crisis—in terms of waste from farms, factories, community and healthcare settings—contributing to the emergence and spread of AMR through environmental routes, and the imperative to rethink and re-invent the way we do business with our food and environment, and how to reduce antibiotic use and improve waste management.

Coverage on AMR Awareness week: This compendium of 25 articles published in [Down To Earth](#) includes contributions from leading experts from the human, animal and environment sectors from India, Africa and Asia.

regulation on critically important antibiotics, and to underscore the point that disease prevention need not necessarily mean prevention through enhanced and unregulated use of antibiotics.

A key highlight of the year was the international [Webinar on the need to preserve critically important antimicrobials](#). The event attracted a large audience of 295 participants, from 33 countries, of which 23 were from Asia and Africa; experts from CSE's existing network in Africa—Zimbabwe and Zambia—also joined the discussions, which was livestreamed.

The programme pushed for the need for uniform messaging in terms of the need for clarity and standardisation of definitions and removing incoherence from recommendations/guidances from the WHO, FAO and OIE documents for nations. CSE's contributions focussed on the three priority sectors of dairy, aqua, poultry. As part of its research, CSE mapped and documented the critically important antibiotics in use, and found the dairy industry to be largest user of these critically important antibiotics that are also used by the healthcare industry.



Solid Waste Management programme

TO ADDRESS MANAGEMENT, TECHNOLOGIES AND REGULATIONS FOR DEALING WITH WASTE GENERATION TRIGGERED BY GROWING AFFLUENCE AND RESOURCE INTENSIVE CONSUMPTION

THE PROGRAMME seeks to mainstream circular economy principles in the solid waste management sector. As part of this, the mandate is to establish two 'model zero-waste' cities, in Agra (Uttar Pradesh) and Gurugram (Haryana/NCR) where CSE provides technical inputs on policy and practice. In addition, CSE anchors a 'Forum of Cities that segregate' and engages with a wide network of 100 cities across India on sharing knowledge and best practices on waste management, including implementing source segregation. Research and capacity building drive the engagement with the city governments by generating new knowledge and evidence-based learning. CSE connects with a wide range of stakeholders, including urban local bodies, regulators, schools, academia and other sector players. These efforts in India form part of the Indo-Norway Marine Pollution Initiative.

Interventions in deep dive cities

In Agra, CSE has an MoU with the Agra Municipal Corporation and supports a sustainable model for decentralised waste management, with particular focus on six municipal wards around the iconic Taj Mahal. Here, as much as 96% of source segregation target has been achieved in a

catchment of 13,000+ households. The city is leveraging CSR funding for a captive treatment and processing unit with a capacity of treating 20 tonne of municipal solid waste per day (CSE is advising this process); once operational, segregated waste sourced from the six wards under the pilot will be treated in a fully decentralised manner, and lessons here will be scaled up to the remaining 96 municipal wards, with the support of an extensive behaviour change campaign coupled with segregated collection, transportation and treatment.

Circular economy principles, solutions: A key challenge was how to deal with waste from *petha* (a popular pumpkin sweet dish) and leather ‘cuttings’ (Agra is India’s hub for the shoe-making industry). A CSE [study on petha waste](#) found that about 130 small industry units were producing 17.8 tonne of petha waste, chiefly peels and unused pulps of raw pumpkin that was finding its ways in *dhalao*s (bins) and clogging the city’s storm water drainage system. The waste is actually a very good quality cattle feed which could be used in the gaushalas (stray cattle shelter) and cattle farms. CSE convened the Agra Petha Association, the Agra Municipal Corporation and the gaushalas, a decision was taken for petha waste to be collected and transported to the gaushalas, whose current requirement of cattle feed is more than what the city generates as waste.

Documentation of best practices in municipal solid waste with NITI Aayog

A key CSE publication of 2021–22, ‘[Waste-Wise Cities: Best practices in municipal solid waste management](#)’ with the active support of NITI Aayog (the Government of India’s policy think tank) documented best practices across various facets of municipal solid waste management across 28 cities of 15 states of India, in 10 thematic areas of municipal solid waste management.

Thematic Area	Cities
Source segregation	Indore, Alappuzha, Panaji
Biodegradable waste management	Mysuru, Vengurla, Bobbili
Material processing	Bhopal, Surat, Jamshedpur, Dhenkanal
Plastic waste management	Gangtok, Bicholim, Kumbakonam
C&D waste management	North Delhi, Gurugram
Sanitary waste management	Pune, Karad
Landfill	Taliparamb, Chandrapur, Ambikapur
Technological innovation	Bengaluru, Leh, Vijaywada, Keonjhar, Kakinada
Innovative model	Paradeep, Thiruvananthapuram, Panchgani
E-waste	Jamshedpur

The selection of cities was based on the implementation experience of the flagship Swachh Bharat Mission 1.0 and performance of the cities in the Swachh Survekshan assessment in 2018–20. These cities aligned with the current priorities on sanitation and solid waste management as laid out in Swachh Bharat Mission (SBM) 2.0, Atal Mission for Rejuvenation and Urban Transformation 2.0 (AMRUT) and Swachh Survekshan 2022 Toolkit.

As the largest leather shoe producing hub in the entire country, Agra produces 150,000 pair of shoes daily. Dealing with the footwear waste—chiefly leather cuttings—has always been challenging for the municipality. CSE research has extensively mapped the units that are manufacturing footwear, both formal and informal, and the study findings will be released later in the year.

As per CSE's MoU with the Municipal Corporation Gurugram (MCG), CSE provides policy, technical, capacity building and handholding support to Gurugram, which is dealing with a colossal amount of municipal solid waste. CSE provided support to streamline the construction and demolition (C&D) waste management as a measure to curb air pollution in the city. CSE has also collaborated with the city to reinforce the functioning of 'bulk waste generators' (BWGs), which contribute approx. 24% of the city's total solid waste. As per the current law in India, all bulk waste generators are mandated to manage their own biodegradable waste in a captive facility or through an authorised concessionaire. Following the mapping of such bulk waste generators in Gurugram, CSE is designing an improved management protocol. CSE initiated a full-scale assessment to institute a sustainable solid waste management system in Gurugram which includes extensive mapping of current situation, gap analysis and a component-wise roadmap to implement for the next three years.

This compendium is a good resource book for the developing cities to get new ideas and learn about the strategies, institutional arrangement, technologies and implementation modalities that have pushed cities to perform well on solid waste management. CSE is currently using the publication as a resource book to build capacities of city governments to manage municipal solid waste management models in a way that they get replicated all over the country. Recognising that these city cases are like learning laboratories, a series of exposure visits are being planned in the coming period, together with using elements of these documented cases in capacity building and for advocacy.

'Forum of cities': The programme strengthened the 'Forum of Cities that Segregate'. The Forum acts as a common platform for the cities to share challenges and learnings. Upon launch of the flagship Swachh Bharat Mission 2.0 in October 2021 that had a heavy thrust on Solid Waste Management, CSE partnered with the Ministry of Housing and Urban Affairs to reinforce implementation of the mission across the country. During this process, CSE developed a toolkit for remediation of legacy waste which occupies a critical space in the whole gamut of the programme. The forum expanded to 241 cities drawn from 26 states to amplify the network.

Policy inputs: The programme extensively engaged with several Union Ministries on policy formulation processes.

- Contributed with critical input to the Ministry of Environment, Forest and Climate Change (MoEFCC) to finalize Extended Producer Responsibility (EPR) notification which was notified as an amendment to the Plastic Waste Management Rules 2018 (amended in 2018)
- Contributed with policy support to the Ministry of Housing and Urban Affairs (MoHUA) with a framework for legacy waste management followed by a draft toolkit
- Provided policy inputs to the Ministry of Chemical and Fertilizers on streamlining the informal plastic producing industries and possible consideration under the EPR policy for plastic waste management
- CSE offered critical feedback to MoEFCC to contribute to India's submission to the United Nation Environment Assembly on the draft plastic treaty

Technical support: CSE Lab

The CSE Lab expanded its capabilities to also include heavy metal analysis in waste as well as in compost. With new instruments, the Lab will now be able to analyse carbon, hydrogen, nitrogen and sulphur percentage in waste and compost, and is a vital instrument for waste characterisation. In 2021–22, the Lab tested 25 samples of compost, faecal sludge, and analysed the presence of heavy metals and toxins to produce science-backed data for evidence-based decision making for regulators, city officials and the private sector on safe waste handling and resource recovery options.

Research and outreach: In 2021–2022, the programme published a total of 10 research publications (see *Annexure: CSE Key outputs*); e-versions of these reports were downloaded 11,176 times from the CSE website. In addition, 30 articles were published by programme team members to promote circularity in waste management sector in the year of reporting. The programme's initiatives were well covered by the news media. A total of 81 news articles were published in national/regional newspapers, in addition to nine videos. Seven public webinars were conducted in the year for 1,658 participants (23% females).

Capacity building: During 2021–22, despite COVID-19 related lockdowns, the programme conducted a total of eight onsite trainings, drawing the direct participation of 196 people, including 69 women participants. Topics included integrated solid waste management; legacy dumpsite remediation; source segregation; plastic waste management; e-waste; and biomedical waste management. In addition, a total of 23 online trainings were organised for 4,113 participants. Of these, six online trainings were organised with MoHUA, with 3,874 participants.

Zero Waste school campuses

CSE's Environment Education programme supports the 'Zero Waste' school campus initiative. In 2021–22, a total of 547 schools, including about 1,000 teachers and 5,000 students from across the country participated in the annual audit, which includes a dedicated section on solid waste management. In this initiative, students audit their own and their school's environmental footprint, including waste minimisation, safe disposal, and reuse in schools and households. Schools' audit reports were then evaluated and given a sustainability rating by CSE.

CSE also engaged with more than 6,000 students in 2021–22 via the Audit@Home: Waste Warriors, an online survey designed to help students assess waste management in their households, get personalised feedback and adopt more sustainable practices over time. A publication, '[Managing Solid Waste in Schools: A Primer](#)' was disseminated in schools. This primer includes a compilation of resources that schools can use and some of the best practices of network schools. Schools in the GSP network were also provided an environmental toolkit on waste management.

A series of workshops and webinars were conducted for school principals, teachers and students on various aspects of solid waste management:

- [Reconvention of GSP Forum of Schools that Segregate, June 2021](#)
- [GSP National Teacher's Meet and Briefing Workshop, July 2021](#)
- [Introducing Solid Waste Management in the Classroom, August 2021](#)
- [Target Zero Waste, December 2021](#)

The programme organised a focus group discussion bringing together 'Model Forum Schools' with a CSE expert on solid waste management. The schools shared their green practices and re-assessed green action plans.

Global programme

In its interventions in the Global South, CSE continued to push the agenda of circularity. Following the mandate secured with Tanzania and Eswatini (Swaziland), CSE used its institutional linkages to expand its reach to research into the entire solid waste management ecosystem in both the countries. During the process, the legal framework, institutional arrangement, devolution of resources to the implementing agencies in urban and rural local governance and the implementation challenges were assessed to gauge the current situation and long-term sustainable solutions were recommended to bring circularity in the plan, approach, strategy and implementation design.

Tanzania: CSE partnered with Ubungo Municipal Council in Dar Es Salaam and by leveraging the partnership, CSE started collaborating with the National Environment Management Council (NEMC), Zanzibar Environmental Management Authority (ZEMA) and the Ministry of Blue Economy, Fisheries and Tourism (MoBEFT) in the semi-autonomous island of Zanzibar under the United Republic of Tanzania. The assessment report, [An Assessment of the Solid Waste Management Ecosystem](#), was released in a virtual meeting which was attended by NEMC, ZEMA and MoBEFT officials. Nine virtual trainings across various facets of municipal solid waste management were conducted by CSE, which was attended by 113 city officials representing all six city councils in Tanzania.

Swaziland (Eswatini): Following extensive research and mapping of the situation on the ground with support from CSE's institutional partner National Disaster Management Agency (NDMA), a comprehensive assessment report titled '[Solid Waste Management in Eswatini – Challenges and Opportunities](#)' was released through a webinar which was also attended by Eswatini Environmental Authority (EEA) to amplify the learnings for implementation on the ground. NDMA and EEA officials agreed to build capacities of their cities with technical support from CSE on waste management technologies and sustainable value chains. They also sought CSE's support on global best practices on sustainable landfill management which could be implemented in the context of Eswatini. Upon release of the report, CSE organised 8 rounds of trainings for regional administration and all the cities thereof on various issues of sustainable waste management practices. During the process of virtual training, 47 city officials were trained by CSE.

