CENTRE FOR SCIENCE AND ENVIRONMENT

2022–23

ANNUAL REPORT

Knowledge-Based Activism

CONTENTS

Director's report

Multiple crises needs scale and action

Over the past decades, there is some news to cheer—environment has now become mainstreamed; we are all outraged at how pollution is affecting our health; how climate change is impacting the poor; how deforestation will lead to more poverty and desertification. This is also leading to change — things are getting better in some cases. But the bad news is that we are not acting at a scale commensurate with the devastation that we see around us. Unless we take deliberate steps to reverse the damage, we are losing the battle. This tells us what needs to be done.

The really bad news of course is that climate change impacts are now visible and are devastating lives, particularly of the poorest who in many cases have no option but to migrate to cope with the relentless attacks on crops and livelihoods. We know from our work that displacement because of extreme weather events has now outpaced migration because of war and conflict. In this last year, we have researched and communicated on many trends that should concern us—from the rising fodder shortages that will impinge on people's economies to the question of extinction, as the world loses more and more species to the development race.

But in the last year, we have also found that there is a reason to celebrate — our work stressing the need to reinvent the methods of managing our environment is finding takers. For instance, cities are learning the art of becoming waste wise, learning to segregate at source, to minimise plastics and to reuse and reprocess waste into wealth. We are even taking household waste to manufacture fuel, which then runs buses in cities. Likewise, more and more cities are moving towards off-site non-sewered solutions for excreta management, taking sewage from households to treatment plants that can then recycle and reuse waste. There is evidence that traditional and regenerative farming methods work. These systems are good for soil, water, productivity and farmers. Now we need to ensure that farmers benefit from them, so that good food is not a luxury of the rich, but affordable to all. Then there is a greater demand for community forest rights across the country; women are showing how they can manage forests for livelihoods, so that the country can build a wood-based economy.

The important point to realise is that change is visible. The very method of managing the environment has been re-engineered, so that there is an alternative pathway to growth or to minimise the adverse impact of growth. It is also a lesson to remember, as the country reviews strategies for new energy systems, like renewables or introduction of electric vehicles (e-vehicles). The fact is that in both the cases, the progress is sputtering and not accelerating because we are doing nothing with the deliberateness that the issues require. For instance, e-vehicles still constitute a mere three per cent of the new vehicles registered in India. And though solar and wind installations are growing, energy poverty is still a hurtful reality. Energy transformation will need to be just and equitable to be affordable to the poorest.

The bottom line is that environmentalism and our work at CSE will need to keep pushing the envelope of change, even harder. It will need to track and report, so that the truth is not hidden and at the same time, has the courage to stand behind solutions. Environmentalism is about the deepening of democracy not a techno-fix.

(Sunita Narain)

Programme monitoring

SNAPSHOT

In 2022-23, CSE conducted a total of 108 events (online and in-person) engaging 11,321 stakeholders of which 41 per cent were females. A total of 143 capacity building workshops were conducted, of which 38per cent were online workshops, reaching 6,891 participants (encouragingly, 40per cent were female participants).

Advocacy and research productivity

Advocacy and research productivity was high this year too, as CSE's research and programme teams produced a total of 92 publications in the year, ranging from research-based studies to policy briefings, technical reports, guidelines, practitioner's handbooks, best practice documentation and training manuals, among other formats.

Capacity building

This remains an important intervention strategy for CSE, and was significantly scaled up. In 2022-23, a total of 143 training courses and capacity building events were conducted, capacitating 6,891 participants, of which approx. 40 per cent were female participants. Onsite / in-person trainings (88 nos., for 2,840 participants) were mostly conducted at the Anil Agarwal Environment Training Institute (AAETI), CSE's learning and teaching facility located near Delhi in Neemli, Rajasthan. Online engagements have become routine –55 trainings (38 per cent of all trainings in the year) were conducted online, for 4,051 persons, of which close to 35 per cent were women.

Event participants (2022-23)

Meetings/ webinars / conferences

108	11,321	41%
Nos. Conducted	Total Participants	Female Percentage

Capacity building trainings

143	6,891	40%
Nos. Conducted	Total Participants	Female Percentage

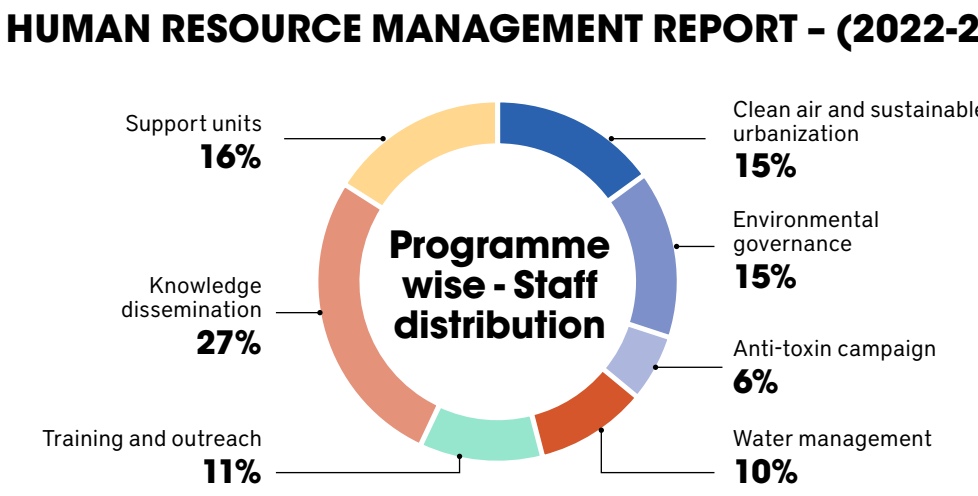
News media visibility

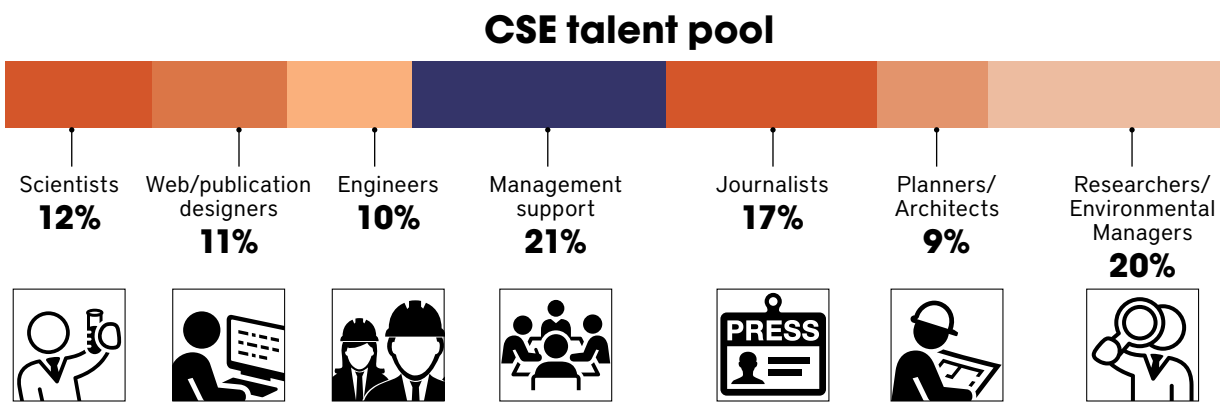
CSE's media presence (mentions in print, online and electronic (TV) platforms of CSE research, or CSE staff used as sources for stories) has improved. Compared to last year when CSE was mentioned 2,177 times in media clips, in 2022–23 appeared in 2,336 clips (an increase of more than 7 per cent). This includes CSE research or advocacy mentions in national (1,688), regional/sub national/ regional language media (290) and international (358) media coverage. Importantly, *international coverage has almost doubled from last year, up from 195 to 358 media mentions, an increase of 84 per cent.*

See annex for details

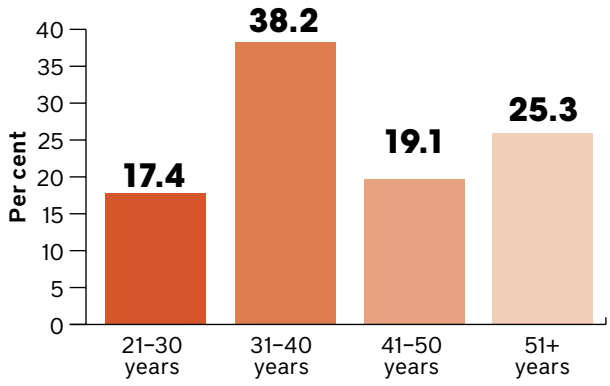
Human resource management report (2022–23)

CSE staff: A profile



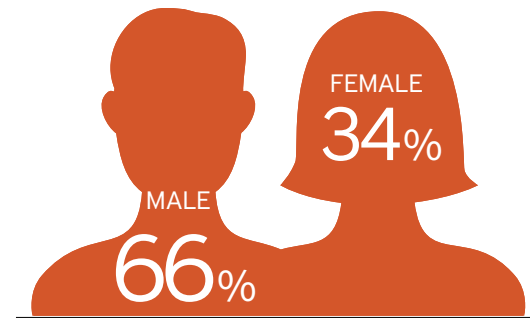


CSE is a young organisation



Gender ratio

(2022–23)



CSE is a young organization. 56% of the staff is below the age of 40 years of age

Interns and volunteers

About 50 interns and volunteers from across India and several international students were involved with CSE research, advocacy and support services and outreach programmes in 2022-23. While a majority of the interns and volunteers worked onsite and in-person with CSE teams, several interns from international universities engaged online. Some interns were also onboarded as permanent employees.

As with the previous years, interns continue to make significant contributions in terms of completing specific and assigned research outputs, contributing stories and articles and blogs to Down To Earth and in the Young Environmentalist web portal, assisting programme support teams in maintaining and building database, and providing assistance in organising events and training programmes, among a host of other important tasks.

CSE received numerous internship requests from Universities of repute in India and abroad, including Manchester University, UK; University of East Anglia; University of Nottingham, UK; University of Melbourne, Australia; Princeton University, USA; and from Indian Institute of Technology (IITs), the National Institute of Technology (NITs), School of Planning and Architecture; National Law Schools; and Central Universities such as Banaras Hindu University, Delhi Technological University, Tata Institute of Social Sciences, among others.

CLEAN AIR AND SUSTAINABLE MOBILITY PROGRAMME

To reduce the energy intensity from transportation and travel practices, with climate, health and equity co-benefits

INDIA PROGRAMME

TO ADVANCE and influence our existing policy targets on improving air quality and sustainable mobility we have worked on four fronts – (a) Strengthening NCAP targets and action to meet the targets in Odisha, West Bengal and Rajasthan; (b) Promoting public transport and mobility for clean and low carbon mobility; (c) Scaling up electric mobility ecosystem and improving electric vehicles and battery technology; (d) Promoting South-South clean air action with special focus on transport in Africa. The strategy has been policy analysis for knowledge support and advocacy, and capacity building for implementation.

National Clean Air Plan (NCAP)

After helping states prepare their clean air action plans, there is much stronger buy-in and demand from the concerned departments to provide knowledge and capacity building support for specific implementation strategies. These include ULB-level plans and strategy development for implementation in the Kolkata Metropolitan Area (KMA) region with 41 ULBs; scaling up beyond cities to include state-wide action strategy in Odisha and Rajasthan; and supporting the next generation clean air policy for

Delhi-NCR. This has opened up opportunities to engage more deeply with departments to directly influence and design strategies for implementation. CSE was nominated as a member of the steering committee to review and frame national ambient air quality standards (NAAQS). CSE is providing technical inputs to help bring stringency in the national clean air standards.

Real Driving Emission (RDE) regulations

On vehicle emissions, and in line with CSE's push to regulate real-world driving emissions, Real Driving Emission (RDE) regulations will be implemented from April 2023 onwards. Several of CSE's specific recommendations have been incorporated, including tightening conformity factor norms, defining RDE tests, after-market measurements of on-road emissions, among other measures. CSE has succeeded in getting this included in the clean air action plans of non-attainment cities of West Bengal and Odisha under NCAP. The programme convened national and international workshops to provide knowledge support and assistance on strategy development on the issue of on-road emissions management, including organising workshops and exposure visits to demonstration projects on RSD to understand how to go beyond pollution under control, PUC certificate, regime.

Sub-national efforts

CSE has been invited as an expert member on a committee formed by the government of West Bengal following the NGT order to prepare the Air Quality Plan for the Kolkata Metropolitan Area (KMA). CSE's inputs into the regional air quality management plan for KMA, based on the assessment of sectoral status of 41 ULBs, has been accepted by the committee, and a series of capacity building events were conducted by CSE for 41 urban local bodies to address the strategies that fall within their direct jurisdiction, including C&D waste, non-motorised transport, and parking, among others. The Urban Development Department of the Govt of West Bengal has issued directives to the ULBs to implement parking, C&D waste management and on making reuse of C&D waste obligatory. CSE is also part of the core group of the Department of Environment formed to revise the Climate Action Plan 2021-30. In Odisha, the state pollution control board has sought CSE's knowledge support to prepare a comprehensive state clean air action plan and capacitate various line departments on multi sectoral strategies. This has been submitted and CSE will provide knowledge and strategy support for implementation.

Public transport and e-mobility

In the past few years, the programme has engaged with 17 state transport corporations on operational and fiscal strategies for bus operations. As part of this initiative, CSE collaborates with state transport undertakings of Navi Mumbai, Bhubaneswar, and Shimla to develop operational plans for electric buses. Odisha has involved CSE in framing the e-mobility strategy for the Bhubaneshwar region, with focus on assistance to improve their bus services, to improve ridership and integrate the planning for electric buses. As part of the push for electrification of shared e-mobility and informal public transport (IPT), the government of Odisha has taken on board CSE's recommendations on the electrification of autos as part of last-mile connectivity for buses in the cities of Bhubaneshwar, Cuttack and Puri. Following CSE's review of gaps in the current bus operations in Navi Mumbai, CSE has been invited to conduct a detailed analysis of operational data to help improve their service and rationalise route planning for electric buses. This is in progress and will be taken forward next year.

Zero Emission Vehicle (ZEV) mandate

As part of its initiative to influence India's strategy for low-carbon roadmap, CSE's report and

consultations brought together Niti Aayog, the automobile industry and key experts to help inform and influence Niti Aayog's initiative to frame the low-carbon transport initiatives and targets for 2024 to achieve the INDC goals. This includes developing a strategy for accelerated electrificaton of fleet by 2030, help place India's EV policy on globally benchmarked practices, fiscal and non-fiscal support, infrastructure development, financing strategy, industry makeover, and market development to build ambition.

Battery technology roadmap

Following the publication of the EV position paper and battery fire safety article, CSE was approached by the Department of Science and Technology (DST) to lead a white paper on the development of tropical EV battery to enable battery technology which provides performance as well as safety considering Indian climatic conditions and materials. This has opened up a new opportunity to contribute to the roadmap of advanced battery technology which is critical to support localisation of EVs and technology roadmap.

GLOBAL PROGRAMME

THERE IS a much stronger buy-in and specific demand from the ministries in Nigeria (such as FMoT, NADDC, NGMC and DRTS) to provide knowledge support and best practice sharing opportunities for urban transport policy, electric mobility, vehicle technology roadmap and clean air action plans. We could also get agreement from the inter-governmental pan-Africa forums like the East African Community (EAC) to develop a platform for some of the engagement on our issues to make it scalable. The AAETI trainings have supported these initiatives and brought together 183 officials from the concerned departments and helped expand our regulators network to influence implementation.

In **Nigeria,** there was good progress on the 'clean air action plan' and 'emissions standard roadmap' initiatives. CSE's intervention will lead to a national clean air action plan which is expected to go to the National Assembly for finalisation and adoption. The key areas of interventions include i) Air quality monitoring strategy and implementation of clean air action plan ii) On clean fuels and clean vehicle technology roadmap, including CNG and vehicle electrification programme. As the nodal Ministry for air quality management in Nigeria, the Federal Ministry of Environment (FME) has convened a multi-stakeholder forum comprising relevant stakeholder ministries, departments and agencies. FME has invited CSE's inputs on knowledge sharing, implementation strategy and capacity building support on the clean air action plan. These and related efforts will be taken forward in the coming period—including inputs on drafting national urban transport policy, NUTP, and the push for clean fuels, including CNG and electric vehicles—with national Automative Design and Development Council, NADDC.

In **Ethiopia**, CSE's knowledge support and guidance framework has been incorporated into the country's national air quality management roadmap.

At the **pan Africa** level, CSE's regional consultation on transforming transportation and mobility for clean air convened close to 40 officials from several countries in Dar es Salaam, including the East African Community (EAC). It is clear that there is much interest in South-South perspectives on strategy development and on experience sharing on policy making. Similarly, a workshop and exposure visit on clean air action planning strategies for seven African regulators from Kenya, Uganda, Zambia, Zimbabwe, Malawi and Mozambique showcased initiatives in India.

URBAN WATER-WASTE PROGRAMME

Build institutional and technical capacities, handholding implementation of demonstration projects, and leverage policy opportunities to upscale sustainable water, sanitation and faecal sludge

INDIA PROGRAMME

IN INDIA, 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 in Uttar Pradesh, India's largest and most populous state. CSE has signed an MoU with the Uttar Pradesh state government to work in the areas of inclusive sanitation, including FSSM. The programme has developed key partnerships at the national and at the state level, 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 (KYC) of the Government of India's flagship programme, 'National Mission on Clean Ganga' (NMCG).

FSSM in Uttar Pradesh

CSE's technical assistance for FSM in Ganga Basin towns under NMCG is designed to support UP State Department of Urban Development (DoUD) to scale up FSM across small and medium towns. CSE successfully demonstrated the implementation of Fecal Sludge Treatment Plant (FSTP) and co-treatment in two towns (10 KLD FSTP in Chunar and a 20 KLD co-treatment plant in Bijnor); and facilitated the implementation of relevant national-level programmes in the state, including AMRUT 2.0 (i.e. national mission for used water management for 500 big cities), Swachh Bharat Mission 2.0 (i.e. clean India mission for used water management in small and medium towns not covered under AMRUT) and NMCG. 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 key development this year was that the state government requested CSE to provide both technical assistance as well as policy and program guidance for FSM in UP. This was demonstrated in the commitment expressed on March 22, 2022 in the presence of the Minister and the Chief Secretary of the state for FSM as an inclusive sanitation service provision priority for the state. They requested for a CSE team to be stationed in UP and work closely with the Department of Urban Development (an MoU with CSE was signed for this in August 2022).

The initiative with NMCG was significantly scaled up for training government officials and other water sector experts. A total of 2,703 participants were trained under this initiative, of which more than 950 were government officials in the water and sanitation sector. A total of six significant research publications were published in the year:

- Handbook for planning and designing water sensitive cities for Ganga
- Urban stormwater management – potential and challenges
- Urban Lake Management
- Decentralised wastewater management – practitioners guide
- Water sensitive cities index: Handbook
- Assessment of co-treatment potential in Ganga Basin towns of Uttar Pradesh

State-level engagements in Uttar Pradesh

- MoUs with the national-and state-level missions secured the mandate for CSE to strengthen capacities of key decision and implementation agencies (Urban Local Bodies, Jal Nigam (Water/ Sewerage Boards), state officials) on decentralised and non-sewered sanitation systems and promote the paradigm of water-sensitive cities.
- CSE monitored the construction of 62 faecal sludge and septage management (40 FSTPs and 22 co-treatment facilities in STPs) and published a report on Assessment of FSTPs and Co-treatment units in UP. About 40 plants are infrastructure-ready and 3 plants are fully operational.
- Fewer than 10 per cent of the 762 ULBs in Uttar Pradesh have centralised sanitation systems. As of end-2022, UP had planned FSM in 59 towns. The state has planned for an additional 139 towns to have Interception and Drainage (I&D) treatment systems under the Government of India's SBM-Urban 2.0 program. CSE will assist authorities in ensuring the sustainability, inclusiveness and equity in the deployment of this new infrastructure
- CSE has a wide canvas of action as part of its collaboration with NMCG—from directly assessing infrastructure of FSM and co-treatment in two towns, to ensuring the state and towns follow water-sensitive cities approach. CSE has produced a set of six learning collaterals(reports) for NMCG in 2022–23 and trained city officials of UP and other states.
- The CSE team supported the World Bank's Performance Based Incentive Grant (PBIG) programme for upgrading FSM in Ganga Basin towns.
- A total of 420 officials from UP were capacitated by CSE training programmes; a total of three state and national level workshops were conducted—covering the topics of citywide inclusive and responsible sanitation services; bye-laws and economics of desludging services, among others.
- 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 and 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 UP state

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. In Bijnor, the

National Mission on Clean Ganga (NMCG) approved the first pilot for a FSSM co-treatment sewage treatment plant (STP) facility as a model / pilot. The programme also provided close handholding support to Bijnor city authorities—from conducting regular city sanitation task force meetings, designing IEC campaigns, creating sanitation cells, developing model containment systems, preparing teaching and learning resources, entering into MoUs with nearby ULBs for cluster-based approach, among other tasks. Bye-laws have been formulated for citywide sanitation and a gazette notification has been issued. A model decentralised waste water treatment plant is under construction in Bijnor.

In Chunar, the other 'deep dive' city for the programme, CSE had been working intensively with state and city authorities to plan, design and set the operational parameters of a FSTP, which was fully commissioned in 2022, and is now showcased by the state government as a model FSTP. Bye-laws have been formulated for citywide sanitation and are in the process of gazette notification.

For cities without any FSSM plants, and based on the request of UP state Department of Urban Development, CSE's Guidelines for Implementation of Deep Row Entrenchment (DRE) in towns with < 20,000 population in Uttar Pradesh for achieving ODF++ was issued by SMB 2.0 and online trainings were organised by Swacch Bharat Mission (SBM) in collaboration with CSE for 240 ULBs with population <20,000.

Capacity building hub on urban sanitation in India

CSE today, is widely acknowledged as a national-level capacity building hub on sustainable water management, sanitation and faecal sludge management. In 2022-23, a total of eight online and 13 residential trainings were conducted for 1200+ participants, with focus on mainstreaming citywide water and sanitation management, water-sensitive urban designing and planning, groundwater, water efficiency and conservation and rainwater harvesting. Two exposure visits to show the best practices in Odisha and Tamil Nadu were conducted for 36 municipal officials. Five webinars were conducted in this period for approx. 1,000 participants drawn from India, South Asia and Africa.

Trainings ranged from technical workshops on decentralised wastewater management, ground water management to an online course on WSUDP, decentralised wastewater management, 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 and C-GINS (a web-based compendium of case studies on GI, showcasing good practices).

Outreach

The programme remained active and engaged with its community of peers, with a bi-monthly e-newsletter, regular postings on platforms such as Water Digest, SuSaNa, NFSSM Alliance, IWA etc. and is also active on social media channels including Twitter, Facebook, LinkedIn and WhatsApp groups. Several blogs and several articles were also published in Down To Earth in this period. CSE organised a series of event, articles and publications during this period. New case studies were uploaded on MOUNT 2, an aggregator platform for technologies and solutions for non-sewered areas and C-Gins.

GLOBAL PROGRAMME

THE PROGRAMME'S key engagement areas in the Global South—Africa, South Asia and some Caribbean countries in 2022-23—span the areas of city-wide sanitation (CWS), faecal sludge and

septage management (FSSM), building capacities of sanitation planners on deploying 'shit flow diagrams' (SFDs); and advocacy on a Global South water-sensitive approach to urban planning.

CSE's SFD work in Africa and Caribbean countries

CSE has deep-dive commitments in South Africa and the Caribbean countries where it engages to institutionalise SFD, CWS and FSSM. In 2022-23, CSE conducted four workshops, and four trainings on SFDs—how to deploy and use this sanitation planning tool to mainstreaming FSSM, engaging with more than 200 practitioners and sector experts from Africa, South Asia and the Caribbean.

A series of online trainings were conducted by CSE in collaboration with the Global Water Partnership-Caribbean (GWP-C), GEF CReW+, UNEP Caribbean Environment Programme, Cartagena Convention Secretariat, and Caribbean WaterNet (Cap-Net). It is clear that Caribbean countries are interested in deploying this tool—SFDs were prepared and published on the SuSanA platform—Mahdia town, St Mary, George Town, ST Lucia and Hanover.

A detailed study with an SFD 'lite' report on Mwanza town in Tanzania was used in the ongoing pollution assessment studies being conducted by CSE on Lake Victoria. The report also gave recommendations for improvement in sanitation systems and best practices that could be employed in the city. The outputs of the report were used in writing a pollution abatement plan for Lake Victoria, Tanzania.

In South Africa, CSE worked closely with its country partners, Water Research Commission (WRC) and the Department of Water and Sanitation (DWS) to conduct a series of SFD trainings for participants from South Africa, including 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; they will also serve 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 130 practitioners from South Africa on how to prepare SFD, and how to conduct training programmes on preparation of SFDs.

Water-sensitive urban design and planning (WSUDP)

CSE engaged in developing perspective on a Global South Water Sensitive Cities approach, moving up from a normative WSUDP understanding. The framework for Water Sensitive Cities was an outcome of this serious engagement. It takes forward the work done by CSE in urban water and provides an opportunity for a larger Global South urban water perspective and engagement potential, through updating our existing learning collaterals of WSUDP, identifying new research areas (in informal settlements as well as city wide perspective of water and waste water management).

Global South initiatives

An online consultation workshop helped initiate engagement with key water sector players and practitioners in the Global South. The workshop explored opportunities for developing regional partnerships and collaborative research, capacity building or policy initiatives for sustainable water and waste water management. Participants from Nepal, Bangladesh, Uganda, Tanzania, Zambia, South Africa participated in the workshop. CSE also showcased Global South perspectives on decentralised sanitation access, particularly for non-sewered areas, on global platforms including the International Water Association's World Water Congress and Exhibition in Copenhagen, and in FSM 7 (Abidjan), where CSE presented its ongoing efforts in Uttar Pradesh.

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

INDIA PROGRAMME

AT THE national level, the team engaged with different states to capacitate officials from the government's engineering departments on the safe management of wastewater and faecal sludge. A total of 150 government officials have participated in CSE trainings on wastewater and faecal sludge management.

CSE has been designated by Department of Drinking Water and Sanitation, Ministry of Jal Shakti as key resource centre to capacitate the government officials on the Government's flagship programme, Jal Jeevan Mission. Last year, the team has capacitated 152 government engineers on source sustainability and management of greywater in the rural areas.

GLOBAL PROGRAMME

THE PRIORITY of the Rural Water-Waste Team for the year 2022-23 was to work closely with the government agencies of the Global South in order to bring changes in policies and strategies and programmes related to safe and sustainable source for water. For this, the team worked closely with the Department of Drinking of Water and Sanitation, Ministry of Jal Shakti, Govt. of India, and also water and sanitation related ministries in Tanzania (Ministry of Health), Uganda (Ministry of Water and Environment), and Nigeria (Federal Ministry of Environment), CSE's formal partners in Africa.

CSE has upped the scale of its capacity building efforts in the areas of source sustainability, groundwater recharge and management of wastewater and faecal sludge management in rural areas. In 2022-2023 alone, 472 participants across the Global South attended CSE trainings on groundwater, faecal sludge and greywater management; out of these, 405 are government officials from India, Uganda, Nigeria and Tanzania.

Following the recent five-year MoU with the Ministry of Health, CSE received the Ministry's formal request for assistance in improving Tanzania's policies and implementation strategies for groundwater recharge and sanitation. An orientation workshop at Dar Es Salaam for officials from these countries was followed by an exposure visit for senior government officials to India to see implemented projects on groundwater and wastewater treatment and reuse in rural areas.

Meanwhile, as a follow-up to previous collaborative efforts with CSE, the Ministry of Water and Environment, Uganda, has finalised specific institutional sites (rural schools with high footfalls) to implement groundwater recharge and wastewater projects in Wakiso and Kayunga districts, which CSE will handhold. The projects will be upscaled and these will result in the creation of legislation for water and wastewater management at the institutional level. A TOR was also developed for a health centre at Kayunga district for the implementation of a decentralised wastewater management project, to which CSE provided handholding support.

Federal Ministry of Environment, Nigeria, has expressed interest in working closely with CSE to upscale their existing policies on groundwater management and toilet waste management in rural areas. Specific initiatives will be taken up in 2023-24.

Representatives from Uganda and Nigeria are both interested in implementing model projects on wastewater management and groundwater recharge in rural areas, suitable legislation and regulation will be designed around these working models.

Big change is possible:
Best practices on water supply and sanitation in India

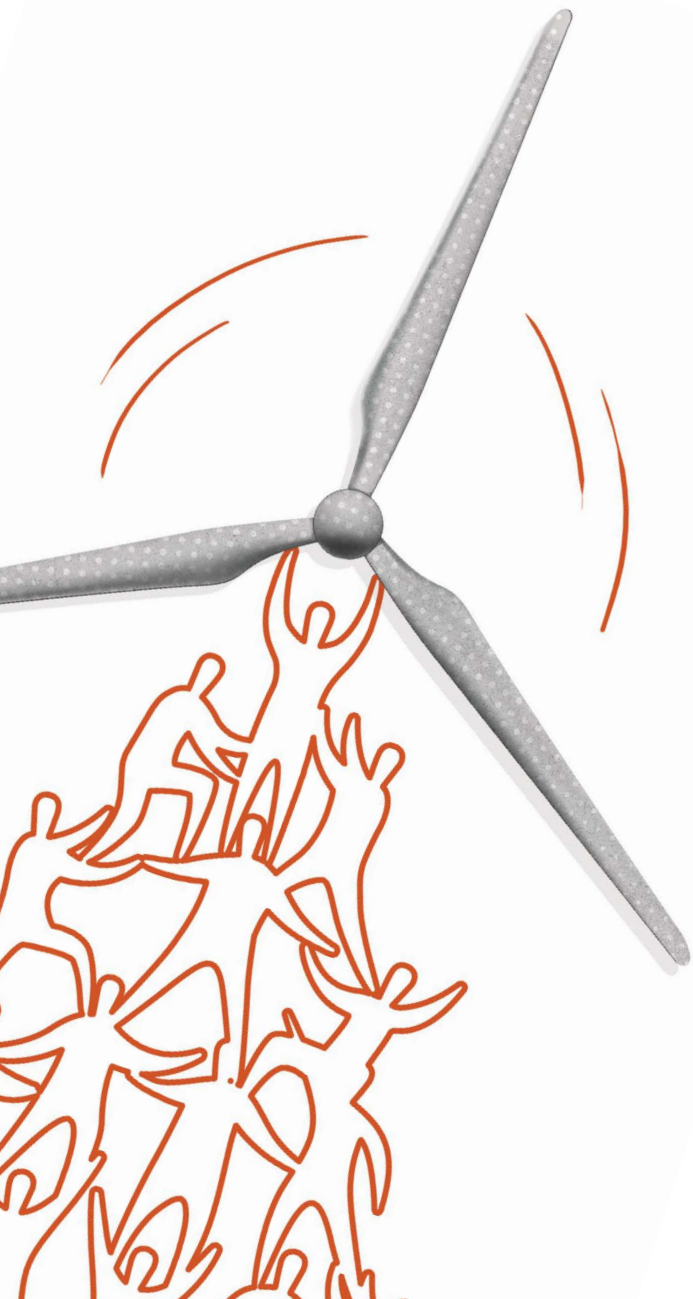
This compendium comprises success stories of managing water supply, grey water and faecal sludge in rural India under different government programmes.

CSE travelled to different ecological regions of India to document best practices of source sustainability, greywater and faecal sludge management. The 64 case studies illustrate the substantial on-ground impact—including reduced expenditure on health and improved quality of life, especially for women and girls—of implementing projects to treat water, grey water and faecal sludge. The first section is on source sustainability, showing the importance of site selection in accordance with local geology.

Another section analyses how villages that once grappled with water stagnation, mosquitoes and overflow from open drains tackled their problems by managing grey water at the household, community and village levels. A third section shows how villages used different toilets for site-specific solutions as well as economic and institutional structures for offsite treatment of faecal sludge.