Global Forum of Cities on Circular Economy: To augment circularity in municipal solid waste management, CSE felt the need for a network of cities from the Global South. Thus, the 'Global Forum of Cities on Circular Economy' (GFCCE) came into existence. The core objective of creating the forum is to provide a platform for sharing evidence-based learnings, challenges, good practices, research findings, areas for advocacy and capacity building and use them to amplify the work in our respective countries through policy makers, regulators, city governments and other stakeholders. CSE has released a brochure of infographics to present an overview of the vision, mission, and objectives of the proposed GFCCE.

CSE has announced the first 2-days GFCCE workshop in Dar Es Salaam, Tanzania in July 2022 with senior National Government officials from Zambia, Namibia, Uganda, Ethiopia, Mozambique, Ghana, Rwanda, Eswatini, Kenya, Botswana and Tanzania to take the discussion forward for meaningful action on the ground. CSE will also release its scoping report with all the participating nations to present an overview of the challenges and opportunities.



Media Resource Centre

MRC DISSEMINATES TOPICAL, RELEVANT ENVIRONMENTAL INFORMATION AND DATA OF PUBLIC INTEREST AND CONVENES SECTOR EXPERTISE AND THOUGHT LEADERSHIP FOR INFORMED ENVIRONMENTAL ADVOCACY

IN 2021–22, much of CSE’s media capacity building activities were conducted under the aegis of the AAETI School of Environmental Communications. CSE is now actively developing a Resource Hub for Journalists that will serve as a source for information, resources, skill-building avenues and content for media professionals on issues that CSE is engaged in and on those that are being reported in DTE.

Focussed initiatives for the national media

Continuing its engagement with journalists writing in Hindi, the team organised two workshops under its Manthan series—one of them onsite in Nimli, and the other online. A hand-picked group of about 25–30 journalists participated in each workshop, and were addressed by experts from CSE as well as other organisations and agencies.

The second targeted series of workshops also saw some movement—the second event in the series titled Northeast Narratives, a set of briefings designed exclusively for journalists working in India’s northeast, was conducted online for a group of 20 reporters, students, researchers and civil society representatives from the region.

The team has also facilitated participation by media in many other events and webinars



The Pandemic Journal

A comprehensive recounting of the COVID-19 nightmare by over 100 journalists that have seen and covered it all—the virus in its various avatars and mutations. The exodus of millions from our cities, the heartbreaking personal loss. The extreme vaccine chauvinism and meltdown of the globalised world order, and much more. Released online on October 08, 2021.



State of Environment in Figures (SOE)

Data helps unravel and explain this eventful year that witnessed multiple crises, from COVID-19 to climate change. SOE puts together telling data on the impacts and consequences of an eventful year—on the environment, on health systems, vaccine coverage, and on poverty and livelihoods.

The AAD 2022

The media team organised the first post-COVID Anil Agarwal Dialogue in March 2022 at the CSE facility in AAETI, Nimli. The Union Minister for Environment, Forest and Climate Change, Shri Bhupender Yadav, launched the four-day conclave of environmental journalists from all over the country. Over 60 journalists from all over the country, representing almost every key media group, attended, and were addressed by close to 25 CSE as well as external experts. The Minister also released the annual [State of India's Environment 2022](#) report on this occasion.

organised by the different programme teams in CSE. These included an online pre-CoP briefing on climate change focussed on the agenda for the Glasgow conference of parties.

The Hindi language Feature Service was in much demand in this period. This syndicates content and articles from DTE and sends to leading newsmedia subscribers every fortnight. CSE's Feature Services play an important role in disseminating ground-level reportage and voices, and is especially pertinent given the increasing trends of mainstream as well as regional newsmedia slashing budgets for newsgathering. Prominent content partners include *Dainik Jagan*, *Hindustan*, *Amar Ujala*, *Dainik Bhaskar*, *Rajasthan Patrika*, *Daily Chhattisgarh*, *Nav Bharat Times*, *Jansatta*, *Prabhat Khabar*, *Naya Savera*, *Aaj*, *News Laundry*, *Dainik Tribune*, *Web Varta* and *Vishwavarta*.

Continuing partnership with media from the Global South

CSE continues to be a part of an active pan-Africa network of health and environmental journalists. It has taken forward its partnership with the Kenya-based Media for Environment,

Data journalism trainings for media

Five capacity building workshops were conducted for media in 2021–22. These reached out to over 300 working journalists and development communicators, and were designed to fill critical capacity gaps—specifically, to strengthen data-driven reportage and widen exposure to specific sectors.

An online course for African participants—on COVID and water—was also conducted; it was attended by 24 media people.

Science, Health and Agriculture (MESHA) by launching a series of online media briefing and training workshops for African journalists—this series has been named CSE’s Africa Network Media Cafes.

Two workshops have already been conducted as part of this series, with a group of 30 journalists participating in each. Each workshop is designed to focus on one current and key area of interest—the two that have been done covered water and climate change in Africa, and the increasing corporatisation of the seed sector in Africa. The idea behind this series is to engage on a regular and continuous basis with the networks in Africa, and expose them to different ways of looking at potential stories—for instance, the Café on seeds highlighted DTE’s cover story on the subject, something that had remained untouched by the mainstream African media.

One important feature is that each workshop is tagged to a DTE special issue on Africa. This enables cross-programme cooperation within CSE, and gives a solid context and framework to each workshop.

Outreach and information dissemination

Research and advocacy programmes at CSE made a concerted effort to reach out to wider news media—national, international as well as regional; online as well as print editions—by regularly producing a minimum of one press release each week (a total of 56 press releases were disseminated in the year). CSE’s weekly e-newsletter reaches more than 350,000 subscribers.

DTE publications in the year



SoE 2022



SoE in Figures 2022



The Pandemic Journal



Debates that Matter

DTE multimedia output

- 270 training videos, 40 live stream events on CSE YouTube
- 285 videos, 20 webinars livestreamed on DTE YouTube
- Total views on CSE/DTE YouTube in 2021–22: 14.6 million
- Total YouTube channel subscribers 409,000 (144,800 more than last year)
- 241 short explainers/video cards (1–4 minutes duration each)
- 15 long explainers/animations (duration over 8 minutes)
- 12 Features on good news (6–12 minutes each)
- 9-part video explainer series in Hindi
- 13 training video modules for African participants

There was a significant uptick of CSE’s presence in news media—print, online and electronic (TV) in 2021–22. A total of 2,117 articles and programme segments directly mentioned CSE research, or used CSE staff as sources for stories—up from 1,136 the year before. This included national (1,567) as well as regional, including vernacular language news media coverage (355), and news media outside India (195 mentions).

There was a marked increase in DTE’s online outreach in 2021–22. A total of 5,359 stories were published on DTE Print, Web and Hindi editions (up from 4,363 last year). DTE online clocked 21,810,000 yearly ‘visits’ (up 40% from last year). The site attracted 16,449,042 users (up 42% from last year); and 37,789,365 pageviews (up 32% from the last year). There was an increase in DTE Africa segment—510,720 visits (up 137% from 2020–21) and 934,971 page views (up 120% from last year). Importantly, DTE’s Africa section attracted 356,470 new users (a 125% improvement from last year’s tally).

Environment Education

ENGAGES WITH SCHOOLS, COLLEGES AND GREEN EDUCATORS TO IMPART AN UNDERSTANDING OF ENVIRONMENT-DEVELOPMENT LINKAGES AND TO PROVIDE EASY-TO-USE TOOLS TO HELP PUT IN PRACTICE WHAT IS LEARNED

AFTER AN almost two-year pandemic-induced hiatus, 2021–22 saw a gradual, faltering opening up of the education sector. While during the pandemic years, CSE's Environment Education team had stepped up with specialised online initiatives under its Green Schools Programme to engage with the school community within the safe confines of their homes, in 2021–22, not only were online engagements stepped up but some onsite interventions were planned as well.

The focus of the school programme remained largely on four key subject verticals—climate change, solid waste management, air pollution and sustainable mobility, and renewable energy. The programme's hallmark environmental audit for schools was re-introduced in its older avatar (it had been replaced by an 'audit at home' initiative in the pandemic years, as schools were closed).

Plans are also afoot to engage more actively with the team's Green Educator's Network, a collective of over 600 teachers and educators from universities and colleges across India.



Zero-waste school campuses

CSE's Environment Education programme supports the 'Zero Waste' school campus initiative. In 2021–22, a total of 547 schools, including about 1,000 teachers and 5,000 students from across the country participated in the annual audit, which includes a dedicated section on solid waste management. In this initiative, students audit their own and their school's environmental footprint, including waste minimisation, safe disposal and reuse in schools and households. Schools' audit reports were then evaluated and given a sustainability rating by CSE.

CSE also engaged with more than 6,000 students in 2021–22 via the Audit@ Home: Waste Warriors, an online survey designed to help students assess waste management in their households, get personalised feedback and adopt more sustainable practices over time. A publication, [Managing Solid Waste in Schools: A Primer](#) was disseminated to schools. This primer includes a compilation of resources that schools can use and some of the best practices of network schools. Schools in the GSP network were also provided an environmental toolkit on waste management.

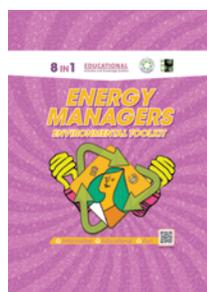
A series of workshops and webinars were conducted for school principals, teachers and students on various aspects of solid waste management. The programme organised a focus group discussion bringing together the 'Model Forum Schools' with a CSE expert on solid waste management. The schools shared their green practices and re-assessed green action plans.



**GSP Primer of
solid waste**



**E-toolkit
(Waste)**



**E-toolkit
(RE)**



**E-toolkit
(Air pollution)**

Trainings, webinars and other events

Targeted online training programmes were rolled out, including the branded and signature programme of the team: an online course for teachers on climate change. Two editions of the course have been rolled out till the time of going to press, with 30 schools teachers enrolled in each edition.

The team, in collaboration with HIMCOSTE, its partner agency in Himachal Pradesh, conducted a series of training workshops for teachers from five districts of Himachal Pradesh. An average of 25 teachers attended each of the five workshops.

An additional 14 meetings and workshops were held over the year to expose teachers to issues of environment and development. These included the National Knowledge Conclave 2021, an annual event which brings together the members of the Green Educator's Network to discuss and debate issues of environment—the 2021 event was held onsite at AAETI and drew about 30 educators.

Gobar Times and Young Environmentalist

On June 5 in 2021, the Environment Education team had launched a new website for young adults, called the Young Environmentalist. This website is now the repository of all content generated by CSE that is attractive for and targeted at school children and their teachers—Gobar Times is featured as an online magazine on this site.

The site also hosts events, contests, etc. for children. Its series of Master Classes—monthly online expert briefings on specific issues ranging from the counting of tigers to monsoons and their vagaries—have become popular, and witness an average participation of almost 300 children and their teachers and family members in every event.

The GSP audits

The team's flagship environmental audit programme for schools, which has over 6,000 schools in its fold, had been replaced by an innovative Audit@Home initiative during the lockdown years. This initiative targeted students at their homes—two of these initiatives on energy and waste saw participation from over 3,000 children each.

With the campuses opening up, the team re-launched the GSP Audit for Schools in November 2021—549 schools across the country submitted the audit reports, which are being examined and analysed. On June 5, the three best performing schools in the state of Himachal Pradesh were awarded the Chief Minister's Rolling Trophy. The team plans to announce the national audit awards in July.

Sustainable Buildings and Habitats programme

THE PROGRAMME CHAMPIONS RESOURCE EFFICIENCY IN THE BUILDING AND CONSTRUCTION SECTOR, AND PUSHES FOR POLICIES AND PRACTICES TO HELP TRANSITION TO URBAN HABITATS THAT ARE SUSTAINABLE AND AFFORDABLE FOR ALL

THE PROGRAMME connects with a wide network of institutions and sector professionals to mainstream policies on thermal comfort, resource efficiency and liveability in the built environment under the wider umbrella of climate prudent developments. The work prioritises these efforts in national, state and local contexts for the building sector; mainstreams its equitable provisions for affordable housing sector and develops strategies for their integration with housing



schemes and building bye-laws. This effort has now expanded across typologies of housing such as rental and self-built housing. CSE studies show that current affordable housing schemes do not incorporate thermal comfort in their planning, design or construction, which will lead to poor uptake and associated energy penalty.