RENEWABLE ENERGY PROGRAMME

Combines the energy access agenda (traditionally associated with conventional energy) with the renewable energy agenda (that has environmental benefits) to help catalyse a transition to clean energy



INDIA PROGRAMME

CSE IS currently exploring the potential of mini-grids in addressing electricity demand displacement and their role as tail-end generators integrated within the grid. During Cop26 in Glawglow, India made a commitment to achieve a 50 per cent non-fossil energy share and install 500 gigawatts of renewable energy capacity by 2030. Mini-grids have emerged as a promising pathway to fulfill this commitment.

Despite significant efforts to expand the grid infrastructure, many parts of India still experience uncertain and limited electricity supply. In such areas, mini-grids have become indispensable in providing energy for lighting and supporting small businesses, particularly in rural regions. By generating power at the point of consumption, mini-grids effectively manage household and commercial electricity demand.

Mini grids for a just and clean energy transition

Mini grids can address the issue of universal electricity access for households which is embedded in the 7th Goal of the 17 SDGs. The reports (Vol. 1 and Vol. 2) and stakeholder consultations in India and subsequently in Africa and Asia provide a birds-eye-view of the landscape, including policy and regulatory analysis to identify opportunities as well as gaps in government schemes that are hindering the upscaling of clean energy access initiatives; engage with the private sector on DRE-based skills development; identify menu of technological choices; and generate wide awareness on existing schemes to improve participation and initiate broad outreach to build a public agenda for change.

A public webinar was in May 2022 convened active promoters and practitioners of mini-grids in Africa, with active participation from leading private and public sector practitioners, including Power for All, Husk Power Systems, ARC Power, Kigali, ENGIE Energy Access, Equatorial Power Ltd., and ESMAP World Bank, Washington DC. A number of topics were discussed during the webinar, including the Small Power Producer Framework of Tanzania and its retail tariff structure, the Results-based Financing (RBF) of Rwanda, the Interconnected Mini-Grid Acceleration Scheme of Nigeria, and the Bundled Approach to Mini-Grid Tendering of Uganda.

The programme also helped build capacities on solar-based mini-grid systems, with the objective to assess challenges and opportunities, techno-economic feasibility and financial viability of setting up solar mini-grid systems. Faculty was drawn from leading practitioners in India. A total of 43 participants attended the course.

State interventions

The programme engaged with the states of UP, Chhattisgarh, and Jharkhand on the role of mini-grids in improving energy access in these states. CSE mapped the emerging issues in these states, with focus on the PM-Kusum scheme, solarisation of unelectrified villages, and rooftop solar policies, among others. A specific workplan and state-level intervention strategy will be finalised this year.

Policy watchdog role: Repowering wind, demand aggregation

The programme plays an important watchdog role and keeps track on the implementation of RE projects through targeted analysis, articles, policy response pieces, commentary and stakeholder meetings. This is a large mandate, given the scale of installations—large energy systems to mini grids and standalone devices, varying geographies, state policies and support systems—each factor carries particular implementation risks. Also, given the outsized role of private sector in energy in the country, it is crucial for independent organisations to keep a close eye on developments, especially as any big development here has consequences for the energy poor. Harnessing wind energy for grid application is a challenge, given its intermittent nature and the limited number of favourable sites. There is considerable interest therefore in 'repowering' older wind farms to accelerate capacity addition. Despite the August 2016 wind repowering policy of the Ministry of New and Renewable Energy, CSE's study and a Right to Information (RTI) query addressed to the Indian Renewable Energy Development Agency (IREDA), revealed that not a single project has availed rebates for wind repowering. In view of the 6–7 per cent growth in the demand for electricity in India and the country's ambitious NDC commitments (50 per cent of installed capacity for power generation to comprise of non-fossil fuel-based energy sources), it is clear that there is urgent need to accelerate the growth of wind and other renewable energy sources. With a 7,500 km coastline, India is well suited for the development of offshore wind energy. CSE's technical report explores how India can best utilise its offshore wind energy potential.

CSE's ongoing research on 'demand aggregation' covers the challenges of the slow development of the solar PV sector, despite encouraging policy and finance and an ambitious target of 40 GW from Rooftop Solar PV projects. The low offtake of rooftop solar PV projects makes recognising advanced working market models necessary to accelerate the uptake. Utility-based demand aggregation is one of the models in which the utility combines the rooftop interests in its area of work and decides on the project developer for the installation of the rooftop solar PV in the aggregated terrace space of the designated end-users. This work will continue in

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.

the coming period.

Media visibility was high for the programme, with extensive coverage of webinars and publications appearing in prestigious national and international news media, including in CNN, Times of India, Hindustan Times, Mongabay (Hindi), Citizen Matters, ZDF, The Third Pole, Eco-business, The world, Moneycontrol, Business Standard, The Print, Scroll, Fact Checker, Jara News, among others.

GLOBAL PROGRAMME

IN 2022-23, progress on the global component of the programme was slow, due primarily to transition delays caused by changes in programme leadership.

In May 2022, CSE's scoping paper, Mini-Grids a Just and Clean Energy Transition (Vol. 2: The Global South) followed by the convening of sector experts and practitioners from Africa and South and Southeast Asia, contained important lessons , for example, the need for a strong legislative framework (as in Sub-Saharan Africa) to catalyse rural electrification, attracted private investors, and boost the solar hybrid mini-grid sector.

In continuation of our mini-grid programme, in 2022-23, the RE programme expanded efforts to Nepal and Bangladesh. The programme specifically emphasises the exploration of larger-scale productive uses of energy, as well as the development of tariff mechanisms and subsidies models for community and cooperative-owned mini-grids.

The programme is designed to empower local communities, foster economic growth, and promote energy self-sufficiency. By leveraging the potential of larger-scale productive uses of energy and implementing effective tariff mechanisms and subsidies models, it is designed to create an enabling environment for the successful deployment and operation of community and cooperative-owned mini-grids in Nepal and Bangladesh.

CSE is currently conducting research on the potential utilisation of compressed biogas in Africa and South Asia, with a specific focus on rural areas that have substantial agricultural sectors. CSE is working on a scoping paper to explore this topic further. One of the primary areas of interest is the use of crop residues, particularly those from cereals, as a feedstock for compressed biogas production. This renewable energy source has shown significant promise in providing clean and sustainable energy for rural communities.

CLIMATE CHANGE PROGRAMME

Pushes for low carbon growth pathways and mainstreams climate co-benefits with the goal to build a climate resilient society in India and to push an ambitious climate deal in global negotiations, based on equity, fairness and historical responsibility

THE CLIMATE CHANGE Programme is committed to championing the study of the most pressing climate issues relevant to the Global South. CSE's publications on climate-critical topics, its presence at UNFCCC proceedings such as COP summits and Subsidiary Body meetings, public outreach and advocacy, media engagement, and training programmes are designed to create multipliers in society for climate action. In 2022-23, the Climate Change programme advanced its research and advocacy along three broad themes: 1) climate ambition and UNFCCC negotiations, 2) forest-based carbon sinks, and 3) global methane emissions.

The programme produced a research report on forest-based mitigation, factsheets for COP 27, a factsheet on methane emissions, and two Down to Earth cover stories on loss and damage, and climate and trade. Our work on loss and damage, and climate and trade was widely recognised, and the programme is frequently sought out by media to comment on the latest issues.

The programme also conducted two online training programmes which were very successful, and received strong and positive feedback.

Presence at COP-27

Prior to COP 27, the programme produced a set of factsheets on major themes, and a Down to Earth cover story on the headline issue of loss and damage. Three webinars were conducted—1) on loss and damage with global experts, 2) a media briefing, and 3) launch of the Extreme Weather 2022 report by Down to Earth.

CSE and Down to Earth took a delegation of six to COP 27 in Sharm el Sheikh, Egypt from November 6 to 18, 2022. The programme reported extensively from the COP 27 proceedings, met with climate negotiators and key political figures, observed negotiations, and attended side events. On many occasions, we were the only Indian NGO in the room observing negotiations, which are the crucial core of the UNFCCC multilateral process.

A daily article summarising the days' proceedings was widely disseminated, as well as approx. 30 additional articles on specific themes. CSE expanded its network within the climate community, both domestically and internationally and is now in touch with climate negotiators, global NGOs, global media, think tanks and experts.

CSE's COP 27 efforts and outputs are summarised here: https://www.downtoearth.org.in/climate-change/cop-27

Communicating and building capacity on the science and urgency of climate change

As part of this effort, CSE works with 'multiplier communities' to build capacities of educators, the media as well as the wider public on the science, policy and politics of climate change, using the perspective of the Global South. CSE also amplifies influence and visibility to champion Global South positions in the wide climate debate and on global platforms.

- In total, CSE trained 123 individuals through two online training programmes.
- Weekly climate newsletter: 35,000 subscribers, 19 per cent open rate (up from 28,000 subscribers, 14 per cent open rate in March 2022).
- Down to Earth Web articles published: 38
- Down to Earth Print coverage: 5 articles, including two Down to Earth cover stories on loss and damage, and on climate and trade.
- Contributions to two chapters in State of India's Environment; one video and one press note on heat waves.
- Anchored three Twitter/Linkedin live talks (on heat waves; loss and damage; COP 27)
- Was quoted/appeared in 34 media stories.
- CSE was part of several external expert panels, includingon the German outlet DW at COP27; on Climate Action Network South Asia; Observer Research Foundation; and on Climate Action Network, Europe.

The programme is designed to push for global action for equity and ambition on climate change. CSE has taken definitive positions on markets for transformative action, equitable ambition in NDCs, focus on net zero and non-state action, and commentary on sinks, adaptation fund, loss and damage and methane emissions, among others.

Climate ambition and UNFCCC:

- Attended SB 56 in Bonn, and COP 27 in Egypt
- Pre-COP 27 factsheets
- Pre-COP media briefing

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 and 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**

- Pre-COP Twitter live talk with CSE COP27 team
- Loss and damage cover story and online webinar with experts
- Interactions with MOEFCC ahead of and during COP 27

Sinks

- Paper on sinks, offsets and India's forests

Methane

- Paper on global methane emissions that was also turned into a factsheet for COP27 and a SOE article

Other areas

- Cover story on climate and trade, and webinar convening experts in Global South. Interactions with CAN Europe, Power Shift Germany, and Justice is Global (US) on the issue of climate and trade. Discussion with IDDRI on financial systems reform.

Select Down to Earth articles

- Cover story on loss and damage: https://www.cseindia.org/special-edition-loss-and-damage-11471
- Cover story on climate and trade: https://www.cseindia.org/a-new-order-of-trade-11637

IPCC report coverage

- https://www.downtoearth.org.in/blog/climate-change/six-takeaways-from-ipcc-ar6-report-long-term-benefits-of-cutting-emissions-today-outweigh-costs-82213
- https://www.downtoearth.org.in/news/climate-change/climate-crisis-6-key-messages-from-ipcc-synthesis-report-88348

UNFCCC and COP coverage

- https://www.downtoearth.org.in/news/climate-change/fulfilling-cop26-promises-can-limit-global-warming-to-2-c-study-82550
- https://www.downtoearth.org.in/news/climate-change/least-developed-countries-want-major-emitters-g20-to-increase-climate-efforts-83057
- https://www.downtoearth.org.in/news/climate-change/bonn-climate-conference-begins-with-tense-stand-off-on-loss-and-damage—83171
- https://www.downtoearth.org.in/news/climate-change/bonn-climate-conference-glasgow-colonial-pact-shifts-burden-of-climate-change-to-developing-countries-say-parties-83278
- https://www.downtoearth.org.in/news/climate-change/bonn-climate-conference-loss-and-damage-discussions-nothing-but-talk-shop—83315
- https://www.downtoearth.org.in/news/climate-change/cop27-will-be-implementation-cop-egypt-cop27-presidency-83695
- https://www.downtoearth.org.in/news/climate-change/india-s-updated-climate-pledge-to-paris-agreement-gets-union-cabinet-nod-84138
- https://www.downtoearth.org.in/blog/climate-change/loss-and-damage-2022-pakistan-floods-heighten-need-for-climate-reparations-84721
- https://www.downtoearth.org.in/interviews/climate-change/run-up-to-cop27-john-kerry-is-scared-of-the-floodgates-of-litigations-on-accepting-loss-and-damage—85662 https://www.downtoearth.org.in/blog/climate-change/cop27-switzerland-wants-major-emitters-and-big-developing-economies-to-do-more-on-mitigation-85873
- https://www.downtoearth.org.in/blog/climate-change/five-big-disagreements-on-loss-and-damage-as-cop27-clock-ticks-on-86027
- https://www.downtoearth.org.in/news/climate-change/cop27-clear-battle-lines-drawn-on-loss-and-damage-as-rich-try-to-divide-the-poor-86070
- https://www.downtoearth.org.in/news/climate-change/cop27-will-fail-because-of-the-us-eu-and-global-north-not-the-developing-world-86083
- https://www.downtoearth.org.in/news/climate-change/cop27-was-a-win-for-the-loss-and-damage-cause-here-is-what-transpired-and-the-road-ahead-86089

Global climate policy

- https://www.downtoearth.org.in/blog/climate-change/us-new-climate-bill-the-good-the-bad-and-the-fossil-addicted-84275
- https://www.downtoearth.org.in/news/climate-change/us-japan-others-to-fund-indonesia-s-transition-to-clean-energy-86007
- https://www.downtoearth.org.in/news/climate-change/eu-s-carbon-border-tax-is-it-regressive-and-protectionist-or-an-incentive-for-global-decarbonisation—86681
- https://www.downtoearth.org.in/news/climate-change/climate-hypocrisy-germany-s-coal-fuelled-power-sector-more-polluting-than-india-china-currently-86306
- https://www.downtoearth.org.in/news/climate-change/us-emissions-up-1-3-in-2022-despite-coal-displacement-by-gas-renewables-report-87101
- https://www.downtoearth.org.in/blog/climate-change/eu-follows-us-by-boosting-its-domestic-green-industry-support-outcome-for-global-south-uncertain-88323

INDUSTRIAL POLLUTION PROGRAMME

Designed to help industry internalise energy and resource efficiency, and point it to the path of low-carbon development

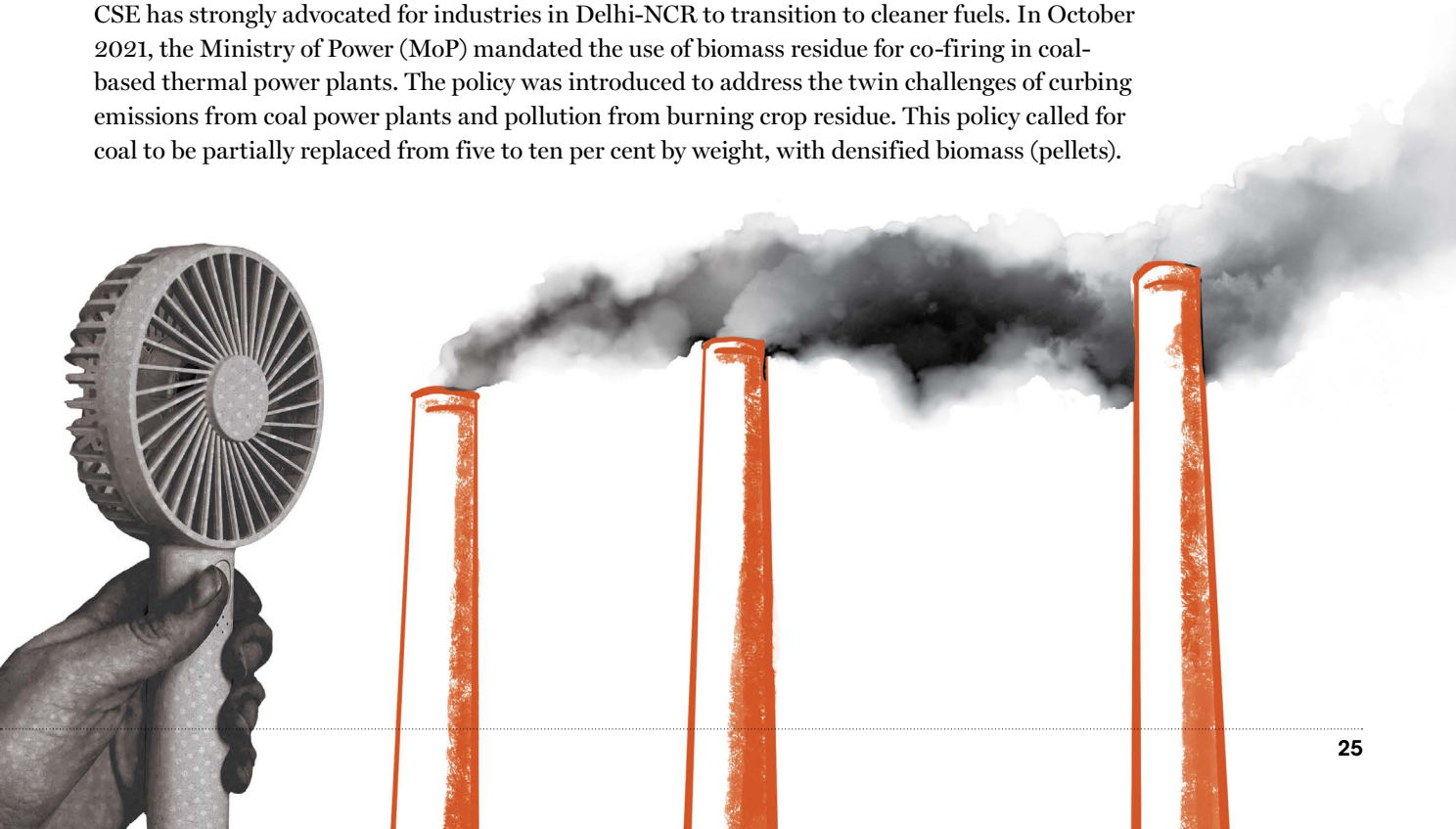
INDIA PROGRAMME

Focus on hard-to-abate sectors

The study on 'Decarbonizing India's iron and steel sector' was a key piece of research conducted as part of the programme's focus on resource efficiency, pollution control, and industrial sector decarbonization. This provides a detailed insight into the current status of India's iron and steel sector, it's greenhouse gas emissions, and suggests pathways for greenhouse gas emissions reduction.

Push for biomass co-firing in coal-based power plants

CSE has strongly advocated for industries in Delhi-NCR to transition to cleaner fuels. In October 2021, the Ministry of Power (MoP) mandated the use of biomass residue for co-firing in coal-based thermal power plants. The policy was introduced to address the twin challenges of curbing emissions from coal power plants and pollution from burning crop residue. This policy called for coal to be partially replaced from five to ten per cent by weight, with densified biomass (pellets).



Workshop: Decarbonizing India's iron and steel sector by 2030 and beyond

The workshop, conducted to discuss CSE's report findings, covered options on fuel shift, low carbon technology, energy efficiency, increasing generation and usage of steel scrap and carbon capture utilisation and storage for the Indian iron and steel sector. It included participation from national and international steel companies, government ministries and agencies, industry associations, regulatory authorities, and private sector consultants.

Apart from MoP, Commission for Air Quality Management (CAQM) for NCR and adjoining areas also issued a direction for all the TPPs in NCR and 300 km radius of it, to co-fire biomass by replacing coal. As per the CAQM Act of 2021, the non-adherence to the CAQM direction will be considered as an offense 'punishable with imprisonment' for a term that may extend up to five years or with fine of up to INR 1 crore or both.

CSE's study, Status of biomass co-firing in Delhi-NCR included an extensive field survey with focus on challenges that limit its uptake in the 11 coal-based power plants in Delhi NCR (less than one per cent of coal has been replaced with biomass in any of the coal thermal power plants in Delhi/NCR). Co-firing is being carried out only intermittently based on the availability of biomass. The study found that the escalating cost of biomass pellets and more clarity in regulatory mechanisms can help fulfil the mandate.

Clean fuels for industry

In June 2022, the Commission for Air Quality Management (CAQM) mandated the use of cleaner fuels in industries located in Delhi/NCR and also come up with the 'approved cleaner fuel list'. To better understand the pattern of fuel shift, including changes and tentative costs, challenges faced by industries and strategies they adopt, CSE's study, "Refuelling Delhi-NCR" was based on a field survey conducted in the industrial areas of Alwar and Bhiwadi. The study highlighted the illegal use of wood as a fuel.

CSE's engagements with regulatory authorities, including the Commission of Air Quality Management (CAQM) and the Rajasthan State Pollution Control Board (RSPCB), contributed to pushing the needle on important regulation. CAQM in its Direction No: 65 (Standard list of approved fuels for various applications across NCR), included a clear statement of prohibiting the use of wood as a fuel in industries in Delhi/NCR. Similarly, RSPCB recommended industries to also include biomass in their fuel mix.

Workshop: Pollution control strategies for small and medium scale industries

The workshop focused on common combustion facilities, role of technology in pollution control and fugitive emissions from the small and medium scale industries. The event was attended by H.E. Freddy Svane, Danish Ambassador, and Member Secretary of Haryana and Madhya Pradesh State Pollution Control Board.

Industrial air pollution control–Rajasthan

Earlier CSE studies (e.g. Assessment of Industrial Air Pollution in Jaipur, 2021), identified the Vishwakarma Industrial area (VKIA) as a major source of industrial pollution—especially metal industries and management of non-hazardous industrial waste.

By way of a deep dive on the issue, CSE's study, Assessment of non-hazardous industrial waste in VKIA, conducted in collaboration with RSPCB, assessed the type and quantity of non-hazardous industrial waste generated in VKIA, as an initial step for developing waste management facility in the industrial area. Poor handling and poor management leads to dumping of waste in industrial areas, which contributes to air pollution and land pollution.

CSE's study, Improving the environmental performance of the foundry sector in VKIA, highlights the good practices prevailing in the different parts of the country that contribute to reducing the carbon footprint of the sector with the co-benefit of reduced local air pollution. This will be followed-up with the state pollution regulator this year, for example in making a 'standard operating procedure', or SOP, for the foundry sector. CSE's national workshop and exposure visit in September 2022, Controlling Fugitive Dust Emissions from Stone crusher and Mineral grinding sector, convened pollution regulators and officials from nine states, who provided their inputs to CSE's proposed guidelines for the stone crusher and mineral grinding sectors. CSE has shared these proposed guidelines for stone crushers with all SPCBs and also with CPCB, which has recently incorporated all the points suggested by CSE. This too will be taken up this year.

Industrial air pollution control–Maharashtra

Maharashtra has the largest number of non-attainment cities, 18, and also has the foundry cluster in Kolhapur. CSE's study on the Kolhapur foundry sector recommended specific good operating practices such as reusing sand by installing common and reclamation units, in order to reduce air pollution in the Kolhapur foundry cluster.

The Pune region in Maharashtra is home to the small-scale but highly polluting stone crusher industry in terms of 'fugitive emissions', and the sector faces several cases filed against stone crusher units in the National Green Tribunal (NGT). A 2016 joint committee of CPCB and the Maharashtra state pollution control board, MPCB, had given specific recommendations for the sector to curb air pollution. CSE's study, Status of stone crushers in Pune, Maharashtra assessed the sector's environmental performance and also the status of implementation of the 2016 Committee's recommendations.

The programme conducted a total of 17 capacity building workshops (nine onsite and eight online) to help build capacities in the areas of industrial pollution control, environmental impact

Regulator's order to marble and dolomite units to reuse slurry to make tiles, mosaic

A huge amount of stone slurry waste is generated in VKIA which can be reused to make tiles, mosaics and white cement. The Rajasthan State Pollution Control Board's January 2023 order relaxed rules for marble/ dolomite processing units that reuse waste materials, by increasing the minimum distance criteria for the establishment of mineral grinding units from the nearest habitat. Another RSPCB orders also recommend the use of slurry for making tiles/paver blocks, and have recommended the use of stone slurry in cement manufacturing.

and compliance assurance, EIA, continuous emission monitoring systems (CEMS), low carbon pathways for industrial sectors and developing air quality management plan for industrial areas, among other topics.

GLOBAL PROGRAMME

CSE'S EFFORTS to address the challenges faced by Lake Victoria continued this year, as did its partnership with the National Environmental Management Council (NEMC), Tanzania to understand pollution sources, abatement measures and regulation for the Lake Victoria and its urban catchment in the Mwanza region. CSE's report, 'Development of Environmental Management Strategy Towards Ecological Integrity of Lake Victoria'. The report was released in a high-level and multi-stakeholder meeting in July 2022 at Dar Es Salam, Tanzania. The Minister of State in the Vice President's Office, Hon Dr Selemani Jafo was supportive of the collaborative efforts between CSE and NEMC on pollution abatement of the lake, which supports millions of livelihoods in Tanzania, Kenya and Uganda. He highlighted this initiative as an important intervention of Tanzania's National Environmental Master Plan of Strategic Intervention 2022-2032.

As pollution from Mwanza is a key polluter of Lake Victoria in Tanzania, an important outcome of the meeting was the commitment to monitor the water quality around the Lake Victoria watershed in the Mawanza region. CSE worked with NEMC officials to conduct extensive water quality monitoring in Mwanza region; the results were shared in a subsequent report, Lake Victoria: Roadmap for Management of Water quality in Mwanza City, Tanzania. The report, released in a public event in January 2023, convened key stakeholders, and reached a broad consensus to work collaboratively on implementing the report's recommendations.

The programme also works to strengthen capacities of pollution regulators for effective compliance and enforcement across the Global South. Several workshops were conducted for key regulatory agencies on the topics of audits, compliance and environment impact assessments (EIA) and social impact assessments (SIA).

On 14-15 July, CSE released another report, Environmental Impact Assessment: Evaluation of legislations in countries of Africa and South Asia at a meeting in Dar es Salaam. Environmental Impact Assessment (EIA) is a decision-making support tool to assess the impacts of various projects on the environment. The release of the report at a public event was attended by regulators from Ghana, Namibia, Zambia, Kenya, Tanzania and Mozambique. As EIA is backed by legislation, CSE has analysed different EIA processes—screening, scoping, preparation of draft EIA, public hearing and compliance mechanism etc—of different countries. The report also examines five significant indicators, including environmental and social impact mitigation aspects, that need to be integrated into existing legislation to make this vital piece of environmental governance more robust. Regulators from different countries requested CSE's assistance in pushing for amendments to their respective legislations. CSE and NEMC are also working to strengthen the environmental impact assessment regime in Tanzania. A 'Terms of Reference' for mining and industrial development projects was also released during the January meet.

SUSTAINABLE FOOD SYSTEMS PROGRAMME

To influence the food business to align with societal objectives of nutrition, livelihoods and safety

INDIA PROGRAMME

IN INDIA, the programme's campaign to address animal and environmental aspects of AMR spread was eventful.

CSE was also able to initiate discussions around the role of preventive approaches like ethnoveterinary medicine (EVM), instead of exclusive reliance on antibiotic-based disease prevention that discounts intensification, which is the real problem. CSE pushed for upscaling ethnoveterinary practices in the dairy sector as a cost-effective and farmer-friendly alternative to antibiotics in the dairy sector. It published a detailed case study (in Down to Earth) followed by a global webinar during the World Antimicrobial Awareness Week (WAAW), 2022. There is much interest in India and also among global (especially Africa) stakeholders. This has also created some pressure among poultry sector stakeholders to come up with something similar.

Antibiotic misuse is now on the national stage—a question was raised in the Lok Sabha on the issues of indiscriminate use of antibiotics as growth promoters in poultry to the minister of fisheries, animal husbandry and dairying. Meanwhile, the Bureau of Indian Standards (BIS) is discussing antibiotic growth promoters in poultry feed standards; CSE is part of the concerned BIS committee.

A key focus area this year was on understanding pharma waste, especially antibiotic manufacturing discharge, which is a very controversial and important area in the case of India and at the global level. CSE research shows that the evidence of antibiotic pollution is strong in India. Regulators are keen to develop standards, even as the government is resisting the National Green Tribunal order to adopt antibiotic standards in April 2022.

The programme also engages with state-level action plan implementation from a one-health perspective—interlinkages among animal food production, environment and human health. The focus here is to get one-health perspective included state AMR containment action plans. About 80 stakeholders from about 20 states were convened to attend a One-health workshop, which CSE conducted in partnership with WHO.

Organic and regenerative agriculture

Three important developments occurred in the year that were new areas/aspects for the team. CSE engaged with state agriculture departments in four states (Rajasthan, Punjab, Haryana, Uttar Pradesh) to help build capacities of state agriculture extension workers to help states transition to organic / regenerative farming practices; CSE set up an organic demonstration plot at CSE's training facility in Nimli (Rajasthan), with assistance and inputs from Centre for Sustainable Agriculture, a leading organic farming advocacy and practice-oriented organisation; CSE was able to conduct a scoping exercise to better understand and prepare to address agriculture and climate change mitigation options.

CSE is actively contributing to the government's renewed push for organic farming in the country. In Sept, 2022, India came up with its National Mission on Natural Farming 2023–2026, with a budgetary allocation of INR 1,584 crore, to bring 75,000 ha of land under natural farming. The Union Budget 2023-24 allocated 10,000 bio-input resource centres to promote natural farming; The government of India approved setting up a national-level cooperative society for organic products to be constituted under the Multi State Cooperative Societies Act, 2002 with an authorised share capital of INR 500 crore.

CSE's is proposing a system of decentralised organic input production (State of biofertilizers and organic fertilizers in India report).

Questions were raised in the lower and upper houses of the Indian Parliament on topics related to organic fertilizer promotion and subsidies, setting up bio-fertilizers units, the Soil Health Card Schemes, and the status of biofertilizers units in India, among others. CSE's organic and biofertilizer report had raised similar concerns. Similarly, a March 2023 report of NITI Aayog's task force, which emphasised the promotion of organic and biofertilizer sector/industry, incorporated CSE's research and data. ICAR's draft Natural Farming Course Curricula includes CSE's report—State of Organic and Natural Farming: Challenges and Possibilities, 2020—as part of suggested readings.

CSE highlighted how select FPOs, retail corporates and state programmes are trying to provide market access to organic and natural farmers. The study on Odisha millet mission was acknowledged by the Chief minister's office.

CSE's report, 'Evidence (2004-19) on holistic benefits of organic and natural farming,' released in April 2022 by the then Vice Chairperson of NITI Aayog, during a conclave on sustainable food systems seems to have helped bring necessary focus on sustainability of organic and natural farming and move beyond only productivity. The conclave facilitated open exchange of knowledge and views among civil society on different aspects of nutrition, health, environment, and agriculture.

GLOBAL PROGRAMME

Anti Microbial Resistance (AMR)

It is clear that there is much interest and demand for Global South's perspectives on food systems with focus on environment/animal AMR linkages at global discussion platforms, such as with the Global Leaders Group on AMR, in which CSE is a member. The programme also continues to engage deeply with other global platforms such as WHO, FAO, OIE, UNEP and with civil society/ scientific stakeholders.

CSE participates actively in global discussions on the environment and animal dimension of AMR, and is often given the opportunity to moderate discussions; inputs are acknowledged in GLG output documents and the team is invited to join global committees/working groups. CSE is also part of joint research and advocacy efforts – for example, recommendations have been incorporated in UNEP's report on AMR; helped develop WHO's One health priority research agenda report. CSE argued for the importance of 'prevention' to combat AMR, specifically in view of the Global South. The discourse is now moving towards it. The World Antimicrobial Awareness Week-2022 was on the theme of prevention. CSE could create a lot of interest in the preventive ethnoveterinary medicine practised in the Indian dairy sector. CSE's 2021 report on critically important antimicrobials (CIAs) contributed to WHO's proposed new list of CIAs.

SOLID WASTE MANAGEMENT PROGRAMME

To address management, technologies and regulations for dealing with waste generation triggered by growing affluence and resource intensive consumption

INDIA PROGRAMME

IN INDIA, the programme's objective is to mainstream circular economy principles in the solid waste management sector. The mandate is to assist two 'model zero-waste' cities, in Agra (Uttar Pradesh) and Gurugram (Haryana/NCR). CSE also anchors a 'Forum of Cities that segregate' and engages with a wide network of 300 cities across India on waste management and circularity. 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.