The focus is on promoting convergence between the India Cooling Action Plan 2019, energy efficiency requirements of the Eco Niwas Samhita 2018 in affordable housing, Energy Conservation Building Code 2017 in commercial buildings, National Building Code, urban guidelines, bye-laws, etc. to enable an ecosystem for thermal comfort. Measures are designed and compiled into guidelines to influence the use of alternative building materials and walling assembly, layout, and building design to reduce heat ingress in buildings and improve the ambient environment. This is done primarily to improve thermal comfort to reduce air-conditioned hours and also to improve liveability of the housing stock.

The programme is working with the non-attainment cities of West Bengal, Rajasthan, Odisha and Delhi-NCR, among others, to streamline adoption and implementation of C&D waste management Rules 2016 and Environment (Protection) Amendment Rules 2018. This experience and city level investigation has revealed that cities are just starting to recognise C&D waste as a separate stream and place requisite management systems. The targets set by the National Clean Air Programme and Swachh Bharat Mission 2.0 have given a strong impetus to cities to expedite action. The programme has developed a guidance framework to inform the cities, enhance technical capacity to plan budgets for impact-oriented actions and finally bring them on to a milestone approach taking into consideration the very ground level challenges faced by these cities.

The programme has developed a network of education campuses across India and pushes for resource efficiency through ground action as well as enhancement in academic curricula. A green educational campus not only makes a tangible environmental difference, it also educates those who are directly involved—the staff and students on the campus—as well as others by creating living examples that can be replicated. With this rationale, CSE has been working with these campuses as part of its Green Campus Initiative. From developing environmental baselines to conducting green campus audits and implementing pilots, the programme informs decisions and enables mutual learning by training this network of campuses.

Thermal comfort and affordability in rental housing

CSE has been playing a watchdog role for the rental housing programme of the Pradhan Mantri Awaas Yojana which was notified amidst the COVID-19 outbreak and following the lockdown. Launched with the primary goal to provide a decent shelter to the poor on affordable rents, the scheme encourages use of new and emerging walling materials and provides fiscal support for the same. CSE has developed a guidance framework for this new housing typology that also pushes to address the affordability gap in the housing sector through price-to-income ratio. It is published in the report titled '[Towards Sustainable and Affordable Rental Housing](#)'.

Affordable housing guidelines for Telangana

CSE has developed [Affordable Housing Guidelines for Telangana](#), based on an evaluation of government supported housing for thermal comfort, resource efficiency and sustainability. The findings and recommendations will guide the state in amending schedule of rates to ensure that the contractors use better materials in the future for thermal comfort. The guidelines will be pushed to enable Eco Niwas Samhita compliance and feed into building permission especially for group housing schemes to factor in layout planning, choice of materials and daylighting among other requirements for thermal comfort and liveability ([press release](#))

Guidance framework for inclusive planning of housing for the urban poor with mobility and liveability at the centre

CSE has researched into the low-income settlements, both formal and informal in different cities of India for their physical access to public transport, healthcare facilities and schools. An overview of how the private sector (in multiple cities) is addressing the issue of physical access, how government housing schemes are providing for access in the new housing projects and the ground reality in the informal settlements (case study of Delhi) has been developed and compiled in a publication titled '[Mass Housing and Liveability](#)'.

Guidance for C&D waste management and dust control

CSE has been extending technical knowledge and capacity building support to the non-attainment cities of West Bengal, Rajasthan, Odisha and Delhi-NCR for implementation of C&D Waste Management Rules 2016 and Environment (Protection) Amendment Rules 2018. This has informed and enabled the cities to plan for and outline budgets for more impact-oriented actions on the ground. As cities are only starting to understand C&D waste as a waste stream and need guidance on how to deal with it both practically and in terms of policy, this experience along with the ground issues of cities are captured in the [Guidance Framework for Better C&D Waste Management](#).

Awareness on ventilation in buildings in the wake of COVID-19 pandemic

The COVID-19 pandemic reinforced the need to plan, design and operate buildings in a way to increase ventilation not only to improve thermal comfort but also to flush out infectious diseases and enable healthy living. CSE developed guidelines and a way forward to address ventilation in both residential and commercial buildings and disease-proof the future building stock. These are published in [Breathable Indoors](#).

Green campus action plans for on-ground resource efficiency

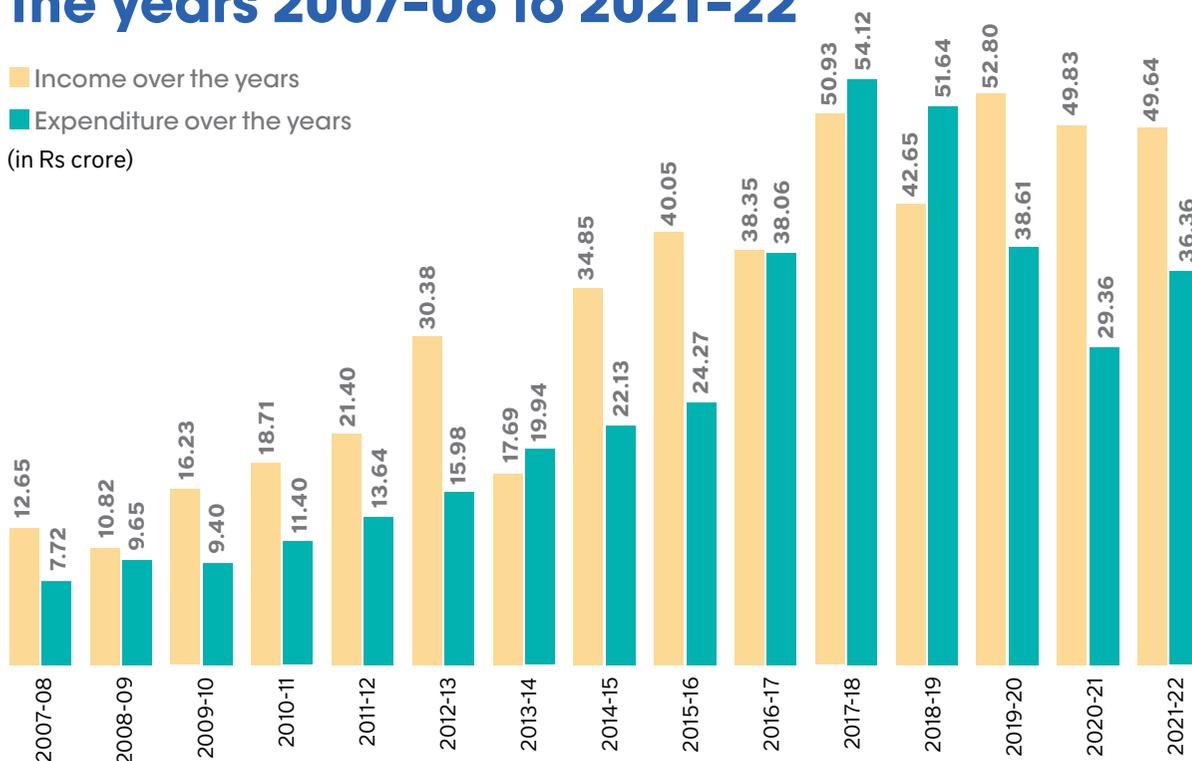
Selected 100 campuses which are a part of CSE's Green Campus Initiative make the Forum of Green Campuses and have submitted their aspirations and commitments in the form of an action plan. CSE has evaluated these action plans to guide the campuses on their aspirations on green initiatives and materialize them. These green initiatives and action plans align with the requirement of the National Assessment and Accreditation Council to rate the universities and colleges on their quality. This has catalysed the demand from campuses to learn and implement green initiatives.

The assessment of action plans is published in a report titled [Green Campus Movement](#). This report was launched at the workshop which is aimed to guide and motivate other campuses to implement sustainability action on ground.

Financial report (2021-22)

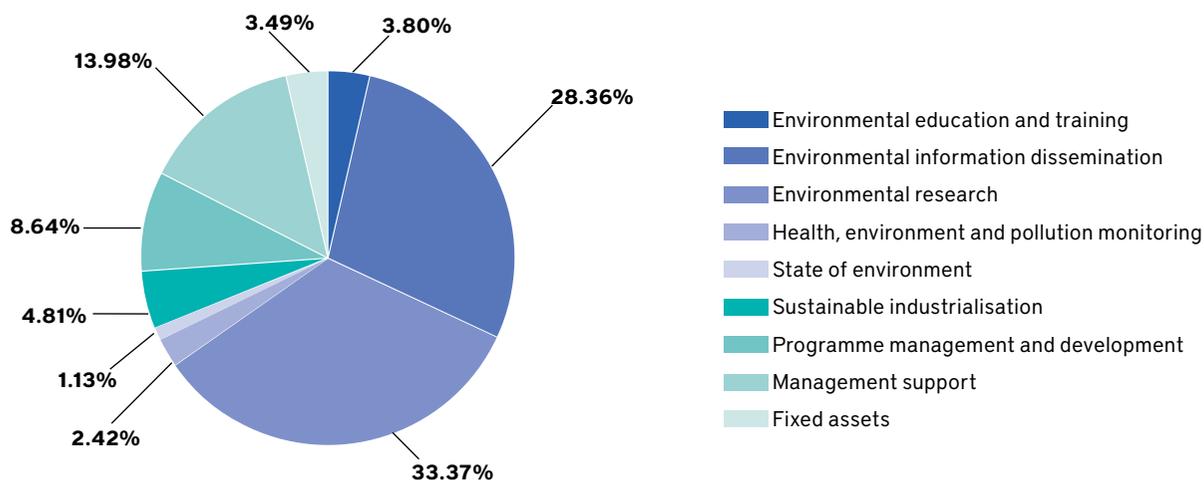
Income and expenditure over the years 2007-08 to 2021-22

Income over the years
Expenditure over the years
(in Rs crore)



Project-wise expenditures

FY 2021-22 (% of total expenditure)



List of donors 2021-22

Grants

Swedish International Development Cooperation Agency (SIDA)

Bill and Melinda Gates Foundation

John D. and Catherine T. MacArthur Foundation

Norwegian Ministry of Foreign Affairs

Bread for the World

Bloomberg Philanthropies

Children's Investment Fund Foundation

Katholische Zentralstelle für Entwicklungshilfe e. V.