Forum of cities

Research, capacity building and advocacy are designed to build capacities of cities on integrated waste management. A total of 20 online trainings (reaching 1402 participants) and 18 onsite trainings, reaching 705 participants—78 per cent were city managers responsible for solid waste management in their respective cities—were conducted in the year. These were aligned with the objectives of Swachh Bharat Mission 2.0 (Clean India Mission 2.0), and CSE will monitor the performance of cities in terms of improvements in their 'rank' in the annual Swachh Survekshan Survey, the closely watched annual cleanliness survey conducted pan-India. A specific Forum of North Eastern Cities was initiated to address the specific challenges of solid waste management in the eight North Eastern States. Forum membership already covers 64 per cent of northeast cities.

In 2022-23, a total of 308 cities participated in events and activities conducted as part of the 'Forum of Cities that Segregate'. Of these, 286 cities (92 per cent of members) have

submitted their city solid waste action plan through the 'State Level High Power Committee' to the Ministry of Housing and Urban Affairs to trigger the release of the first tranche of additional central assistance (ACA) under SBM 2.0. Interestingly, 274 (88 per cent of cities) have improved their Swachh Survekshan Ranking between 2020 and 2022.

Research, advocacy on waste management, plastics

As part of ongoing research and advocacy, the focus this year was on legacy waste management, composting, implementing segregation, and more recently, on the management of plastics in urban India. The programme produced a total of 13 publications, of which three 'toolkits' have been adopted by the Ministry of housing and urban affairs for managing wet waste, dry waste, plastics and legacy waste management. Other publications on domestic hazardous waste, sanitary waste and plastic life cycles were well received. The programme's publications now feature in the national knowledge centre portal of the ministry for SBM 2.0. CSE's toolkit for SBM 2.0 was also showcased at the government's national-level event, the Swachh Sheher Samvad 2022, in the presence of 2,000 Indian cities in September 2022. Representing a key policy impact, the CSE-drafted 'Inter-ministerial roadmap for circular economy' has been pivotal to influence reforms of existing policies and introduce new policies, creating budget allocations for promoting bio methanation based industries using municipal solid waste and agro-residue as feedstock.

Deep dive in Agra and Gurugram

As part of its deep dive initiative, CSE also works directly with the cities of Agra (state of Uttar Pradesh) and Gurugram (Haryana) to help city authorities put in place planning and implementation strategies on integrated solid waste management based on circularity and sustainability principles.

The programme tracks outcomes in terms of improvements in the urban ministry's all India city rankings. Agra improved and climbed 1 rank up (nos. 23) in 2022, with a 24 per cent improvement in the service level progress score, which evaluates sustainable systems for waste management. A key achievement was the city has managed to complete 94 per cent biomining of legacy waste, and at present ranks among the top 10 cities in India in terms of dumpsite remediation.

Other notable milestones include:

- About 16 tonnes of waste from petha (soft candy made from ash gourd) has been channelled to gaushalas (stray cattle compounds)
- About 41 per cent of the primary collection fleet has been redesigned to receive 4-way segregated waste.
- CSE's Tajganj pilot has achieved 95 per cent source segregation and the same approach has now been rolled out in the remaining 94 municipal wards
- The first decentralised plant in Agra has been commissioned in Hariparvat zone with material recovery facility and tub composting system.

Gurugram similarly has improved by climbing 5 ranks to nos. 19 in 2022. Gurugam's SLP score (which evaluates sustainable systems for waste management) has improved by 19per cent.

- In a significant move, the city authorities have issued a notification to enforce the provision of SWM Rule 2016 for bulk waste generators (typically, institutions that

produce more than 100 kgs of waste each day), and have expanded this to 693 sources.
- Also, two of the three transfer stations have been equipped with manual sub-segregation of dry waste.
- Conducted a pilot in one municipal ward in old Gurugram, CSE mapped the informal sector in waste management in the city, and a strategy will be developed to better incorporate this sector's efforts, including the poor, marginalised, including women, in the city's formal waste management systems.

There is significant progress made by the programme in meeting and exceeding stated outcomes in terms of actual and imminent scale up, both at the level of 'deep dive' efforts in Tanzania, as well as the larger efforts to form a committed, active coalition of countries of the Global South working towards instituting circular economy principles in waste management in their respective countries.

In **Tanzania and Zanzibar,** CSE's cooperation agreement with the National Environment Management Council (NEMC) and the (draft) agreement with Zanzibar Environmental Management Authority (ZEMA) and the Ministry of Blue Economy, Fisheries and Tourism (MoBEFT) paves the way for CSE to influence policy and implementation in all the 183 Urban Local Bodies across Tanzania through the national environmental regulator and the President's Office (Ministry) for Regional Administration and Local Government (PORALG). The cooperation with NEMC calls for CSE to provide assistance in improving the existing solid waste management practices in Tanzania, with focus on source separation, improving collection efficiencies, scientific treatment and disposal based on the principles of the circular economy. CSE's report, Assessment of the Solid Waste Management Ecosystem, was well received and was followed by 12 virtual trainings covering various facets of municipal solid waste management, which helped capacitate 186 city officials from Tanzania.

In **Eswatini,** based on the outcome and recommendations from the report, Solid Waste Management in Eswatini – Challenges and Opportunities, there is intent and interest to take forward CSE's recommendations for policy and implementation. CSE's cooperation partner, National Disaster Management Agency, NDMA, has brought on board the Eswatini Environment Authority (EEA) into the cooperation to facilitate source separation of waste, decentralised management approach, and sustainable landfill management, among other measures. EEA is now part of CSE's Global Forum of Cities for Circular Economy (the CSE-EEA cooperation agreement will be formally signed this year). A total of eight training workshops were conducted for 47 representatives from the regional administration and from cities that plan to implement sustainable waste management practices.

The **Global Forum of Cities for Circular Economy** was created to augment circularity in municipal solid waste management. The forum provides a platform for sharing evidence-based learning, providing mutual assistance in framing regulations, guidelines, monitoring protocols and standards on sustainable solid waste management, and support learning through capacity building programmes and exposure visits. At present, 19 countries from the Global South—15 countries from Africa and five from Asia are part of the network, including Tanzania, Eswatini, Uganda, Ghana, Ethiopia, Rwanda, Namibia, Zambia, Mozambique, Kenya, Zimbabwe, Cote d-Ivoire, South Africa, Cameroon, Senegal, Nepal, Bangladesh, Sri Lanka, India and Bhutan.

The forum is active, efficacious and visible with the participation of senior ministry officials directly dealing with environmental matters, as well as high-level city functionaries. In 2022-23, three GFCCE meetings and workshops were convened, and two global reports/publications were produced by CSE that provide an assessment of the current situation of urban solid waste management and plastic waste management in these partner countries.

The Forum was launched in Dar es Salam, Tanzania at a pan-Africa meeting and workshop in July 2022, with the participation of senior government officials from Zambia, Namibia, Uganda, Ethiopia, Mozambique, Ghana, Rwanda, Eswatini, Kenya, and Tanzania. CSE released a scoping paper with an overview of the challenges and opportunities for circularity and improved plastic waste management, together with policy recommendations for the waste management sector in countries of Sub-Sahara Africa.

CSE's report, Plastic waste management in Africa: An overview was released at the second GFCCE workshop in January 2023 in Dar es Salaam. Delegates from nine African countries and the High Commissioner of India in Tanzania, Mr. Binaya Srikanta Pradhan, Dr. Samuel Mafwenga, Director General of the National Environment Management Council (NEMC), and Menan Jangu, Director-research (NEMC), Government of Tanzania. The report uses secondary data and covers the state of plastic waste management systems and practices in 15 countries in Africa—Eswatini, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Rwanda, Tanzania, Uganda, Zambia, Democratic Republic of Congo, Nigeria, South Africa, Côte D'Ivoire and Cameroon. A third GFCCE meeting and exposure visit is planned in New Delhi in May 2023, with a deeper focus on circularity and the management of plastics.

MEDIA RESOURCE CENTRE

Disseminates topical, relevant environmental information and data of public interest and convenes sector expertise and thought leadership for informed environmental advocacy

CSE'S MEDIA programme facilitated the participation of national, regional and international media in events and webinars organised by different programme teams in CSE. A regional media briefing in Bhubaneswar (Odisha) on the Forest Rights Act and community initiatives in protecting resources like forests and forest produce was attended by 54 journalists from all over India. Manthan, CSE's series of briefings and skill-building workshops designed for journalists writing in Hindi, continued—three Manthan workshops were conducted, two of which were online and one onsite (in Bhopal). Over 100 journalists from the Hindi media participated. An online briefing was also organised for journalists in the northeastern region of the country—the initiative was titled, Northeast Narratives. Forty media people from eight northeastern states participated.

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

Outreach, 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 press releases (over 50 press releases were disseminated in the year). CSE's weekly e-newsletter reached over 350,000 subscribers.

Strengthening capacities of media, environment communicators

CSE's data centre in 2022-23 conducted six online trainings, reaching a total of 626 working journalists, research scholars and development communicators in the Global South, across 26 countries and five continents—Asia, Africa, Europe, North America and South America (encouragingly, about 46 per cent of participants were female).

Trainings are designed to fill critical capacity gaps—in particular, to strengthen data-driven reportage and to widen exposure on specific sectors (e.g. on Air Pollution, Climate Change and WASH sector)

- Data journalism/climate (Online Course April 11-25, 2022) | 120 pax
- Data journalism/water (Online Course July 29-August 14, 2022) | 76 pax
- Data journalism/climate (Online Course September 29 - October 13, 2022) | 147 pax
- Data journalism/climate and SDGs (Online Course December 14 - 28, 2022| 100 pax
- Data journalism/environmental health (Online Course January 31 - February 14, 2023| 77 pax
- Data journalism/climate (Online Course March 28 to April 11, 2023) | 106

Media Cafes for 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, 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. Each workshop is designed to focus on one current and key area of interest. 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.

A **pre-COP 27 briefing** by CSE was well received by journalists from India and the Global South. Over 100 participants were briefed on what was on the COP27 agenda in Sharm el Sheikh, Egypt. A CSE team that attended the COP27 deliberations kept up the engagement with journalists as part of our strategy of giving the Global South media a nuanced understanding and perspective on what was happening at this important global negotiation.

News media visibility: CSE's media presence (mentions in print, online and electronic (TV) platforms of CSE research, or CSE staff used as sources for stories) has improved. As against CSE mentioned 2,177 times in media clips last year, in 2022-23, CSE appeared in 2,336 media clips (an increase of more than 7 per cent). This includes CSE research or advocacy mentions in national (1,688), regional/sub national/ regional language media (290) and international (358) media coverage. Importantly, international coverage has almost doubled from last year, from 195 to 358 media mentions—an increase of 84 per cent.

See annex for details

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 journalists on issues that CSE is engaged.

Mutimedia output 2022-23

ONLINE DISSEMINATION

14,35,041
CSE websites site visits

11,77,530
Users (annual).
19% users were from outside India

23,59,618
Pageviews.
+36% from last year

WHAT WE DID

290 Videos for DTE on Youtube

60 Training videos for CSE

37 Livestream events for CSE

CUSTOM FORMATS

235
short explainers/video cards (1–4 minutes duration ea.)

37
long explainers/ animations (over 8 minutes duration)

20
part video explainer series in Hindi

11
Young Environmentalist master class webinars for school children

FIGURES COMPARED TO 2021-22

2021-22 2022-23

Total views
12.5 million
14.6 million
-14.4%

Subscribers added
251,500
144,800
73.6%

Total Subscribers
515,700
(106,700 more than last year)

IN-DEPTH TOPICS

140 Videos
Climate Change Impacts/extreme weather events, negotiations

5 videos
Solar Energy

13 videos
Good food and food security

5 videos
Solid waste management

4 videos
Africa (misc. topics)

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

2022-23 WAS a good and productive year, with active engagements with schools under the Green Schools network (GSP) picking up following the Covid-lockdown years. A high point was the GSP annual audit: with schools returning to normal operations after a gap of three years, and covering six key subject areas. Importantly, the audit returned to being an onsite, physical activity, with an award ceremony to celebrate the country's greenest schools.

The focus of the courses, trainings and workshops was on four key verticals—climate change, solid waste management, renewable energy and air pollution. A climate course for teachers launched during the pandemic years went into three batches, and a convocation of the teacher trainees brought them all together at AAETI, CSE's training facility near Delhi. The engagement in the deep-dive state of Himachal Pradesh on renewable energy took a more concrete shape with 'Solar 30' group—a selection of 30 schools from the state that have made commendable and measurable progress in moving to renewable energy sources of power.

The Gobar Times-Young Environmentalist platform continued playing its designed role – that of a creator, collator and promoter of learning resources for the youth. Visitor numbers to the website have been indicating a steady rise, and events hosted under its banner have remained popular.

Nudging schools towards sustainable solid waste management practices

The programme has a three-fold mission on solid waste – leverage the GSP audit with member schools to push for measurable change in solid waste management practices on campus, and with individual students and their families through the audit@home for driving

The GSP Audit and Carnival 2022–23

The GSP Audit recognises the urgent requirement to incorporate environmental education into the school curriculum. In 2022–23, a total of 708 schools successfully completed and submitted the audit reports.

The team's engagement with partner and like-minded organisations was scaled up. The team addressed 160 teachers in Gangtok (Sikkim) at a two-day capacity building session for teachers, organised by the Sikkim government's ENVIS Hub, department of forest and environment. Issues included solid waste management (with focus on plastics), the challenges of sustainable development, and climate change, among others. As part of orienting teachers to the audit process, a total of three workshops for 105 teachers were conducted for schools under Jawahar Navodaya Vidyalaya Samiti. At WaterFest 2023 organised by PondyCAN in Puducherry, the team conducted a similar workshop for 20 teachers from government and private schools. Online orientation sessions were conducted for schools under the Church of South India and Satya Bharti Foundation.

The GSP Awards ceremony also made a spectacular comeback—as a one-and-half day physical event hosted by CSE in February 2023 in New Delhi. The GSP Carnival, as it was named, incorporated the GSP awards and a host of other events, exhibitions and workshops. About 400 school children, teachers and educators from 81 schools that topped the GSP rankings, attended; also present were representatives from GSP partner organisations such as HIMCOSTE, Bharti Foundation and Punjab State Council for Science and Technology. The coveted 'green' tag was bagged by 106 schools from among the 708 which had submitted the audit; 19 received the topmost awards.

Events at the Carnival included a quiz on climate change; a renewable energy fair and exhibition, where school children put up models they had created; a Gobar Times Design Studio, in which children tried their hand at re-visualising pages of the magazine; a workshop on solar energy for teachers of the 'Solar 30' group of schools; and a DIY session for children where they were taught to make a solar lamp.

change in households. Also, use the 'Forum of Schools that Segregate', to work closely with select schools and guide them towards becoming model campuses. As part of its support to CSE's larger commitments, work with schools and municipal authorities Agra to streamline the schools' waste management systems.

In 2022-23, the team organised an online workshop on dumpsites/landfills for 69 school teachers (51 were female), specifically on how institutions and individuals can ensure that the waste we generate does not land up in dumpsites.

The team also conducted an audit@home-waste warriors for school children that was aimed at evaluating the state of household waste management practices. The audit received over 1,000 student registrations. As part of the effort to enhance waste management practices, each student received a personalised scorecard that assessed their individual practices and level of awareness regarding waste management.

The Forum of Schools that Segregate, set up during the pandemic period, now has 132 members. In the coming year, the team plans to scale up its interactions in all the three missions, with a special emphasis on its initiatives in Agra.

Propelling renewable energy in schools

The team works with its partner organisation, HIMCOSTE (Himachal Pradesh Council for Science, Technology and Environment) to popularise and build awareness on renewable sources of power, mainly solar. The GSP-HIMCOSTE partnership promoted energy efficiency in schools in Himachal by promoting and providing technical expertise in the installation of solar panels. The

Gobar Times and Young Environmentalist

Offering learning resources at a touch

12
e-editions of Gobar Times were published – the most popular was the April 2022 issue dedicated to environment-themed movies.

12
events, including its MasterClass series, hosted by Young Environmentalist website; over 7,000 registrations.

23,681
Subscribers to GT-YE (unique email IDs who have signed up).

36,188
Average monthly visitors to the website.

state government has selected 30 schools where rooftop solar systems will be installed – GSP serves as the knowledge partner for this initiative. It builds awareness of students and teachers and helps them understand the operational issues related to these power systems.

To facilitate this initiative these schools have ben brought together under an umbrella grouping 'Solar 30'. The first of a series of workshops was organised for for 45 participants from these and other government schools in Himachal Pradesh. The audience included teachers, district science supervisors and education officers, including the deputy director of the Department of Education, and key officials from HIMCOSTE. A second teachers' workshop, for 30 participants from schools in Himachal, was conducted in CSE's AAETI campus in Nimli.

The audit@home: energy managers was rolled out for more than 500 students. This was designed to help students understand and take action towards sustainable energy consumption in their homes. Participants each received a personalised scorecard showcasing their energy practices and level of awareness.

Climate change in school curriculum

The programme had conducted a series of three online training courses on climate change for 105 teachers to guide the teaching of climate change concepts, policy and perspectives in classrooms. Twenty of the trainee teachers were nominated to attend a Climate Course Trainees' Convocation at AAETI. Spanning three days, the convocation encompassed a series of informative sessions on topics including climate change, extreme weather events, sustainable development goals, and integrating climate change into classroom curricula. The team also started a newsletter to keep these trainee teachers updated on climate change negotiations, issues and science.

Sensitising schools on air pollution

Air—clean and unclean—and the linkages with health is an important intervention for the programme. An online session was organised for 140 school teachers, principals and authorities (transport managers and coordinators in schools) on 'Air Pollution and Mobility Practices'. Many more watched the event on various livestreaming platforms. The unit also organised a hugely popular online quiz on air pollution. More than 2,000 children signed up for the quiz events, with 500 active participants.

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'S policy research, advocacy and capacity building nationally and at the sub-national level targets four initiatives: Green campus, Centre for circular economy (C&D Waste), Affordable housing for thermal comfort and sustainability, Climate-resilient cities and resource efficiency.

Green campus initiative

The programme deploys a 'toolkit' it had developed earlier and works with institutions and campuses that are part of the Green Campus Network to improve their performance in the National Assessment and Accreditation Council (NAAC) ratings on green campus indicators. CSE handholds and builds capacities of campus administration on their green feature planning and deployment. This year, CSE's engagement with educational institutions on green campus has resulted in appreciable improvements in NAAC ratings—success stories include education campuses in Punjab and Himachal Pradesh. Trainings and workshops have engaged with more than 500 representatives from campuses in the year.

Centre for Circular Economy on C&D Waste

The programme has been extending technical knowledge support to non-attainment cities (NAC) in the states of West Bengal, Rajasthan, Odisha and Maharashtra in ensuring compliance and adoption of construction and demolition (C&D) waste management planning and dust rules, together with solutions-based inputs into strategy to push circularity in the building sector.

As part of this initiative, CSE developed a national report card on C&D waste management, including data from the PRANA portal (the 'portal for regulation of air-pollution in non-attainment cities', monitors the implementation of NCAP). The report card, comprising factsheets for 11 cities on their C&D waste management ecosystem, will be used to leverage change and for building capacities of city and municipal authorities on C&D waste management.

At the sub-national level, CSE has developed state plans (Odisha), regional plans (Delhi NCR and Kolkata Metropolitan Area), and hyper-local action plans for non-attainment cities of Rajasthan and Gurugram.

CSE's work with the Department of Urban Development and Municipal Affairs and Environment Department, Government of West Bengal has resulted in the state government releasing mandates for obligatory reuse of a certain percentage of construction and demolition waste in all construction; ULBs are also obligated to identify hotspot wards and provide data regarding the volume and estimate the generation of C&D wastes for the next 2-3 years for recycling and reuse. A workshop on the role of ULBs in designing strategies for clean air convened more than 80 participants, including 41 ULBs of the Kolkata Metropolitan Authority region on C&D waste.

Affordable housing for thermal comfort and sustainability

This initiative works with state governments to incorporate thermal comfort requirements in their housing projects, and documents a repository of best practices on traditional material and construction techniques.

As part of the committee of the Ministry of Housing and Urban Affairs, CSE's advocacy made definite contributions to the thermal comfort standards and thermal comfort action plan announced by the Government of India. These standards are targeted for un-conditioned, naturally ventilated buildings by integration of passive design strategies especially in affordable housing.

CSE's advocacy on self-built housing using traditional materials, techniques and skills was recognised, and CSE contributed to the draft National Earthquake Risk Mitigation Programme being developed by National Disaster Management Authority. Also, the Building Materials and Technology Promotion Council (BMTPC) has released a compendium on indigenous innovative building materials and construction technologies, and has come out with a listing of environment-friendly, energy-efficient, cost-effective composite materials/products for low-cost housing, which is in line with CSE's recommendations and advocacy.

Climate-resilient cities and resource efficiency

This component focuses on research and capacity building on making cities climate resilient through resource efficiency/thermal comfort.

CSE's pilot studies were completed in the year for Pune and Kolkata. The programme also developed a methodology to identify heat centres and contributors. This methodology and preliminary findings have been discussed in a series of four regional expert roundtables and conferences and in two trainings, and have engaged more than 550 participants.

In a significant development, CSE has secured a mandate to develop the 'urban habitat framework' for West Bengal. This will be a milestone achievement in the country for the assessment of vulnerability of rapidly transforming urban habitats and solutions needed amidst a changing climate.

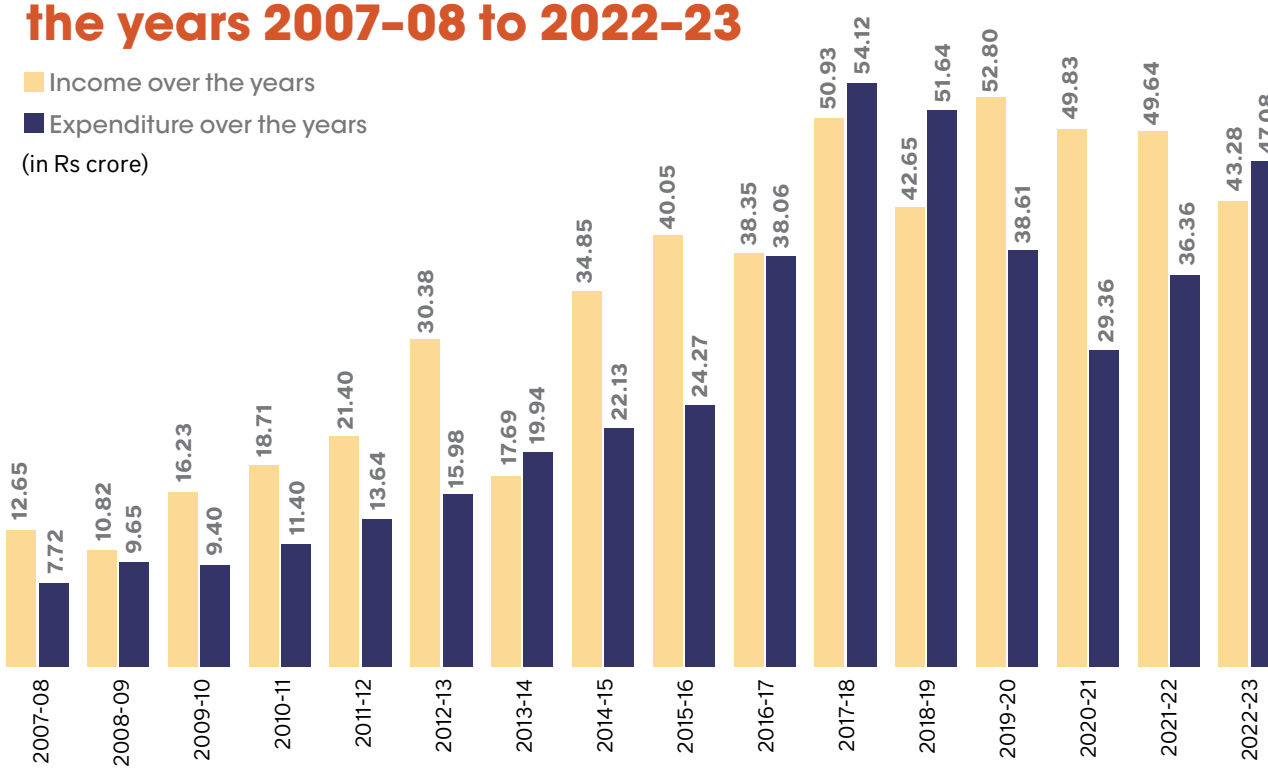
CSE also conducted a progress assessment of the implementation of Energy Conservation Building Code (ECBC 2017) across India, and the results were published in CSE's seminal publication, the State of India's Environment, 2023. This assessed how far the ECBC 2018 rules have been implemented at the state level and at city-level by laws. Although many states had notified the rules, not many cities had instituted relevant bye-laws.

As part of this initiative, CSE conducted a study on low-carbon and district cooling technologies deployed in multiple buildings across the country to document whether alternatives exist and are utilised. The study covered five cases—IIT Gandhinagar campus (district cooling systems and passive down draft); NIIT University, Neemrana (earth air tunnel system); AAETI (direct evaporative, indirect evaporative, and HVAC system 3-stage cooling system); Indraprastha Institute of Information Technology (district cooling system); Gujarat Vidyapeeth (evaporative and earth tunnel). The findings have been presented in four regional roundtables, and an e-book of case studies is underway.

Meanwhile, CSE pushed the 'urban habitat framework', as part of the programme's engagement with the G-20 deliberations, including the Y20 regional consultation which included representatives from different countries. This framework was discussed with a clear focus on housing and cooling action in the backdrop of climate change and disaster resilience. CSE has also engaged policymaking and advisory bodies such as the Institute of Town Planners India (ITPI) and Centre of Excellence identified by the Ministry of Human Resource Development and Ministry of Youth Affairs and Sports.

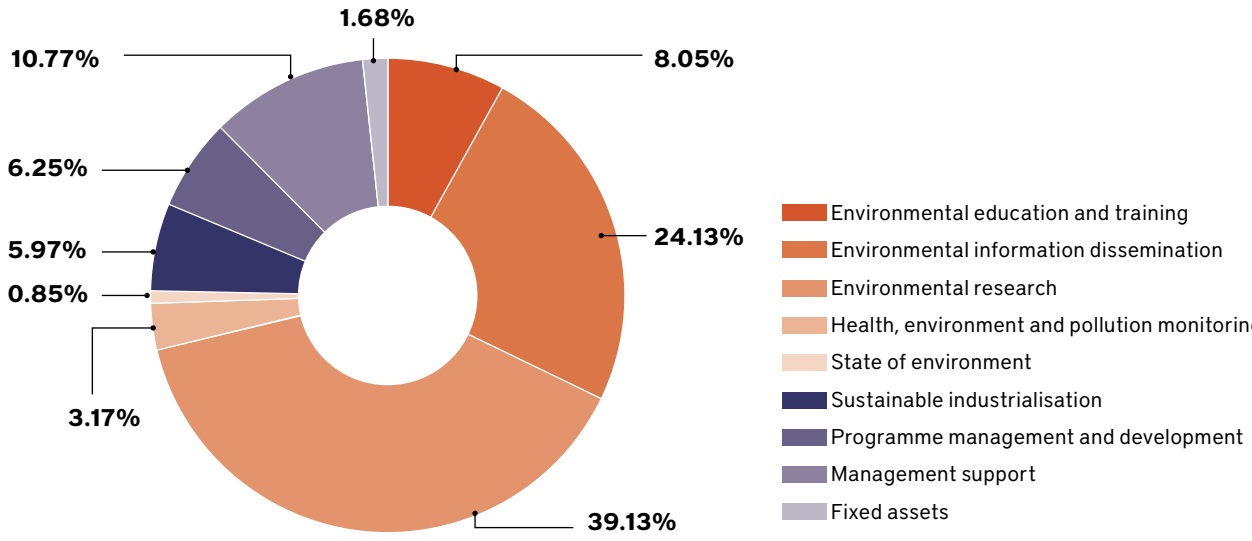
FINANCIAL REPORT (2022-23)

Income and expenditure over the years 2007-08 to 2022-23



Project-wise expenditures

FY 2022-23 (% of total expenditure)



List of donors 2022–23

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 fur Entwicklungshilfe e. V.

New Venture Fund

Royal Danish Embassy

Clean Air Fund

National Mission for Clean Ganga, Govt. of India

National Jal Jeevan Mission, Govt. of India

Dr. Kamla Chowdhury Endowment

Individual donors

Siddhartha Goel | Polash Mukerjee | Achal Anand | Vinay Majithia | Shakti Singh | Sumantra Banerjee | E.V.S. Prakasa Rao | C A Vijaya Sarathy | Ajay Vaibhav Sharma | Rohit Khattar | Medini Baruah | Hussain Varawalla | Bhanumurti K | Abhishek Kumar Singh | Rajesh Joshi | NV Joshi | TS Mahadevan | Perez Yeptho | Kapil Kumar Sen | Siddhant Agrawal | Subhendu Ghatak

Annexures

CSE KEY OUTPUTS (FY 2022-23)

Clean air and sustainable mobility programme

PUBLICATIONS

- Report on Decoding state electric vehicle policies: Are they designed for scale and performance (283 downloads)
- Regional clean air strategy plan for Kolkata Metropolitan Area including 41 Urban Local Bodies
- Summary report on Clean Air Action Plan for Kolkata Metropolitan Area
- Odisha: State clean air action plan
- Strategy for implementation of making Bhubaneshwar and Cuttack model electric vehicle cities
- Paper on E-vehicle strategies in Africa and South Asia (37 downloads)
- Nigeria: Guidance framework for CNG programme (27 downloads)
- Report on industry preparedness for zero emissions mandate (based on commissioned study) (330 downloads)
- Report - Decarbonising Transport: What does it mean for India? (327 downloads)
- Strategy to electrify the three-wheeler segment and passenger and goods vehicles in cities of Odisha (81 downloads)

TRAINING PROGRAMMES

Onsite Trainings:

- Onsite training on NCAP: Framing of strategies and targets for State and Micro Action Plans for air quality improvement in cities (1) 43 Pax/Female 0
- Onsite training on NCAP: Framing of strategies and targets for State and Micro Action Plans for air quality improvement in cities (2) 63 Pax/Female 8
- Onsite training on Air quality monitoring and framing of targets and strategies for State and Micro Action Plans for implementation under NCAP 25 Pax/Female 20
- Onsite training on NCAP with focus on air quality monitoring and data analytics 50 Pax/8 Female
- Onsite training on Revamping on-road vehicle emissions management in cities 43 Pax/ Female 16
- Onsite training: Orientation workshop and exposure visit on Advanced monitoring of emissions from on-road vehicles: prospect of remote sensing measurements in Indian cities 20 Pax/Female 10
- Onsite training on revamping parking management and accessibility in cities 18 Pax/ Female 17
- Onsite training workshop and exposure visit on Clean air action planning strategies 29 Pax/ Female 7

Online Trainings:

- Strategies for on road emissions management 40 Pax/20 Female

MEETINGS, SEMINARS, WEBINARS

- CSE-RSPCB Joint multi-sector stakeholder orientation workshop for implementation strategies for state clean air action plan 48 Pax/ Female 5
- National level workshop on fiscal strategy to improve financial sustainability of bus services in India 32 Pax/ Female 7
- Experience sharing workshop for state bus transport undertakings on e-buses deployment strategies in cities (Ahmedabad) 46 Pax/ Female 5
- Workshop: Guidance on electrification of autorickshaws 45 Pax/ Female 10
- Roundtable on tropical Indian EV battery technology (A Dept of Science and Technology collaboration project 20 Pax/ Female 8
- Roundtable on industry preparedness for zero emissions mandate 38 Pax/ Female 13
- Pan-Africa meeting on air quality, electric vehicles/scrappage, bus transport 38 Pax/ Female 11
- Pan-Africa/Asia meeting on bus transport -best practice sharing 40 Pax/ Female 10
- Knowledge sharing meeting on emissions standards roadmap and alternative fuel policy (including CNG and electrification) in Nigeria 36 Pax/ Female 12
- Online meeting with Ethiopian EPA on national air quality roadmap and next steps 3 Pax/ Female 1
- Stakeholder workshop for finalization of State Clean Air Action Plan in Odisha 70 Pax/ Female 12
- Stakeholder consultation meeting on mobility practices of ULBs in West Bengal 94 Pax/ Female 19