Shakti Sustainable Energy Foundation

Heinrich Boll Foundation

New Venture Fund

Royal Danish Embassy

National Mission for Clean Ganga, Govt. of India

National Jal Jeevan Mission, Govt. of India

Dr. Kamla Chowdhury Endowment

Individual donors

S Bhashyam | Pranab Hazra | Mehul Jagdish Rindani | Mehul Rindani | Smita Divan |

K.R.Masilamani | Sandeep Kulkarni | Subhendu Ghatak | Navneet Aggarwal |

Navneet Aggarwal | Rex Joshwa Selvaraj | Manish Jain | Aditya Veer | Mahadevan TS |

Sasidhar Sai N | Periasami Nagappan | Amol Achrekar | Kamal Suchetan | Vinay Majithia

| Rajesh Kumar | Abeer Banerjee | Kuss Singh | Abhishek Kumar Singh | Aditi Sharma |

Ram Krishan Pathak | Aman | Rupak Kumar Singh | Kumar Sarthak | H. Indu |

Bhaskar Kulkarni | Venkata Aravinda Kuncham | Vivek Kumar Srivastava | Liza Jacob |

Om Prakash | Krishna Singh | Sachin Vyas | Society for Promotion of Science &

Technology in India

Annexures

CSE key outputs (2021-22)

Clean Air and Sustainable Mobility programme

Clean Air programme

PUBLICATIONS

- ↘ [Status paper on FE regulations and the way forward on passenger cars, two/three wheelers and heavy duty vehicles \(217 downloads\)](#)
- ↘ Jodhpur hyper local action plan (unpublished, for discussion with Government)
- ↘ Assessment of pollution hotspots to develop hyper-local action plans in Jaipur (unpublished, for discussion with Government)
- ↘ Kota hyper local action plan (unpublished, for discussion with Government)
- ↘ Guidance on Air Quality Management and Clean Air Action Plan for Nigerian cities (unpublished, for discussion with Government)
- ↘ Roadmap for Air Quality Management in Ethiopia (unpublished, for discussion with Government)
- ↘ [Managing Regional Air Quality \(463 downloads\)](#)
- ↘ [Compendium of Clean Air Action in Africa \(325 downloads\)](#)
- ↘ [Delhi AQI analysis for Env Day \(323 downloads\)](#)
- ↘ [Regional Ozone Analysis \(305 downloads\)](#)
- ↘ [Air Quality Tracker Initiative: Prewinter trends in Delhi-NCR and larger IGP cities \(987 downloads\)](#)
- ↘ [Air Quality Tracker Initiative: Smog season analysis in Delhi-NCR and larger IGP cities \(2,321 downloads\)](#)
- ↘ [Air Quality Tracker Initiative: Regional analysis West India \(Gujarat, Maharashtra\) \(650](#)

- [downloads\)](#)
- ↘ [Air Quality Tracker Initiative: Regional analysis South India \(AP, Telangana, Tamil Nadu, Kerala, and Karnataka\) \(539 downloads\)](#)
- ↘ [Air Quality Tracker Initiative: Regional analysis East India \(WB, Bihar, and Odisha\) \(252 downloads\)](#)
- ↘ [Air Quality Tracker Initiative: Regional analysis Central India \(MP and Chhattisgarh\) \(188 downloads\)](#)
- ↘ [Air Quality Tracker Initiative: Regional analysis North India \(Punjab, Haryana, Rajasthan and UP\) \(312 downloads\)](#)
- ↘ [Air Quality Tracker Initiative: Regional analysis North East \(486 downloads\)](#)
- ↘ [Air Quality Tracker Initiative: All India winter pollution summary report \(295 downloads\)](#)
- ↘ [Review of air quality trends in NCAP cities](#)
- ↘ [Compendium of Air Quality Tracker Initiative Reports 2020-21 \(795 downloads\)](#)

TRAINING PROGRAMMES

Onsite Trainings:

- Training on Reinventing on-road vehicle emissions inspection and compliance regime (Nimli, Rajasthan) 10 pax / 04 female
- Onsite training on Revamping on-road vehicle emissions management in cities 18 pax / 0 female

Online Trainings:

- Capacity building -- Guidance on clean air action plans in African cities (Online course, 31January-06February,2022) 45 pax
- [Online training on air quality monitoring and data analytics \(Online Course, 17-30 September, 2021\) 18 pax](#)

- [Online training on Vehicular pollution control \(Online Course, 01-14 July,2021\)](#)
- Capacity building -- Strengthening air quality monitoring, data analysis for clean air action in African cities
- [Online Training Course on Traffic Impact Assessment \(Online Course, 28 may-10 june,2021\)](#)
- Online training on air quality monitoring and data analytics (Online Course, 07- 20 December, 2021)

MEETINGS, SEMINARS, WEBINARS

- Online Network Conversation: Towards Clean Air in Africa 125 pax /35 female
- Online meeting with Federal Ministry of Transport, Nigeria officials
- Online meeting with DRTS officials 18 pax /2 female
- Webinar on air quality and health imperatives in Rajasthan. 50 pax /10 female
- Workshop cum meeting with the nodal officers on compliance reporting and strategy development for compliance in Rajasthan. 100 pax /26 female
- Round-table on fuel economy regulations. 128 pax /46 female
- [Stakeholder workshop on strategies for in-use vehicle emission control in Odisha. 48 pax/8 female \(23 March 2022\)](#)
- Webinar on advances in on-road emissions monitoring. 639 pax / 162 female
- Inception meeting on Odisha state clean air action plan and micro plans. 25 pax/3 female

Sustainable Mobility programme

PUBLICATIONS

- ↘ [How Accessible Are Low-Income Settlements?](#) (734 downloads)
- ↘ [Guidelines for better fleet maintenance](#) (242 downloads)
- ↘ Policy brief on post pandemic bus sector recovery with focus on upcoming bus

- ↘ scheme (unpublished, for discussion with Government)
- ↘ Gap analysis: Mobility strategies for states / cities to integrate indicators, such as PAM, and suggest reforms (unpublished, for discussion with West Bengal Transport Corporation)

TRAINING PROGRAMMES

Onsite Trainings:

- [Training on bus operations and maintenance](#) (Online Course 19-23

[October, 2021\)](#) 16 pax/2 female

Online Trainings:

- [Online training programme on traffic impact assessment](#) (Online Course 1-14 August, 2021) 46 pax / 13 female

MEETINGS, SEMINARS, WEBINARS

- [Round Table: Demystifying E-mobility in Odisha: Strategies for Implementation](#) (22 March 2022)

Electric Mobility programme

PUBLICATIONS

- ↘ [Policy Brief: The case for electric](#) (1,798 downloads)
- ↘ [Demystifying Electric Cars](#) (640 downloads)
- ↘ [Electric Bus Towards Zero emis-](#)

[sion Commuting](#) (1,906 downloads)

- ↘ Discussion note: EV ride sharing aggregator (unpublished for private circulation)
- ↘ Electric Vehicle policy draft for West Bengal (unpublished, for discussion with Government)

MEETINGS, SEMINARS, WEBINARS

- [The Case for Electric](#) (National level stakeholder meeting on zero emission mandate. 242 pax / 61 female)
- [Workshop on Empowering E-Mobility in Cities: how to expedite transition towards electric mobility](#) (32 pax / 06 female)

Industrial Pollution programme

PUBLICATIONS

- ↘ [Water inefficient power: Implementing water norms and zero discharge in India's coal power fleet](#) (1808 downloads)
- ↘ [New Systems, Old Habits](#) (833 downloads)
- ↘ [Is Sulphur dioxide a problem in India's ambient air?](#) (1436 downloads)
- ↘ [Factsheet on new norm: A license to pollute](#)
- ↘ [Norms in name alone: Will thermal power plants meet the deadlines for emission norms?](#) (433 downloads)
- ↘ [Implementation Challenges of environmental guideline in the stone crusher industry](#) (261 download)
- ↘ [CEMS Certification Systems in India: CSE proposal](#) (538 download)
- ↘ [Transparency Index: Rating of](#)

[pollution control boards on public disclosure](#)(1589 downloads)

- ↘ [Ghana: Inspection and Audit Manual](#) (403 download)
- ↘ [Perform Achieve and Trade \(PAT\) scheme of thermal power plants: A critique](#) (957 download)

TRAINING PROGRAMMES

Onsite Trainings:

- Training on TPP and environmental management (Nimli, Rajasthan, 14-17 December, 2021) 27 pax / 2 female
- [Training on resource efficiency and pollution management in small scale sector](#) (Nimli, Rajasthan, 9-12 March, 2022) 27 pax / 6 female
- [Integrated online & onsite Training Programme on Continuous Emission and Effluent Monitoring System](#) (Nimli, Rajasthan, 23-26

[March, 2022\)](#) 31 pax / 2 female

- Advance training programme on continuous emission and effluent monitoring systems (Nimli Rajasthan, (27-29 September 2021) 29 pax/5 females

Online Trainings:

- Online training on water audit and conservation in industries (Online Course, 22 November-5 December, 2021) 140 pax
- [Integrated online & onsite Training Programme on Continuous Emission and Effluent Monitoring System](#) (Online Course, 7-15 December, 2021) 72 pax/8 female
- [Online training on water audit and conservation in industries](#) (19 July-1 August, 2021) 190 pax / 57 female
- Online training on CEMS (Online Course, 14 July- 27 July, 2021) 65 pax / 10 female

- Global Online training on “Water audit for water intensive industrial sectors” (28 February-2 March, 2022) 101 pax / 36 female
- Online training on EIA (Online Course, 1-10 July,2021) 182 pax / 95 female
- CSE-Swedish Environmental Protection Agency Online Training Programme on CEMS & CEQMS (Online Course, 1-12 October, 2021) 84 pax / 19 female
- Online training on environmental law (Online Course, 1-10 September, 2021) 192 pax /

- 80 female
- Integrated online and onsite training programme on EIA (Online Course, 8-17 December, 2021) 132 pax / 64 female
- Online training programme on developing action plan to control air pollution with Swedish Environmental Protection Agency (1-10 December 2021) 91 pax, 22 females

MEETINGS, SEMINARS

WEBINARS

- Webinar on water inefficient

- power (Online, 26 August 2021) 260 pax / 100 female
- Asia-Africa workshop on improving impact assessment process (Online, 22-24 September 2021) 40 pax / 18 female
- Tanzania: Online Roundtable to form working group to clean Lake Victoria (Online, 12 October 2021) 29 pax / 8 female
- Webinar on CEMS (Webinar, 23 April 2021) 13 pax / 1 female

Urban Water-Waste Management programme

PUBLICATIONS

- ↳ Pan-UP: Final report on the status of 60 plants in UP based on visits and discussions
- ↳ Brochure/webpage and calendar of activities for NMCG programme roll out
- ↳ Report on “Roadmap for WSUDP- Stormwater harvesting in UP (603 downloads)

TRAINING PROGRAMMES

Onsite Trainings:

- Chunar: Training of sanitation workers on Swachh Survekshan 2022 and Safaimitra Suraksha Challenge 25 pax / 7 female
- Advanced Residential Training on Decentralised Wastewater Management and Local Reuse (With Solid waste team) (Nimli, Rajasthan) 63 pax / 11 female
- Advanced residential training on Urban waterbodies rejuvenation and management (Nimli, Rajasthan, 22-24 February, 2022) 31 pax / 5 female
- CSE Training of Trainers (Nimli, Rajasthan) 14 pax / 7 female
- Advanced training on Decentralized wastewater, Faecal Sludge and Septage Management (Nimli, Rajasthan, 26-28 October, 2021) 22 pax / 5 female
- Advanced Training on ‘ Planning and Designing for Decentralised

Wastewater Management and Local Reuse’ (Nimli, Rajasthan,21-23 December, 2022) 32 pax / 10 female

- Pan UP- Training of desludgers on health and safety in Prayagraj (Online, 16-17 February, 2022) 45 pax
- Advanced Training on “Water Sensitive Urban Design and Planning” (Nimli, Rajasthan, 30 November-2 December, 2021) 30 pax / 14 female
- Pan UP- Training on Health and safety of desludgers in Ghaziabad (Nimli, Rajasthan, 24-25 February, 2022) 63 pax
- Awareness cum orientation programme of Self Help Groups (SHGs) on ‘Making water & sanitation sensitive cities’ (Lucknow, 1st November, 2021) 100 pax

Online Trainings:

- Online training on Water Sensitive Urban Designing and Planning (Online Course 26 May- 6 June, 2021)
- South Africa: Online training on citywide water and climate resilience (Online Course 25 January-6 February, 2022)
- Online training on tools & approaches for citywide sanitation (Online Course 5-14

June, 2021)

- Online training on GIS- Part A (Paid and partially sponsored) (Online Course 23 June- 9 July, 2021)
- Online Training on Preparation of SFD for South Asia and Africa (Online Course)
- Online Training on Decentralized Wastewater Treatment Systems – NMCG (Online Course 7- 22 October, 2021) 157 pax / 32 female
- Online Training on WSUDP for Ganga basin(Online Course- September 7-20, 2021) 100 pax / 35 female
- Online Training on Urban Water-bodies Management– Issues, Challenges & Potential of Making Water Sensitive Cities (Online Course 24 September-4 October, 2021) 150 pax / 30 female
- Online Masterclass cum CSE school Alumni Impact Workshop(Online Course 11-12 August, 2021) 459 pax / 165 female
- Online advanced training on GIS- Part B (Online Course 28-30 July,2021) 64 pax / 35 female
- Basic Online training on Preparation of Shit Flow Diagram (SFD) (Online Course 2 June, 2021) 60 pax / 14 female
- Advanced Online training on Preparation of Shit Flow Diagram