Urban Water—Waste Management programme

PUBLICATIONS

- Practitioner's guide: Decentralised wastewater management
- Practitioner's guide: Urban lake management
- Handbook: Planning and designing water-sensitive cities for the Ganga basin
- Urban stormwater management: Potential and challenges
- Assessment of co-treatment potential in Ganga basin towns of Uttar Pradesh
- Handbook: Planning and designing water-sensitive cities for the Ganga basin
- Project booklets: Chunar and Bijnor FSTPs
- Septage management for citywide inclusive sanitation (CWISE) in Uttar Pradesh
- Septage management in Jhansi Town
- Septage management in Chunar Town
- Septage management in Bijnor Town
- Operation and maintenance cost of FSTPs in Uttar Pradesh
- Ease of septage management in Uttar Pradesh
- Lake Victoria: Roadmap for water quality management in Mwanza, Tanzania
- Economics of desludging based on study of desludging models in Uttar Pradesh
- State model Faecal sludge, septage and wastewater management bye-laws
- Updated status on the FSSM plants in Uttar Pradesh (as on January 2023)

WORKSHOPS/ KNOWLEDGE CONCLAVES

- Knowledge Conclave: CSE-NMCG annual conclave on making Ganga basin cities water sensitive for improved river health and flows (March 15, 2023) - 80 pax.
- State-level workshop on the status of FSSM plants in Uttar Pradesh
- National consultation workshop: Path towards citywide inclusive and responsible sanitation services and inauguration of 'Super 59' (part I) ULBs: FSSM Bye-laws and economics of desludging services
- National workshop: World Water Day and inauguration of 25 FSTPs and 10 co-treatment plants
- Consultation workshop: Emerging priorities for water, waste water and sanitation - 43 pax
- Online consultations (3 nos.): Global South water, wastewater and sanitation learning initiative
- Webinar on World Toilet Day: Conversation with Prof Dr Jack Sim (with Depinder Kapur) – 83 people attended- 124 attended through live streaming
- WSUDP for climate resilience (August 25, 2022)
- Urban groundwater management (September 6, 2022)
- WSUDP for urban water bodies (October 28, 2022)
- Used water management for India (December 6, 2022)

EXPOSURE VISITS

- Field Exposure Visit: State Government/ ULB Officials to Odisha (Aug 4-6, 2022)
- Exposure visit of UP officials to CWIS work in Tamil Nadu – a total of 36 high-level government officials participated in these visits

TRAINING PROGRAMMES

Onsite training

- Training Module: Operations and Maintenance of FSTPs - 35 pax. attended
- O&M of FSTPs and co-treatment plants - 31 pax.
- Effective faecal sludge and used water management - 40 pax.
- River-cities and their action plans - 17 pax.
- Decentralised wastewater management and local reuse - 28 pax.
- Training of trainers on water and wastewater - 14 pax.
- Training of trainers on water and climate change resilience - 14 pax.
- Urban groundwater management
- WSUDP: Rain/stormwater harvesting at different scales
- DWWTS
- Urban lake management (Nov 22-25, 2022)
- Preparation for SFDs and faecal sludge and septage management - (4 batches Feb. 6 – 16, 2023)

Online Training

- 'Mainstreaming SFD and citywide sanitation planning - 40 pax.
- Planning and implementation of deep row entrenchment (240 ULBs attended)
- Effective measures for urban flooding and groundwater management (on 'green infrastructure') – 45 pax.
- Urban Groundwater Management (June 21 - July 1, 2022)
- WSUDP: Basics of Rain/ stormwater harvesting (August 03 - 20, 2022)
- Urban Lake Management (September 28- October 14, 2022)
- DWWTS (Nov 2-16, 2022)
- Water use efficiency and conservation (March 17-28, 2023)

TRAINING MODULES

- Residential course on Groundwater Management
- Online course on Groundwater Management
- Online course on Water Efficiency and Conservation

NEWSLETTERS

- Quarterly collateral on amount of faecal sludge treated in front runner cities of Uttar Pradesh.

- Bimonthly newsletter of School of Water and Waste

TECHNICAL SUPPORT

- Sasur Khaderi lake rejuvenation and pre-feasibility report
- DPR review (Dalmau)
- Technical session in Lucknow on the DPR preparation
- Research conducted to collect the case studies for C-Gins in Pune
- Technical support to DoUD, Uttar Pradesh and NMCG

Rural Water—Waste Management programme

PUBLICATIONS / AUDIO-VISUALS

- Big Change is Possible – Best practices in water supply and sanitation in India
- Ground report: Tanzania's sanitation battle is just half won
- Managing water resources key for Tanzania's sanitation fight
- Random sprawl-1-15 Feb, 2023, Volume- 31, No.18, Page 20
- Monumental waste-16-28 Feb,2023, Vol. 31, No. 19, Page No. 20

TRAINING PROGRAMMES

Onsite Trainings (National)

- District Level Planning for FSM in rural area, April 26 - 30, 2022, Total Participants =23 (Female 1)
- District Level Planning on FSM, June 07 – 11, 2022, Total Participants= 27 (Female 2)
- District Level Planning on FSM (September 20 - 24, 2022) Total pax. 21 (Female 4)
- Onsite and offsite management of faecal sludge for SBM G officials (Nov. 22-25, 2022). Total pax. 32 (Female 4)
- Managing greywater for SBM G officials (Jan. 17-20, 2023). Total pax. 21 (Female 4)
- Managing water and wastewater in rural regions of India (Jan. 31-February 03, 2023). Total pax. 22 (Female 5)
- Managing plastics in rural areas (Feb. 7-10, 2023). Total pax. 26 (Female 7)
- Rainwater harvesting, groundwater recharge and water conservation for drinking water supply (Aug. 2-4, 2022). Total pax. 37 (Female 5)
- Greywater Management in Rural Areas (Sept. 14-16, 2022). Total pax. 44 (Female 4)
- Greywater Management in Rural Areas (Nov. 2-4, 2022). Total pax. 33 (Female 4)
- Rainwater harvesting, groundwater, recharge and water conservation for drinking water supply (Dec. 20-22, 2022). Total pax. 38 (Female 6)

Onsite Training (Global)

- Workshop and meeting in Tanzania on groundwater, wastewater and faecal sludge management (July 11 - 12, 2022), Total pax. 20 (Female 10)
- Training and exposure visit for senior officials of Uganda, Tanzania and Nigeria to India (Sept. 06 - 10, 2022). Total pax. 12 (Female 4)

Online Trainings:

- Online training on groundwater. Wastewater and faecal sludge management. Pan Asia Africa (Oct. 7-21, 2022). Total pax. 61 (Female 18)
- Online training on groundwater. Wastewater and faecal sludge management. Pan Asia Africa (Dec. 1-15, 2022). Total pax. 61 (Female 17)

MEETINGS,SEMINARS, WEBINARS

- Workshop(online) with alumni to understand state level progress on FSM in rural areas (Sept. 28, 2022). Total pax. 43 (Female 6)
- Workshop with alumni from the different states to understand their progress on source sustainability; monitoring and greywater management (March 1, 2023) Total pax. 67 (Female 21)
- Release meeting of CSE publication, 'Big Change is Possible' (Aug. 17, 2022). Total pax. 84 (Female 30)

Renewable Energy programme

PUBLICATIONS

- VOL 1: Mini-Grids a Just and Clean Energy Transition
- VOL 2: Mini-Grids a Just and Clean Energy Transition
- Resurgence of Offshore Wind - Technical Report on Developing India's Offshore Wind Energy Systems
- Repowering Wind Farm - Maximizing Energy Yield from Existing Site Layouts
- Greening India's Energy Mix with Compressed Biogas (CBG)

MEETINGS, SEMINARS,

WEBINARS

- Webinar: Mini-Grids in the Global South
- Webinar: A Virtual Consultative Round Table MINI-GRIDS IN INDIA
- Webinar: Repowering Wind Energy in Tamil Nadu
- Webinar: Repowering wind energy

in Tamil Nadu - Challenges and options for wind energy developers

NEWSLETTER

"● The New Age Energy" - Fortnightly Digest CSE's fortnightly RE bulletin has over 9000 subscribers, and covers the new energy transitions taking place around the globe.

DOWN TO EARTH ARTICLES ON RENEWABLE ENERGY

- Myanmar, India's gateway to ASEAN, can solve its power issues by shifting to renewables
- More domestic renewable energy generation, regional ties can help Thailand's green transition
- Energy storage has a vital role to play in the green transition of BIMSTEC countries
- BIMSTEC region can provide green, affordable energy access to all
- India, Japan to improve bilateral cooperation towards clean energy transition
- Biogas digestate: This high-value byproduct deserves more attention
- Can India's G20 Presidency tackle climate change while ensuring energy access, security and transition?
- Budget kick: Keep these factors in mind while setting up a Bio-CNG plant
- Here is how demand aggregation can improve rooftop solar installation in India
- How South Asia's massive renewable energy potential can boost green hydrogen production
- Mini-grids: Africa's new tool to improve energy access, empower livelihoods
- Improvising power trade in South Asia can ease renewable energy access in the region
- 2022: Looking back to move ahead for clean energy transitions
- Here are some new trends in electrolyser tech to catalyse green hydrogen production
- Innovative finance mechanisms can scale up clean cooking
- Policy enablers needed to strengthen India's Bio-CNG sector
- India's renewable shift: Why re-training the coal-dependent society is key
- Closing the gender gap in clean energy transitions
- Uttar Pradesh's Bioenergy Policy: Good on paper, execution may be tricky
- India's evolving carbon market: Eye on policies for uniform emissions trading, Net Zero
- Why producing CBG, LBG, hydrogen, methanol from biogas can be beneficial
- India's green push for second-generation bioethanol
- Achieving green steel: How India can bridge the gaps to decarbonise the sector
- India's renewable energy race: MP, UP will take more than 50 years to meet 2022 target at current pace
- Paving the way to sustainable energy generation with microgrids
- Will algae biofuels become viable?
- India's clean cooking transition: Why development financial institutions play major role
- Recycling solar panels needs boost from Indian policymakers
- Decentralised renewable energy vital for strengthening Jharkhand's health sector
- Germany's emissions-free trains: Is hydrogen fuel really a better alternative for transport?
- India's wind energy sector struggles despite SECI's oversubscribed bids
- Role of hydrogen as a clean fuel for sustainable mobility
- All you need to know about the energy conservation bill
- Europe hypocrisy: Amid shift to coal, what about climate goals?
- Electric vehicles have a dark side too: Blood batteries and child labour

Climate Change programme

SELECT DOWN TO EARTH

ARTICLES

- Cover story on loss and damage: https://www.cseindia.org/special-edition-loss-and-damage-11471
- Cover story on climate and trade: https://www.cseindia.org/a-new-order-of-trade-11637

IPCC REPORT COVERAGE

- https://www.downtoearth.org.in/blog/climate-change/six-takeaways-from-ipcc-ar6-report-long-term-benefits-of-cutting-emissions-today-outweigh-costs-82213
- https://www.downtoearth.org.in/news/climate-change/climate-crisis-6-key-messages-from-ipcc-synthesis-report-88348

UNFCCC AND COP COVERAGE

- https://www.downtoearth.org.in/news/climate-change/fulfilling-cop26-promises-can-limit-global-warming-to-2-c-study-82550
- https://www.downtoearth.org.in/news/climate-change/least-developed-countries-want-major-emitters-g20-to-increase-climate-efforts-83057
- https://www.downtoearth.org.in/news/climate-change/bonn-climate-conference-begins-with-tense-stand-off-on-loss-and-

damage—83171

- https://www.downtoearth.org.in/news/climate-change/bonn-climate-conference-glasgow-colonial-pact-shifts-burden-of-climate-change-to-developing-countries-say-parties-83278
- https://www.downtoearth.org.in/news/climate-change/bonn-climate-conference-loss-and-damage-discussions-nothing-but-talk-shop—83315
- https://www.downtoearth.org.in/news/climate-change/cop27-will-be-implementation-cop-egypt-cop27-presidency-83695
- https://www.downtoearth.org.in/news/climate-change/india-s-updated-climate-pledge-to-paris-agreement-gets-union-cabinet-nod-84138
- https://www.downtoearth.org.in/blog/climate-change/loss-and-damage-2022-pakistan-floods-heighten-need-for-climate-reparations-84721
- https://www.downtoearth.org.in/interviews/climate-change/run-up-to-cop27-john-kerry-is-scared-of-the-floodgates-of-litigations-on-accepting-loss-and-damage—85662 https://www.downtoearth.org.in/blog/climate-change/cop27-switzerland-wants-major-emitters-and-big-developing-economies-to-do-more-on-mitigation-85873
- https://www.downtoearth.org.in/blog/climate-change/five-big-disagreements-on-loss-and-damage-as-cop27-clock-ticks-on-86027
- https://www.downtoearth.org.in/news/climate-change/cop27-clear-battle-lines-drawn-on-loss-and-damage-as-rich-try-to-divide-the-poor-86070
- https://www.downtoearth.org.in/news/climate-change/cop27-will-fail-because-of-the-us-eu-and-global-north-not-the-developing-world-86083
- https://www.downtoearth.org.in/news/climate-change/cop27-was-a-win-for-the-loss-and-damage-cause-here-is-what-transpired-and-the-road-ahead-86089

GLOBAL CLIMATE POLICY

- https://www.downtoearth.org.in/blog/climate-change/us-new-climate-bill-the-good-the-bad-and-the-fossil-addicted-84275
- https://www.downtoearth.org.in/news/climate-change/us-japan-others-to-fund-indonesia-s-transition-to-clean-energy-86007
- https://www.downtoearth.org.in/news/climate-change/eu-s-carbon-border-tax-is-it-regressive-and-protectionist-or-an-incentive-for-global-decarbonisation—86681
- https://www.downtoearth.org.in/news/climate-change/climate-hypocrisy-germany-s-coal-fuelled-power-sector-more-polluting-than-india-china-currently-86306
- https://www.downtoearth.org.in/news/climate-change/us-emissions-up-1-3-in-2022-despite-coal-displacement-by-gas-renewables-report-87101
- https://www.downtoearth.org.in/blog/climate-change/eu-follows-us-by-boosting-its-domestic-green-industry-support-outcome-for-global-south-uncertain-88323

Industrial Pollution programme

PUBLICATIONS

- Report on how to reduce GHG emissions from iron and steel sector (No. of downloads- 641)
- Report on best practices in Foundry sector in Rajasthan- Submitted to Rajasthan State Pollution Control Board
- Report on status of EIA/need for strategic EIA and way ahead: African and South Asian countries (No. of downloads- 3352)
- Report on Assessment of non-hazardous waste in Rajasthan: Vishwakarma Industrial Area in Jaipur - Submitted to Rajasthan State Pollution Control Board
- Report: Development of Environmental Management Strategy Towards Sustaining Ecological Integrity of Lake Victoria (No. of downloads- 2432)
- Report on Biomass Co-firing preparedness by Indian TPPs: Understanding the issue of availability (No. of Downloads 870)
- Report on Implementation analysis (availability and applicability) of biomass as a fuel in industries in Alwar district (No. of downloads- 75)
- Factsheet: coal vs gas
- Report on stone crusher in Pune, Maharashtra (No. of downloads- 260)
- Finalization and release of Terms of reference for industrial sector, Tanzania (No. of downloads- 693)
- Finalization and release of Terms of reference for Mining project (No. of downloads314)
- Lake Victoria: Roadmap for Water Quality Management in Mwanza, Tanzania No. of downloads- 691)

TRAINING PROGRAMMES

Onsite Training

- Training on EIA (Neemli Rajasthan, 1- 4 April, 2022) 17 males, 8 females
- How to develop an air quality management plan for industrial areas? (Neemli Rajasthan, 5- 8 April, 2022) 23 males, 7 females
- Tools for pollution management in small and medium scale industries (Neemli Rajasthan, 26- 29 April, 2022) 23 males, 8 females
- Training on low carbon pathway