(Online Course 9-19 April, 2021)
35 pax / 11 female

MEETINGS, SEMINARS,

WEBINARS

- *Webinar cum interactive workshop on scheduled desludging (Online, 23 July 2021) 447 pax / 147 female*
- *Bijnor: Launch of learning centre on model OSS and workshop of stakeholders. 38 pax / 1 female*
- *Round Table cum workshop for WSUDP to be incorporated into city planning in South Africa (Online, 25 August 2021) 42 pax / 21 female*
- *Webinar on Decentralised Nature Based Wastewater Treatment Solutions for Improved River Health (Online, 21 October 2021) 484 pax / 117 female*
- *Online Webinar on Urban Water-bodies Management- Issues, Challenges & Potential of Making Water Sensitive Cities (Online, 30 September) 300 pax / 120 female*

- *Launch & Inaugural Webinar for training programme on Shit Flow Diagram (SFD) (Webinar, 02 April 2021) 62 pax / 14 female*
- *Bijnor: City-level stakeholder workshop and CSTF meeting for dissemination of learnings from exposure visit. 17 pax / 02 female*
- *Webinar on Urban Ground Water Management in Ganga Basin- NMCG (Online, 04 August 2021) 596 pax / 368 female*
- *Chunar: City-level stakeholder workshop and CSTF meeting for dissemination of learnings from exposure visit. 38 pax / 03 female*
- *Launch Meeting - NMCG Project (Online, 02 July 2021) 472 pax / 180 female*
- *Pan-Asia Capacity Building Workshop/training for water-wastewater and climate change resilience planning (Online, 09 February-14 April 2022) 179 pax / 80 female*
- *Webinar on WSUDP in Ganga*

basin cities (Online, 27 July 2021) 472 pax / 180 female

- *Online round table with potential partners in Africa for water-wastewater and climate change resilience. 131 pax / 47 female*
- *Training of Trainers Workshop: Shit Flow Diagram (SFD) Orientation Workshop (Online) 41 pax / 17 female*
- *Webinar- Planning cum Consultation Workshop for CSE - NMCG initiative on 'Making Water Sensitive Cities in Ganga Basin', July 02, 2021*
- *Quarterly City sanitation task force meeting in Chunar- 20 pax*
- *Quarterly City sanitation task force meeting in Bijnor- 20 pax*

NEWSLETTERS:

- *Quarterly collateral on amount of faecal sludge treated in front runner cities of Uttar Pradesh.*
- *Bimonthly newsletter of School of Water and Waste*

Environment Monitoring Laboratory

TRAINING PROGRAMMES

Onsite Trainings:

- *Basic Laboratory Training in FSM (Nimli, Rajasthan 13 -17 September, 2021) 18 pax / 14 female*
- *Smart and affordable technologies to monitor the drinking water quality, accompanied by field exposure visit (Nimli, Rajasthan 15-16 March, 2022) 17 pax / 2 female*
- *Resource recovery from faecal*

sludge: Advanced Laboratory training on analysis of dried faecal sludge and co-compost. 18 pax / 9 female

- *Advanced Laboratory training on pathogen analysis in wastewater and faecal sludge. 18 pax / 10 female*

Online Trainings

- *Ensuring safe drinking water in rural homes – optimum utilization of laboratory resources for scaling-up testing (Online Course 17-18 February, 2022) 97 pax / 34 female*

17-18 February, 2022) 97 pax / 34 female

- *Ensuring safe drinking water in rural homes – optimum utilization of laboratory resources for scaling-up testing (Online Course 27-28 January, 2022) 95 pax*
- *Ensuring safe drinking water in rural homes – optimum utilization of laboratory resources for scaling-up testing (Online Course 15-16 November, 2021) 137 pax / 42 female*

Rural Water-Waste Management programme

PUBLICATIONS / AUDIO-VISUALS

- ↳ *Tanzania: Policy strategies to augment Ground Water through Rainwater Harvesting*
- ↳ *Tanzania: The State of Sanitation*
- ↳ *Three audio visuals developed (twin pit design (Hindi and*

English) and design of biogas-linked toilets)

TRAINING PROGRAMMES

Onsite Trainings:

- *Long-term sustainability, security, recharge and management of*

drinking water sources and rainwater harvesting technologies, accompanied by field exposure visit – Training 1 (Nimli, Rajasthan, 22-26 February, 2022) 13 pax / 3 female

- *Training on District Level Planning*

of FSM - Training 1 (Nimli, Rajasthan) 22 pax / 1 female –Oct 4-7, 2022.

- Training on District Level Planning of FSM - Training 2 (Nimli, Rajasthan, 20-24 December, 2021) 29 pax / 6 female

Online Trainings:

Drinking water

- Sustainable grey water management and reuse at community level – Training 3 (Online Course 7-8 March, 2022) 149 pax / 16 female
- *Tanzania - In-depth focussed training for expert team on GIS tools for planning and designing rainwater harvesting at village level (Online Course 23 September-2 October, 2021) 19 pax / 3 female*
- Affordable technologies for groundwater recharge to sustain drinking water source in areas of declining groundwater – Training 2 (Online Course 20-21 January, 2021) 68 pax / 12 female
- *Uganda - In-depth focussed training for expert team on GIS tools for planning and designing rainwater harvesting at village level for Uganda (Online Course 23 September-2 October, 2021) 19 pax / 4 female*
- Sustainable grey water management and reuse at community level – Training 2 (Online Course 15-16 December, 2021) 51 pax / 11 female
- Affordable technologies for groundwater recharge to sustain drinking water source in areas of declining groundwater – Training 1 (Online Course 25-26 November, 2021) 69 pax / 10 female
- Sustainable grey water management and reuse at community level – Training 1 (Online Course 28-29 October, 2021) 67 pax / 12 female
- *Tanzania: Training on rainwater harvesting and groundwater*

recharge (Online Course 27 July-09 August, 2021) 67 pax / 16 female

- Uganda and Tanzania - Using GIS tools for planning groundwater recharge - Level 3 (Online Course 07-15 March, 2022) 50 pax / 11 female
- Uganda and Tanzania -short course on long term sustainability, recharge and management of water sources (Online Course 14-23 February, 2022) 51 pax / 11 female
- Uganda and Tanzania - Using GIS tools for planning groundwater recharge - Level 2 (Online Course 17-25 January, 2022) 50 pax / 11 female
- Pan Asia Africa training on using GIS tools to locate and plan recharge options for sustainability of drinking water (Online Course 1-10 December, 2021) 77 pax / 27 female
- Tanzania: Training on rainwater harvesting and groundwater recharge (Online- July 27 – August 9, 2021)- 67 pax / 16 females

Sanitation

- *Nigeria - In-depth focus training for expert team of Nigeria on design aspects of onsite and offsite treatment of Faecal sludge (Online Course 27 September-12 October, 2021) 12 pax / 4 female*
- *Uganda - In-depth focus training for expert team of Uganda on design aspects of onsite/off site treatment of Faecal sludge (Online Course 27 September-12 October, 2021) 10 pax / 5 female*
- *Tanzania -In-depth focus training for expert team of Tanzania on design aspects of onsite/off site treatment of Faecal sludge (Online Course 27 September-12 October, 2021) 12 pax / 4 female*
- Uganda, Tanzania and Nigeria - Short course on onsite sanitation systems (Online Course 2-10

February, 2022) 211 pax / 62 female

- Uganda, Tanzania and Nigeria - Short course on greywater management (Online Course 24-31 January, 2022) 179 pax / 51 female
- Africa – south Asia level training on FSM (Online Course 21-30 August, 2021) 100 pax / 74 female
- Haryana: Training on safe toilets and FSM (Online Course 21-30 July, 2021) 50 pax
- Tanzania: Training on safe toilet technologies and faecal sludge management in rural areas- (Online- 17th- 31st May, 2021)- 65 pax / 14 females

MEETINGS, SEMINARS, WEBINARS

- Pan Asia Africa Webinar on different technologies for treating sludge at treatment plants -urban-rural convergence (Online, 01 February 2022) 245 pax / 71 female
- National level 2 days Virtual Workshop: on mainstreaming faecal sludge management at district level (Online, 29-30 November 2021) 100 pax / 24 female
- *Tanzania: Publication release meeting on the 'state of containment and disposal systems (Online, 30 June 2021) 35 pax / 14 female*
- Rajasthan: Online Orientation of Rajasthan officials on FSM (Online, 15 July 2021) 151 pax / 05 female
- *Africa – south Asia level meeting on FSM (Online, 20 August 2021) 201 pax / 56 female*
- Tanzania: Publication release meeting on rainwater harvesting and groundwater recharge (Online, 12 October 2021) 41 pax / 12 female

Renewable Energy programme

PUBLICATION

- ↳ *Mini SOE: Facts About Progress Made Till 2022*
- ↳ *Mini-Grids a Just and Clean Energy Transition* (Vol. 1: India scoping study)
- ↳ *Mini-Grids a Just and Clean Energy Transition* (Vol. 2: The global South)

MEETINGS, SEMINARS,

WEBINARS

- *Webinar: Clean Energy for Energy Access: Mini-Grids and Clean Cooking – Dec 14-16, 2021*
- *Webinar: Mini-grids in the global South (a convening of sector experts): May 30, 2022*

DTE ARTICLES

On Renewable Energy

- *Supply 24x7 power to reduce diesel genset use: Draft electricity rules*
- *Indian Railways likely to become world's first 'net-zero' carbon emitter by 2030*
- *India's gas push: Import dependency is growing. Are we on the right track?*
- *Union Budget 2022-23: Where does renewable energy fit in this year?*
- *Repowering: Why Tamil Nadu's old wind turbines are still awaiting replacement*
- *Second-generation bioethanol: It is time to launch it headlong*
- *Is ethanol blending in petrol really green?*
- *Why flooding raises alarm over bearing of hydropower plants on the Himalayas*
- *Decentralised renewable energy*

solutions offer great promises for healthcare facilities

- *Renewable Energy Certificates: How new amendments provide safety net to renewable power developers*
- *Can biomass co-firing offer a viable solution to coal shortage and stubble burning?*
- *Energy crisis: Expensive, unreliable source of electricity, coal in spotlight*
- *It is time to move on to next phase of power reforms*
- *Energy consumption, related emissions expected to increase through 2050: IEA*
- *Is the Union Budget 2022-23 renewable energy friendly?*
- *MNRE's new policy framework recognises distributed renewable energy as solution for uplifting rural economy*

On Solar rooftop & energy storage

- *Rooftop solar generation: Why Delhi government schools fare better than others*
- *Small distributed solar projects not eligible for subsidy, Gujarat Urja Vikas Nigam clarifies*
- *Planning to install rooftop solar panels? How about some grass beneath it*
- *India adds highest rooftop solar capacity for a quarter in July-Sept: Mercom*
- *Rooftop solar : How will India's new net metering norms play out*
- *Rooftop solar: Why India is now considered to be a laggard globally*
- *Why rooftop solar and storage offers a viable future for India*
- *Learnings from the German*

storage model: How it is helping stabilise the grid

On Utility Scale Solar: Status and development

- *Rise in Chinese solar PV module price: The implications on global solar growth story*
- *How the renewable energy ministry's new order will impact India's solar energy target*
- *There is a demand-supply mismatch in solar manufacturing. Is India making the right choice?*
- *Electricity (Amendment) Bill, 2021: How it can play out*
- *Renewable energy integration in India: Ways to maximise solar, wind power system*
- *Rooftop solar energy: Revised net metering cap in the new draft electricity rules means good news*
- *Renewable Energy Certificates: How new amendments provide safety net to renewable power developers*

On wind energy

- *Europe bans disposal of decommissioned wind turbine blades in landfills: A step towards life cycle sustainability*
- *India's offshore wind energy: A roadmap for getting started*
- *Can painting a blade black save Great Indian Bustards from wind turbines?*
- *Can drones help spot faults in offshore wind turbines?*
- *Making India energy-independent by 2047: A look at PM Modi's blueprint*
- *No offshore wind project has commenced in India: Are we on track for 30 GW by 2030?*

Climate Change programme

PUBLICATIONS

- ↳ *Carbon Budget Factsheet (745 downloads)*
- ↳ *Greenhouse gas emissions by Indian transportation sector*

- ↳ *On the road to CoP26: Discussion paper series*
- ↳ *Climate Change: Science and Politics*

TRAINING PROGRAMMES

- *Training: An Introduction to Climate Change - Science, Politics, and Impacts – (Online Course, 17-28 May, 2021) 68 pax /*

- 31 female
- Training: An Introduction to Climate Change - Science, Politics, and Impacts – (Online Course, 16-27 August, 2021) 59 pax / 33 female
- Climate Change for school students (Jan 22, 2022)

MEETINGS, SEMINARS, WEBINARS

- *Global release of the book 'Climate Change: Facts and Politics'* (April 20, 2021) 282 pax / 278 female
- Pre COP 26: Online Media Briefing on Climate Change: What is Up for Discussions in Glasgow? (October 27, 2021) 74 pax / 40 female

DTE ARTICLES

- *CoP26 progress: China, South Africa boost climate action momentum, but global ambition remains inadequate*
- *CoP26: Rome G20 Summit reaffirms old climate goals, more pressure on Glasgow*
- *Mood at Glasgow: Promises galore, substance lacking*
- *COP 26: Contentious issues of finance, carbon markets pushed to week 2*
- *CoP26 Diary (Nov 8): Fossil fuel lobby larger than delegation of any country, term missing from draft statement*
- *CoP26 Diary (Nov 9): India will not update its NDCs till there is clarity on climate finance*
- *CoP26 Diary (Nov 10): Cover decision draft mentions 'coal',*

- 'fossil fuels' for first time*
- *CoP26 first draft not good enough; climate finance grossly insufficient: Climate scientist Saleemul Huq*
- *World headed towards 2.4°C warming despite CoP26, according to 4 assessments*

DTE PRINT COVER STORY: COP 26 STILL IN DENIAL

- *Dragon in the room: Why China's target of carbon neutrality is misleading*
- *Act now : How climate action in this decade can prevent catastrophic global warming later*
- *IEA Roadmap modelling its way out to remove emissions with tech*
- *EU's new climate proposal is vast. But is it transformational?*
- *There is still time to reverse the climate crisis'*
- *Global warming limit of 1.5°C may be breached by 2040, says new IPCC report*
- *Humans have caused almost 100% of global warming, says new IPCC report*
- *Carbon budget will exhaust in 10 years at current emission levels: IPCC report*
- *ET Now TV Panel: IPCC report flashes 'code Red for humanity' / India Development Debate*
- *Why experts think IPCC's report is 'code red for humanity' and can't be taken lightly*
- *COP26: Pressure Mounts for Net Zero Emissions, But Will India Commit?*
- *ABP News Podcast: Team*

members spoke on a 20-minute segment on Aug 10, 2021 about the new IPCC report.

- *Let's talk land sinks: Are they enough to beat global warming*
- *India's climate action 'highly insufficient': New rating system*
- *Opinion: Climate Change Is A Healthcare Emergency*
- *Russia blocks UN resolution on climate change fearing unwarranted western intervention*
- *Record demand for coal power in 2021, way off Net Zero: IEA*
- *Most vulnerable countries unable to access Green Climate Fund for adaptation*
- *How surging oil prices threaten world's climate goals*
- *How green is Union Budget 2022-23?*
- *Corporate net zero promises found to be insufficient and relying on cheap offsets*
- *Atlas of human suffering: IPCC report stresses on interconnections among climate, biodiversity, well-being*
- *China and the developed world have already appropriated 70 per cent of the carbon budget available to keep global temperature rise to 1.5C (DTE cover story)*
- *TV segment on Mirror now on March 16, 2022 discussing heat wave in Mumbai*
- *IPCC adaptation report videos with Arnab for DTE YouTube channel*
- *First Post interview*
- *Navodaya Times*

Municipal Solid Waste programme

PUBLICATIONS

- ↘ *Report: Plastic Recycling- Decoded (1420 downloads)*
- ↘ *Toolkit for Decentralized Organic waste management*
- ↘ *Toolkit for Dumpsite Remediation*
- ↘ *Decentralized Management of segregated organic waste (1072 downloads)*

- ↘ *Petha Waste Management in Agra City: An Assessment*
- ↘ *Solid Waste Management in Eswatini: Challenges and opportunities*
- ↘ *Tanzania- An assessment of the solid waste management ecosystem*
- ↘ *Waste-Wise Cities: Best Practices*

in Municipal Solid Waste Management

- ↘ *Status report on the treatment of segregated waste in TTZ pilot*
- ↘ *Toolkit for Inorganic Waste Management*
- ↘ *Stakeholder mapping in plastic value chain*

- ↳ Gurugram BWG report on management of organic waste
- ↳ Report on Municipal Solid Waste Management Assessment/road map on Gurugram
- ↳ [Sanitary Waste Management in India: Challenges and Agenda](#)
- ↳ Study report on leather waste management

TRAINING PROGRAMMES

Onsite Trainings:

- Onsite training on Integrated Solid Waste Management for city officials from forum of cities that segregate and zero waste cities (Nimli, Rajasthan, 23-26 November, 2021) 31 pax / 6 female
- [Training of city officials and other stakeholders from Forum of Cities that Segregate, Agra and Gurugram on "Designing a sustainable solid waste management system in Cities based on the principle of circular economy" \(Nimli, Rajasthan\) 29 pax / 2 female](#)
- Training on City Solid Waste Action Plan (CSWAP) for City and State Officials (Nimli, Rajasthan, 28-31 March, 2022) 46 pax / 8 female
- Training on City Solid Waste Action Plan (CSWAP) for City and State Officials (Nimli, Rajasthan, 15-18 February, 2022) 17 pax / 2 female
- Onsite training on CSWAP and CSAP (Nimli, Rajasthan, 16 pax / 5 female)
- Capacity building of city officials to develop legacy waste management plans under SBM 2.0 (Nimli, Rajasthan, 35 pax / 7 female)

Online Trainings:

- [Online training programme on source segregation and home composting \(Online Course, 26-30](#)

- [July, 2021\) 28 pax / 9 female](#)
- [Online Training on Sustainable Plastic Waste Management \(Online Course, 30 March-13 April, 2021\) 45 pax / 24 female](#)
- [Online training programme on E-waste Management \(Online Course, 28 June- 6 July, 2021\) 73 pax / 19 female](#)
- [Online training on importance of IEC \(Information, Education and Communication and BCC \(Behaviour Change Communication\) to improve segregation of waste at source. \(Online Course, 7-11 February, 2022\) 70 pax / 12 female](#)
- Practitioners knowledge building series on collection and transportation (Online Course) 10 pax / 2 female
- Practitioners knowledge building series : E-waste management (Online Course) 31 pax / 8 female
- [Practitioners knowledge building series on Source segregation and Home composting \(Online Course, 27-29 September, 2021\) 7 pax / 1 female](#)
- Practitioners knowledge building series : Healthcare waste management (Online Course) 16 pax / 6 female
- Practitioners knowledge building series on Waste Treatment and processing (Online Course) 18 pax
- Practitioners knowledge building series : Plastic Waste management (Online Course, 17-21 January, 2022) 13 pax / 5 female
- [Online training programme on dumpsite remediation and landfill management \(Online Course, 20-27 August, 2021\) 91 pax](#)
- Practitioners knowledge building series : Scientific landfill operations (Online Course) 16 pax
- Orientation training to 15 selected

- consultants on all the 9 Thematic areas for CSE-NITI Study (Online Course) 15 pax / 3 female
- [Online training on e-waste management \(Online Course, 14-22 February, 2022\) 34 pax / 16 female](#)
- Online training on plastic waste management in India (Online Course, 28 January-6 February, 2022) 25 pax / 12 female
- Online training on Decentralized management of segregated organic waste (Online Course, 30 August-6 September, 2021) 45 pax / 22 female
- Online training on Waste Management Rules (24 Sep – 8 Oct 2021) 14 male/ 12 female)

MEETINGS, SEMINARS, WEBINARS

- [Release of plastic recycling report with small scale industries and regulators \(Online, 05 August 2021\) 300 pax / 02 female](#)
- [Webinar based on findings of DTE analysis- Managing COVID-19 Biomedical waste in India \(Online, 30 June 2021\) 241 pax / 103 female](#)
- Release of E-swatinini report and webinar to discuss the way forward. 08 pax / 03 female
- [Roundtable on formalizing role of Informal Sector report in waste management \(Online, 22 July 2021\) 759 pax / 01 female](#)
- [Release of report and webinar to finalize work plan based on key recommendation - Tanzania \(Online, 03 August 2021\) 30 pax / 06 female](#)
- [Webinar on decentralized management of segregated organic waste report.\(Online, 12 August, 2021\) 302 pax / 98 female](#)

Sustainable Food Systems programme

PUBLICATIONS

- ↳ [Report of Africa-Asia AMR workshop - Containing the Silent](#)

[Pandemic of Antimicrobial Resistance](#) - Key take-aways from the perspective of countries

- ↳ [Conserving the use of Critically Important Antimicrobials in Food-](#)

- Producing Animals
- ↘ State of biofertilizers and organic fertilizers in India
- ↘ Evidence (2004-20) on holistic benefits of organic and natural farming in India
- ↘ DTE cover story on *front-of pack labelling on packaged foods*

MEETINGS, SEMINARS, WEBINARS

- Workshop on *Roadmap to Reduce the Use of CIAs in the Indian Dairy Sector*. 34 pax / 4 female

- Webinar - *Conserving the use of Critically Important Antimicrobials in Food-Producing Animals*. 295 pax / 133 female
- Workshop to discuss the transition towards organic and natural farming (online meeting; in view of the CSE evidence report). 27 pax / 1 female
- Community release of CSE report on evidence on holistic benefits of organic and natural farming (webinar). 320 pax / 87 female
- Webinar series on AMR - the

- 'Development Agenda' (during World Antimicrobial Awareness Week 2021). 192 pax / 66 female
- Webinar series on AMR - the 'Environment Agenda' and the 'Prevention Agenda' (during World Antimicrobial Awareness Week 2021). 158 pax / 86 female
- Webinar series on AMR - the 'Conservation Agenda' (during World Antimicrobial Awareness Week 2021). 135 pax / 39 female

Media Resource Centre and Down To Earth

TRAINING PROGRAMMES

Onsite Trainings

- *Manthan 5* (Nimli, Rajasthan) 21 pax / 3 female

Online Trainings

- *Workshop: African conversation* x1. 24 pax / 13 female
- *Pre COP 26 Online Media Briefing on Climate Change: What is Up for Discussions in Glasgow*. 74 pax / 40 female
- *Northeast Narratives: Online Media Briefing Workshop: Climate Change in India's Northeast*. 49 pax / 18 female
- *Manthan 3: Hindi media workshop* 86 pax / 12 female
- *Manthan 4*. 72 pax / 9 female
- *Training on Data journalism/Air* (Online Course 29 September-12 October, 2021) 84 pax / 44 female
- *Training on Data journalism/water* (Online Course 06-20 August,

- 2021) 54 pax / 28 female
- *Africa media briefing/COVID and water* (Online Course 06-20 August, 2021) 24 pax / 8 female
- *Paid Online data journalism training* (Online Course 07-21 March, 2022) 49 pax / 15 female
- *Training on Data journalism/Air* (Online Course, 06 December 2021-20 February 2022) 65 pax / 33 female
- *Paid Online data journalism training* (Online Course 28 May-12 June, 2021) 67 pax / 30 female

MEETINGS, SEMINARS, WEBINARS

- *Anil Agarwal Dialogue (AAD) consultation: Air pollution in the NCR*. 56 pax / 13 female
- *AAD 2022 (Nimli, Rajasthan 01-04 March, 2022)* 64 pax / 21 female
- *Bolt from the Blue* (Online, 17 July

- 2021) 200 pax / 32 female
- *Book release - The Pandemic Journal* (Online, 08 October 2021) 147 pax / 43 female / 1669 viewed through streaming service
- *Release of State of Environment in Figures* (Webinar 04 June, 2021) 377 pax / 106 female
- *Webinar - Vaccines For All* (Online, 09 July 2021) 200 pax / 50 female

DOWN TO EARTH (DTE) PUBLICATIONS

- State of India's Environment 2022
- State of India's Environment in Figures 2021
- *The Pandemic Journal*
- E-book: *Debates that matter*
- Multimedia: *CSE's YouTube channel*

Sustainable Habitats programme

PUBLICATIONS

- ↘ *Guidance Framework for Better C&D Waste Management* (712 downloads)
- ↘ *Guidelines for Affordable housing in Telangana* (452 downloads)
- ↘ *Towards Affordable and Sustainable Rental Housing* (705 downloads)

- ↘ *Mass housing and liveability: Mapping of the ground reality* (1,060 downloads)
- ↘ *Breathable Indoors* (816 download)
- ↘ *Green Campus Movement* (1,236 downloads)

TRAINING PROGRAMMES

Onsite Trainings:

- Training programme for facility managers of colleges to improve NAAC rating in green features / planning and experience sharing based on CSE's toolkit. 116 pax / 49 females.
- Training on liveability with a deep-

- dive in construction sector (Nimli, Rajasthan 6-9 September, 2021) 28 pax / 3 female
- Training on C&D waste management for SB2.0/ULB funding (Nimli, Rajasthan 08-11 February, 2022) 31 pax / 5 female
- Training for educators on green campus action planning (Nimli, Rajasthan) 49 pax / 15 female
- Training on Self Built Housing on thermal comfort and sustainability (Nimli, Rajasthan 18-21 January, 2022) 23 pax / 4 female

Online Trainings:

- National Faculty Development Programme on addressing liveability in a post-pandemic world (Online Course 14-20 July, 2021) 155 pax / 95 female
- *Online training on New Vastu principles for sustainable building designs (Online Course 17 may-12 June, 2021) 45 pax / 23 female*
- New Vastu Training (Online Course 23 August-12 September,

- 2021) 29 pax / 10 female
- CPWD Officials Training (Online Course 07-08 June, 2021) 66 pax / 4 female
- Online training on city heat action/climate change resilience (Online Course) 310 pax
- Training/Handholding on C&D waste management for Urban local bodies. (Online Course 14-17 December, 2021) 40 pax
- Online training on Strategies for cooling action and operationalizing thermal comfort through self-built housing (Online course 3-4 February, 2021) 187 pax / 113 female
- CPWD officials training (Online course 15-16 July, 2021) 51 pax / 11 female

MEETINGS, SEMINARS WEBINARS

- Meeting on accessibility/liveability paper (Online, 24 June 2021) 247 pax / 115 female
- Webinar to release paper on ventilation and to discuss performance guidelines (Online,

- 20 July 2021) 422 pax / 227 female
- Launch of Green Campus Network plans for implementation to be a green campus (Online, 10 August 2021) 755 pax / 327 females)
- Meeting to launch Telangana Thermal Comfort guidelines (Telangana) 103 pax / 41 female
- Workshop titled 'Advancing Green Educational Campuses – A Regional Experience Sharing' under Green Campus Initiative. 116 pax / 49 females.
- Meeting titled 'Waste to Wealth' for CPWD under Green Campus Initiative. 135 pax / 42 female
- Workshop with stakeholders on the toolkit/heat island data/ citywide heat action plans/coffee table book (Delhi) 78 pax / 33 female
- *Workshop for C&D waste as part of NCAP/air pollution agenda (Nimli, Rajasthan, 15- 18 February 2022) 30 pax*

Environment Education

PUBLICATIONS

- ↳ *Zero-waste Initiative: Action plans of 100+ Forum Schools to become zero-waste (4,272 downloads)*
- ↳ *GSP Primer on Solid Waste Management for Schools*
- ↳ *E-Toolkit on Air Pollution and mobility - English and Hindi*

TRAINING PROGRAMMES

Online trainings:

- Online course on climate change (Dec-Feb, 2022), in collaboration with Sharpener. 55 school students
- *Online course on climate change for school teachers (Jan-Feb 2022). 24 pax.*
- *GSP-Himachal Pradesh Online Capacity Building Workshop-*

District Sirmaur (Online Course, 24-25 November, 2021) 28 pax / 21 female

- *GSP-Himachal Pradesh Online Capacity Building Workshop- District Una- Workshop 2 (Online Course ,1 December-2 December,2021) 28 pax / 16 female*
- *GSP-Himachal Pradesh Online Capacity Building Workshop- District Hamirpur- Workshop 3 (Online Course,16-17 December,2021) 30 pax /21 female*
- *GSP-Himachal Pradesh Online Capacity Building Workshop- District Shimla- Workshop 4 (Online Course, 10-11 January,2022) 22 pax / 12 female*
- *GSP-Himachal Pradesh Online*

- Capacity Building Workshop – District Kullu Workshop -5 (Online Course 24-25 February 2022) 26 pax / 11 female
- *Audit@Home on Energy (Online, July 20 – August 17, 2021) 3170 pax / 1576 female*
- *Audit @ Home: Online household survey for solid waste management, August'21 (3708 student 'waste warriors' completed the survey)*
- *GSP Audit for Schools (November 2021). 549 schools across the country submitted the reports.*

MEETINGS, SEMINARS & WEBINARS

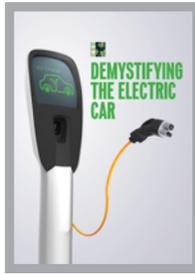
- Online workshop on air pollution and mobility for Jawahar Navodaya Vidyalaya teachers, April'21 (64 teachers attended)

- Formal Launch of GSP Forum of Schools that Segregate, April'21 (450 attended; includes students and teachers)
- Re-convention (Online) of GSP Forum of Schools that Segregate: Workshop on Managing Solid Waste (Online, 02 June 2021) 71 pax / 46 female
- GSP's National Meet on Solid Waste Management in Schools (Online, 15 July 2021) 682 pax / 418 female
- GSP's National Workshop for Teachers on Air Pollution and Mobility (Online, 16 July 2021) 502 pax / 284 female
- Workshop for GSP network schools on introducing solid waste management in the classroom and its pedagogy, August'21 (289 teachers from schools across the country attended)
- GSP Workshop on Air Pollution- Mobility only for Rajasthan teachers (Online, 23 August 2021) 82 pax / 32 female
- GSP's Air Pollution and Mobility Online Quiz (Online, 27-28 August 2021) 189 pax / 112 female
- National Knowledge Conclave 2021: An onsite training at AAETI post- pandemic on The New World Dis(order) from September 23 to 25, 2021.
- 27 educators onsite at AAETI and another 27 online
- Workshop for Sikkim Schools on Plastic Waste Management in collaboration with ENVIS Centre Sikkim, October'21; 71 pax / 41 female
- Air Pollution and ways to celebrate Harith Diwali (Online, 02 November 2021) 920 pax / 429 female
- Why does air pollution get worse in winters: Online briefing for school principals and teachers (November 23 2021) 71 pax / 56 female
- Online teacher's workshop on zero-waste (Online, 22 December 2021) 350 pax / 140 female
- Focus group discussion: A deep dive with Forum Schools (Online, 03 February 2022) 08 pax / 06 female

CSE Publications (2021-22)



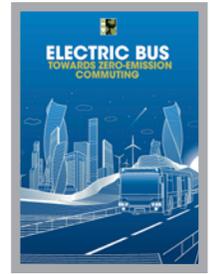
Compendium of Clean Air Action in Africa



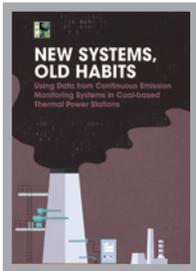
Demystifying the Electric Car



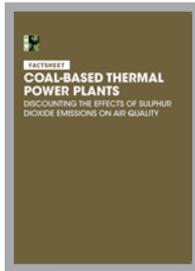
Guidelines for Better Fleet Maintenance



Electric bus: Towards Zero-Emission Commuting



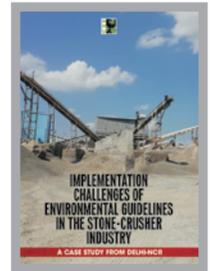
New Systems, Old Habits



Coal-Based Thermal Power Plants: Discounting the Effects of Sulphur Dioxide Emissions on Air Quality?



Norms in Name Alone: Will Coal-Fired Utilities Meet the Deadlines for Emissions Norms



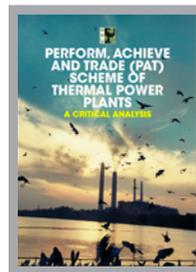
Implementation Challenges of Environmental Guideline in the Stone-Crusher Industry



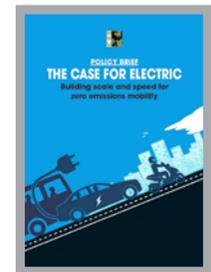
Transparency Index: Rating of pollution control boards on public disclosure



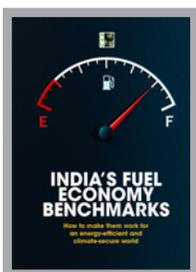
Ghana: Inspection and Audit Manual



Perform Achieve and Trade Scheme of Thermal Power Plants: A Critical Analysis



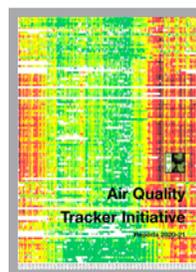
The Case for Electric: Building scale and speed for zero emissions mobility



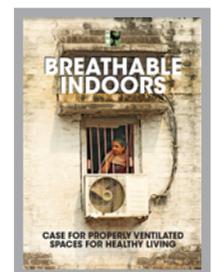
India's Fuel Economy Benchmarks



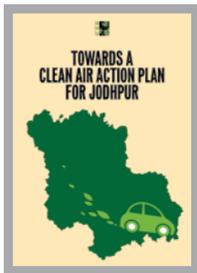
Managing Regional Air Quality: Need for a framework



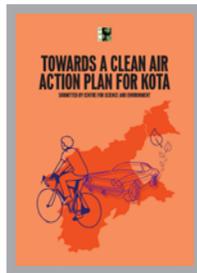
Compendium of Air Quality Tracker Initiative Reports 2020-21



Breathable Indoors



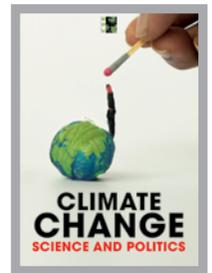
Towards a Clean Air Action Plan for Jodhpur



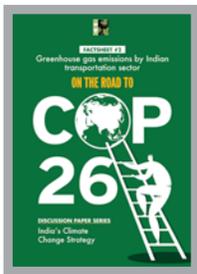
Towards a Clean Air Action Plan for Kota



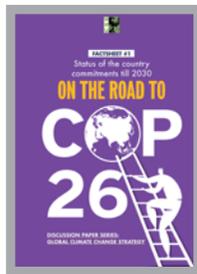
Clean Air Blue Skies: Air pollution during a summer of lockdowns



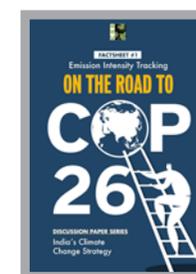
Climate Change: Science and Politics



Greenhouse gas emissions by Indian transportation sector



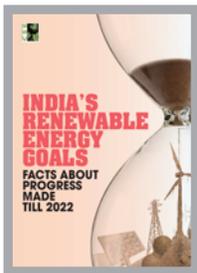
Status of the country commitments till 2030



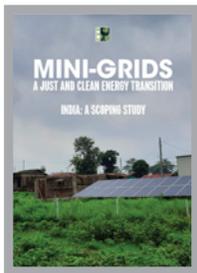
Emission Intensity Tracking



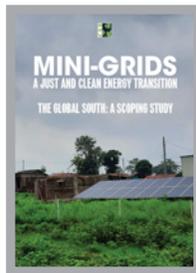
The Numbers Behind Climate Change



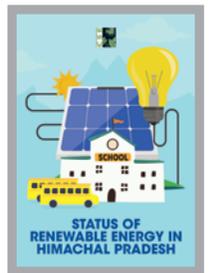
India's Renewable Energy Goals: Facts about progress made till 2022



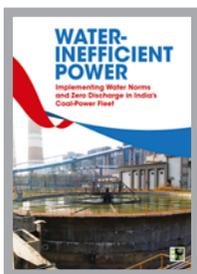
Mini-Grids a Just and Clean Energy Transition (Vol. 1: India scoping study)



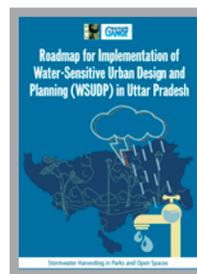
Mini-Grids a Just and Clean Energy Transition (Vol. 2: The Global South)



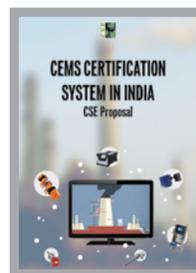
Status of Renewable Energy in Himachal Pradesh



Water inefficient power: Implementing water norms and zero discharge in India's coal-power fleet



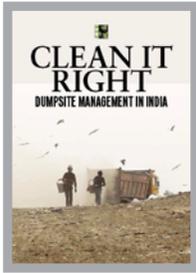
Roadmap for Implementation of Water-Sensitive Urban Design and Planning (WSUDP) in Uttar Pradesh



CEMS Certification Systems in India: CSE proposal



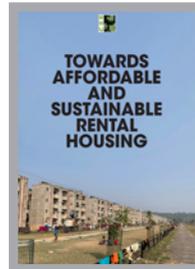
Off the mark



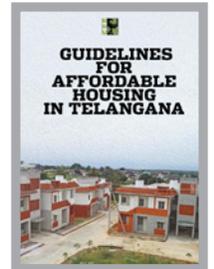
Clean it Right: Dumpsite Management in India



Decentralized Management of Segregated Organic Waste



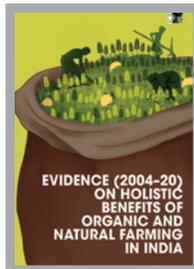
Towards Affordable and Sustainable Rental Housing



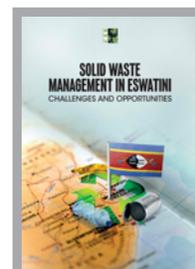
Guidelines for Affordable Housing in Telangana



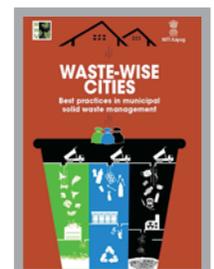
Guidance Framework for Better C&D Waste Management



Evidence (2004-20) on Holistic Benefits of Organic and Natural Farming in India



Solid Waste Management in Eswatini: Challenges and Opportunities



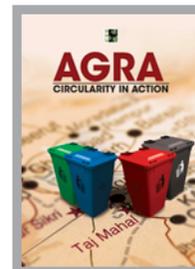
Waste Wise Cities: Best Practices in Municipal Solid Waste Management



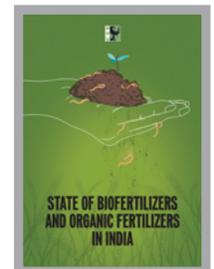
Petha Waste Management in Agra City: An Assessment



Petha Waste Management in Agra City: An Assessment (Hindi)



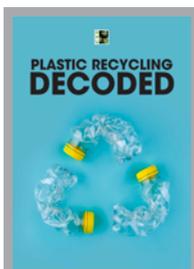
Agra: Circularity in Action



State of Biofertilizers and Organic Fertilizers in India



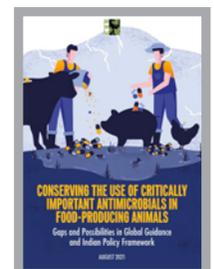
Sanitary Waste Management in India: Challenges and Agenda



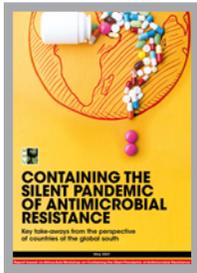
Plastic Recycling Decoded



Toolkit for Legacy Waste Dumpsite Remediation Plan



Conserving the Use of Critically Important Antimicrobials in Food-Producing Animals



Containing the Silent Pandemic of Antimicrobial Resistance



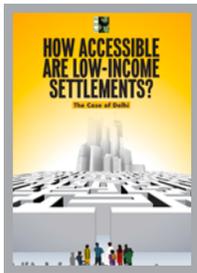
A GSP Primer on Managing Solid Waste in Schools



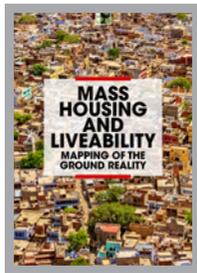
E-Toolkit on Air Pollution and Mobility (English and Hindi editions)



Green Campus Movement



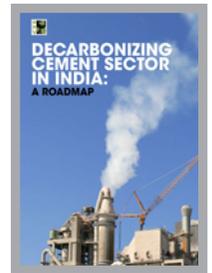
How Accessible are Low-Income Settlements in Delhi?



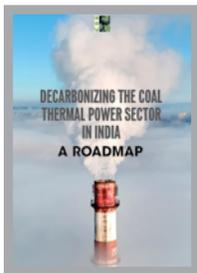
Mass housing and Liveability: Mapping of the Ground Reality



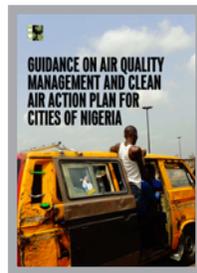
Decarbonizing India's Iron and Steel Sector: Status and Roadmap



Decarbonizing Cement Sector in India: A roadmap



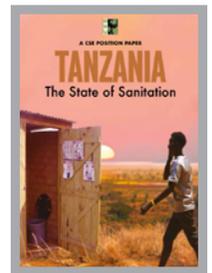
Decarbonizing The Coal Thermal Power Sector In India: A Roadmap



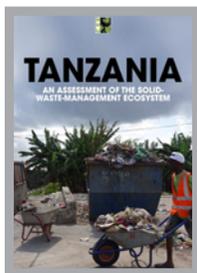
Guidance on Air Quality Management and Clean Air Action Plan for Cities of Nigeria



Tanzania: Policy Strategies to Augment Groundwater through Rainwater Harvesting



Tanzania: The State of Sanitation



Tanzania: An Assessment of the Solid-Waste-Management Ecosystem

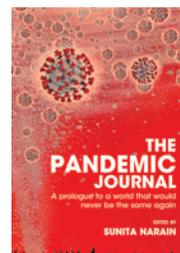
DTE publications



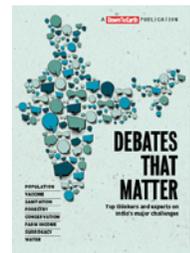
SoE 2022



SoE in Figures 2022



The Pandemic Journal



Debates that Matter

Media presence (April 2021–March 2022)

CSE coverage in Print, Online & Electronic news media

Team	Total no. of media clips	National	Regional	Global/Africa
Clean Air & Sustainable Mobility	1,052	835	143	74
Climate Change	97	72	8	17
Opinion of Cse's staff	202	127	26	49
Environment Education	4	2	2	-
Environment Monitoring Laboratory	3	3	-	-
Impact Assessment	2	-	1	1
Industrial Pollution	162	107	53	2
Media	2	1	1	--
Municipal Solid Waste	65	48	12	5
Renewable Energy	7	5	1	1
Rural Water-Waste Management	3	-	2	1
Sustainable Food Systems	108	91	11	6
Sustainable Habitat	13	9	4	-
Urban Water-Waste Management	58	41	13	4
Miscellaneous	339	226	78	35
Total	2,117	1,567	355	195

News media visibility

There was a significant uptick of CSE's presence in news media, both print, online and electronic (TV) in 2021–22. A total of 2,117 articles and programme segments directly mentioned CSE research, or used CSE staff as sources for stories—up from 1,136 the year before. This included national (1,567) as well as regional, including vernacular language news media coverage (355), and in news media outside India (195 mentions).

Executive board



Raj M.S. Liberhan (Chairperson)

is a management and financial expert, has varied experience, with a significant range of responsibilities at the senior level in government, public sector and NGO environments, building and sustaining organisations, programmes and missions with sector-specific objectives and services. He served as Chief Executive of the India Habitat Centre, New Delhi, for 15 years and helped create a unique institutional mechanism.



M.S. Swaminathan (Emeritus Chairperson)

is one of India's foremost agricultural scientists and is best known as the scientific leader of the 'evergreen revolution movement' in India. His pioneering work in the field of agricultural science and food security has earned him several awards, both national and international, including the Padma Shri, Padma Bhushan, Padma Vibhushan, Ramon Magsaysay Award, World Food Prize and the Tyler Environment Award, to name a few. He has held several distinguished positions, including Director General of the Indian Council of Agricultural Research and of the International Rice Research Institute, and Secretary of the Ministry of Agriculture and Cooperation.



G.N. Gupta (Member)

joined the Board of CSE in 1998 and is among the core group that provides guidance on institutional development issues, particularly on financial issues. As a member of the Indian Revenue Service, he held several key positions in the revenue department of the Ministry of Finance. He served as the Chairman of the Central Board of Direct Taxes, India's highest tax-making body, and also as a Director in the Planning Commission. He currently serves on the Board of several companies and offers consultancy services on issues related to direct taxes.



A.K. Shiva Kumar (Member)

is a development economist and professor. He teaches various courses at Harvard University, Indian School of Business and the Young India Fellowship. He served as the Director of the International Centre for Human Development, New Delhi. In addition to serving as an advisor to UNICEF India, he was a member of India's National Advisory Council. He is a recipient of the MacArthur Fellowship, Mason Fellowship and the Certificate of Excellence in Teaching from Harvard University.



Prof. Ramaswamy Sudarshan (Member)

has had distinguished careers in the domains of research, development programming and governance. He has a Master's degree in Economics from the Delhi School of Economics and a Master's degree in Politics from the University of Oxford. He worked with UNDP from 1991 to 2011. In 2012, he joined the O.P. Jindal Global University as the founding Dean of the Jindal School of Government and Public Policy. He has an impressive track record of publications comprising books, articles and UN policy reports, reflecting his interdisciplinary research, teaching and policy experience in development programmes, human development, law, governance, institutions and policy.



Bharati Chaturvedi (Member)

is an environmentalist and writer. She is the founder and director of Chintan Environmental Research and Action Group. Bharati has served on various committees of the Government of India, including the Expert Committee on Plastic Waste set up by the Ministry of Environment and Forests to finalize rules for plastic waste handling, and a Task Force for social security for the informal sector set up by the Ministry of Labour and Employment. She has also been involved in consultations about the Indian government's Hazardous Waste Strategy and Electronic Waste Rules. Bharati has a Master's degree in history from Delhi University, and a Master's in international public policy from the School of Advanced International Studies at Johns Hopkins University. She is a Leadership in Environment and Development (LEAD) Fellow and has previously received the Sarai Urban Fellowship. She also serves on the board of several non-profit organisations in India.



Sunita Narain (Director General)

has been with the Centre for Science and Environment since 1982. In her years at the Centre she has worked both to analyse and study the relationship between environment and development and to create public consciousness about the need for sustainable development. Her research interests range from global democracy, with a special focus on climate change, to the need for local democracy where she has worked on forest-related resource management and water issues. She serves on the boards of different organisations and on governmental committees and has spoken at many forums across the world on issues of her concern and expertise. Sunita Narain has devoted a great deal of her time to develop the management and financial support systems needed to make CSE strong and sustainable. She has greatly contributed to the institution of management systems that ensure that CSE produces quality work consistently.



Jagdeep Gupta (Treasurer)

is currently the Executive Director, Planning and Operation. She brings a rare and befitting mix of a pure science background with a degree in management, indispensable to understanding the nature of work and the ethos behind an organization like CSE. Over the years she has shown her excellence in acquiring the best talents, developing a wholesome system of monitoring the research outcomes, providing the best infrastructural facilities, developing a wide array of important contacts, and widening the outreach of CSE's research publications. Her forte has been her human management skills, which gives her the edge to handle problem situations with a balanced and unbiased approach. Needless to say, it requires a lot of grit and tenacity to manage so many divergent verticals, which she does with immense ease. She stands as a strong pillar with huge institutional memory and has great contributions to the growth of CSE in many different ways.



Anil Agrawal
(1947–2002)

Centre for Science and Environment (CSE) is a non-governmental, independent policy research institution based in Delhi, which was started in 1980 by the late Anil Agarwal, a leading figure in India's environment movement.

For more than three decades, CSE has helped shape policies and build public awareness to bring change in areas of pollution mitigation and public health security, low-carbon development, natural resource management and livelihood security to make growth sustainable and inclusive.



Centre for Science and Environment

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