(Neemli Rajasthan, 23- 26 August, 2022) 21 males, 8 females
- Training on EIA (Neemli Rajasthan, 13- 16 September, 2022) 12 males, 11 females
- Developing Air Quality Management Plan for Industrial Areas (Neemli Rajasthan, 13- 16 December, 2022) 21 males, 03 females
- Training on CEMS (Neemli Rajasthan, 18- 21 January, 2023) 18 males, 08 females
- Global training on Strengthening EIA regime (Neemli Rajasthan, 14 -17 February, 2023) 5 males, 02 female
- Training on EIA (Neemli Rajasthan, 14-17, February, 2023) 21 males, 07 female

Online Training
- Training on Environmental law (17 -28 May, 2022) 140 participants (69 males, 71 females)
- Training on water audit (14 -27 June, 2022) 197 participants (155 males, 42 females)
- Training on EIA (26 July - 4 Aug, 2022) 102 participants
- Training on Environmental Law (15 – 24 Nov, 2022) 84 participants
- Training on EIA (06 -15 December, 2022) 97 participants (62 males, 35 females)
- Training on CEMS (22 - 30 Nov, 2022) 197 participants (57 males, 11 females)
- Training on Water audit (17 -30 Jan, 2023) 159 participants (122 males, 37 females)
- Training on low carbon pathway (14 – 26 Feb, 2023) 159 participants (50 males, 30 females)

MEETINGS, SEMINARS, WEBINARS
- Seminar on pollution control strategy for small and medium scale industries (May, 2022) 79 participants (71 males, 8 females)
- Seminar on lake Victoria and way ahead (July, 2022) 79 participants (26 males, 6 females)
- Seminar to release report on EIA in Tanzania for Africa (July, 2022) 20 participants (10 males, 10 females)
- Workshop on "Controlling Fugitive Dust Emissions from Stone Crusher and Mineral grinding sector" (Sept, 2022) 13 participants (13 males)
- Webinar on Lake Victoria Oct, 2022, 16 participants (11 males, 5 females)
- Roundtable for non-hazardous waste management in VKIA (Nov, 2022) 17 participants (12 males, 5 females)
- Seminar on iron and steel GHG reduction, February, 2023 54 participants (40 males, 14 females)
- Lake Victoria report release, 40 participants (25 males, 15 females)

Sustainable Food Systems programme

PUBLICATIONS
- ↘ Report: Market Access for Organic and Natural Produce: Case Studies
- ↘ Down to Earth article: Ethnoveterinary medicines in the Indian dairy sector

MEETINGS, SEMINARS, WEBINARS
- National Conclave on Sustainable Food Systems. 59 pax / 8 female
- Training on 'Enabling Transition to Organic/Natural Farming' to build capacity of extension officials as master trainers in select north Indian states. 38 pax /0 female
- Workshop on Development and Implementation of State Action Plans on containment of Antimicrobial Resistance jointly organised with WHO, India. 74 pax/ 22 female
- Webinar on 'Ethnoveterinary medicine: alternative to antibiotics for the dairy sector. 296 pax / 85 female

DOWN TO EARTH ARTICLES
- Organic takeover: How 10,000 farmers of Telangana, Andhra are steering a silent movement
- Bridging Gaps: This Chhattisgarh farmer's collective champions sustainability
- Strategic ally: How an organic food company expanded farm-to-fork philosophy to promote chemical-free practices
- Organic reinforcement: Here's how chemical-free perishables can be promoted
- A question of sales: Natural farming faces challenges in Himachal; here is how
- Millet might: Here is how Odisha can succeed in reviving these cereals lost to the Green Revolution
- Restore by use: Regenerative agriculture can help save water; here is how

Solid Waste Management programme

PUBLICATIONS

- Plastic waste management in Africa: An overview
- SBM Toolkit on Organic Waste Management
- Toolkit on Inorganic Waste Management
- Stakeholder mapping in plastic value chain – The plastic lifecycle
- Toolkit on Legacy Dumpsite remediation
- Finalization of Gurugram BWG report on management of organic waste
- Report on Municipal Solid Waste Management Assessment/road map on Gurugram
- Scoping paper on the key issues/ challenges in Africa based on literature review
- Sanitary Waste Management in India

MEETINGS, SEMINARS, WEBINARS

- Workshop with the Agra Municipal Corporation and petha manufacturers on the Petha Report 18 Pax/Female 0
- National Conclave and Release of report - The Plastic Life-Cycle 300 Pax/Female 120
- PAN-Africa workshop on solid waste management to launch the global forum of cities for circular economy 29 Pax/Female 14
- Workshop with Bulk waste generators representatives for effective waste management (For Hotels and commercial establishments) 67 Pax/Female 4
- Release of two tool kits on biodegradable waste management and non-biodegradable waste management and webinar 55 Pax/Female 15
- Webinar on domestic hazardous waste management 300 Pax/ Female 51
- Round table with the first tranche of Global cities to understand the challenges and discuss the way forward 10 Pax/Female 01
- Webinar and Release of report on Sanitary Waste Management 347 Pax/Female 257
- Release of Report and Symposium on Dumpsite Remediation and Legacy Waste Treatment 55 Pax/Female 15
- State workshop with the urban development department to provide policy inputs for sustainable solid waste management practice 81 Pax/ Female 19

TRAINING PROGRAMMES

Onsite trainings

- CSWAP training of state and ULB officials of Mizoram. 16 Pax/ Female 4
- Planning and Implementation of City Solid Waste Action Plan 86 Pax/Female 3
- State level master trainers on Integrated Solid Waste Management 17 Pax/4
- Planning and Implementation of City Solid Waste Action Plan 14 Pax/Female 5
- Digitalised monitoring and use of AI based technologies for sustainable solid waste management system and Integration of informal sector in waste management value chain 18 Pax/Female 2
- State level master trainers on Integrated Solid Waste Management (including formation of bye-laws) 39 Pax/Female 16
- Economic Sustainability of Solid Waste Management value chain - How to increase revenue and reduce OPEX 43 Pax/Female 6
- Legacy dumpsite remediation and landfill management for city managers 32 Pax/Female 6
- SWM of Zonal officer, Sanitary Inspectors and higher officers in Agra Municipal Corporation 106 Pax/Female 3
- Training for ANN officials to strengthen implementation of sustainable SWM in Agra 123 Pax/Female 2
- 2nd Pan Africa Workshop with Global Forum of Cities for Circular Economy to share best practices, release plastic report and discuss the roadmap for further engagement 29 Pax/ Female 9
- Exposure visit for MCG officials to Agra to learn from Tajganj pilot 09 Pax/Female 0
- Training of state level master trainers on Integrated Solid Waste Management 36 Pax/ Female 12
- Training cum exposure visit to Indore for Zero Waste Cities 5 Pax/Female 0
- Capacity Building of Himachal Pradesh State Pollution Control Board Officials on SBM 2.0 49 Pax/Female 12
- Training of appointed and elected members of local and state level officers/ on SWM with HPPCB 60 Pax/25
- Exposure visit of officials from the City of Leh and Kargil for understanding the management of biodegradable Waste by the Bulk Waste Generators in MCG 11 Pax/Female 2
- Training on Integrated Solid Waste Management with City Officials and other sector players 41 Pax/Female 14

Online Trainings

- Sustainable plastic waste management and EPR 57 Pax/ Female 26
- E-waste management 43 Pax/ Female 15
- Global Forum of Cities on Plastic Waste Management 169 Pax/ Female 59
- Master class for practitioners knowledge building series - implementation of SUP ban 40 Pax/Female
- Integration of informal sector in SWM 54 Pax/Female 0

- Dumpsite remediation and construction and management of sanitary landfill 48 Pax/Female 0
- Dumpsite remediation and construction and management of sanitary landfill 60 Pax/Female 0
- Training on Bio-CNG 35 Pax/ Female 11
- Sustainable organic and inorganic waste management practice 52 Pax/Female 13
- Training on Bio-CNG 62 Pax/ Female 12
- Master Class for practitioners' knowledge building series - Organic waste processing and revenue augmentation 50 Pax/ Female 15
- Master class for practitioners' knowledge building series - approaches to the garbage-free city 127 Pax/Female 52
- EC/ BCC, Source Segregation and capacity building framework for sustainable Solid Waste Management 81 Pax/Female 45
- EC/ BCC, Source Segregation and capacity building framework for sustainable Solid Waste Management 41 Pax/Female 0
- Master class for practitioners' knowledge building series - Source Segregation, IEC/BCC 167 Pax/Female 125
- Master class for practitioners' knowledge building series - Digital monitoring and tracking 165 Pax/Female 140
- Sanitary landfill management and dumpsite remediation for global cities 103 Pax/Female 0
- Material recovery and Integration of informal sector in SWM for global cities 128 Pax/Female 0

Media Resource Centre

MEETINGS, SEMINARS, WEBINARS

- Online Africa Network Media Café for African media 33 Pax/ Female 12
- PRE-COP-27 Online media briefing 102 Pax/Female 36
- Regional Media Briefing Workshop: The Fight Over a Right 54 Pax/Female 13

TRAINING PROGRAMMES

Onsite Trainings

- Manthan 7 (Bhopal, 08-08-2022 - 09-08-2022) 35 pax / 0 female

Online Trainings

- MANTHAN 6 - for Hindi media (online, 07-05-2022 - 07-05-2022) 33 pax / 7 female
- MANTHAN 8 - Hindi media (AAETI, 18-02-2023 - 18-02-2023) 43 pax / 9 female
- Solid Waste Management in India's Northeast (Webinar, 28-05-2022 - 28-05-2022) 40 pax /15 female

Sustainable Buildings and Habitats programme

PUBLICATIONS

- ↘ Wisdom to Build: A Compendium of locally evolved materials and techniques for Sustainable self-built housing
- ↘ Sustainable Self-Built Housing: Reinventing Local Material, Techniques and Skills

TRAINING PROGRAMMES

- Training on 'Planning and Designing for climate resilient built environment' (Onsite, 06-9 Dec 2022) 245 pax / 98 female
- Urban and regional planning for air pollution and climate change mitigation: Reshaping space for new generation solutions' (Onsite, 24 Feb 2023) 230 pax / 73 female
- Residential Training on 'Greening the Construction Sector – For C&D waste management and dust control' at AAETI (Onsite, Feb 28 - March 3rd) Pax 30/ 7 females
- A cradle-to-cradle approach with focus on C&D waste management and dust control (Onsite, Nov 15-18 2022) Pax 30/ 0 females
- Training on Sustainable building design processes conducted at AAETI (Onsite, Nov 7-10 2022) Pax 47 / 26 females
- Guiding self-built housing towards sustainability and thermal comfort (July 12-15 2022) Pax 25, 12 females

MEETINGS, SEMINARS, WEBINARS

- National Workshop for Experience Sharing: Role of ULBs in designing strategies for clean air (Onsite, Feb 16-17 2023) pax 80/ 19 females
- Workshop- South region - Resource Efficiency in Educational Campuses (Online, 20 Sept.2022) 210 pax / 115 female.

- Workshop- North region - Resource Efficiency in Educational Campuses (Online, 23 Sept 2022) 257 pax / 117 female
- Regional Conference on 'Liveability in Cities: Focus on Cooling Action, Bhubaneshwar, Odisha (Onsite, 24 Jan 2023) (140) 80 pax / 19 female
- Regional Conference on 'Liveability in Cities: Focus on Cooling Action' (Onsite, 13-14 Feb 2023) (166) 131 pax / 71 female
- State-level Roundtable cum conference on Climate Appropriate Self-Built Housing, Kolkata, West Bengal (30 July 2022) 59 pax / 25 female
- State-level roundtable cum conference on Climate Appropriate Self-Built Housing, Bhubaneshwar, Odisha (28 July 2022) 63 pax / 20 female
- Workshop on indigenous and climate-appropriate building technologies (as part of Azadi Ka Amrit Mahotsav (06 June 2022) 75 pax / 3 female
- Stakeholder Meeting: State Action Plan for Odisha: Building enhanced multi-sector Strategies (Online, 16-24, 2023) 52 pax / 22 female

Environment Education programme

PUBLICATIONS

↘ Gobar Times: A supplement for the young and curious
↘ Young environmentalist: Online portal

MEETINGS, SEMINARS, WEBINARS

- SWM workshop for teachers 69 Pax/Female 51
- Convocation for climate course trainees 20 Pax/ Female 11
- Deep dive in HP - Exposure visit for 30 HP teachers to AAETI 28 Pax/Female 8
- Deep dive in HP – Second Science Fair on RE (on YE) 64 Pax/Female 20
- GSP RE: Workshop (2) Deep dive in schools of HP 28 Pax/Female 8
- Air Pollution: YE event (Quiz Contest) 592 Pax/ Female 186
- Online Workshop 1 on air pollution 140 Pax/Female 90
- GSP Audit Awards Ceremony 2021-22 (Online) 525 Pax/Female 147
- Audit 2022-23 GSP school awards ceremony 270 Pax/175
- Orientation workshop for Navodaya Vidyalaya Teachers 31 Pax/Female 22
- Orientation workshop for Navodaya Vidyalaya Teachers (TGT) Science 37 Pax/Female 18
- Orientation workshop for Navodaya Vidyalaya Teachers (TGT) English 37 Pax/Female 20
- CSE Annual Climate Change Quiz 34 Pax/Female 16

TRAINING PROGRAMMES

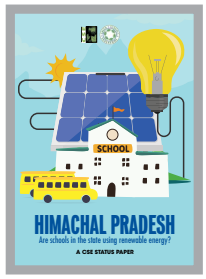
Onsite Trainings

- Deep dive in HP – Orientation workshop for 30 schools with HIMCOSTE 45 Pax/Female 11
- Deep dive in schools of HP 28 Pax/Female 8
- GSP Workshop with Sikkim ENVIS 160 Pax/Female 76
- CSE Session on water management in schools at Water Fest 2023 organised by PondyCAN, Puducherry 24 Pax/Female 15

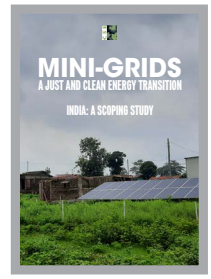
Online Trainings

- Climate Change: Launch of training programme for teachers 37 Pax/Female 23
- Climate Change for teachers, Continuation 27 Pax/ Female 23
- Workshop for Church of South India Schools Pax 97/ Female 33
- Climate Change for teachers 39 Pax/Female 25
- Climate Change for teachers, Continuation 39 Pax/ Female 29
- Orientation session for Satya Bharti Schools on GSP Audit 58 Pax/Female 17

CSE Publications (2022–23)

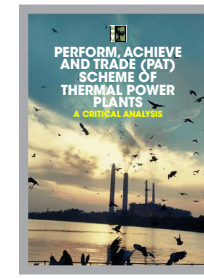


Status of Renewable Energy in Himachal Pradesh



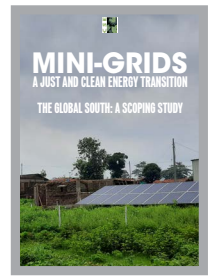
Mini-grids: A Just and Clean Energy Transition (vol 1)

Petha Waste Management in Agra City



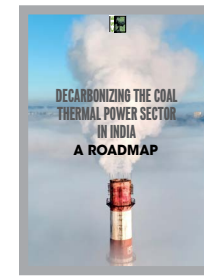
PAT Scheme for Thermal Power Plants

Compendium of Clean Air Action in Africa



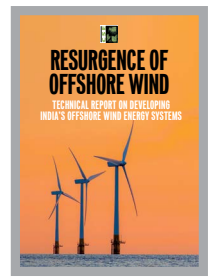
Mini-grids: A Just and Clean Energy Transition (vol 2)

Greening India's energy mix with compressed biogas

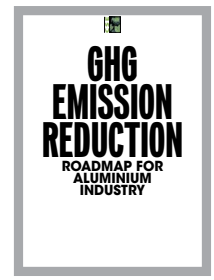


Decarbonizing the Coal Thermal Power Sector in India: A Roadmap

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



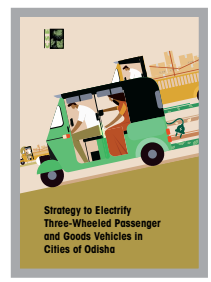
Resurgence of Offshore Wind: Technical Report on India's Offshore Wind Energy



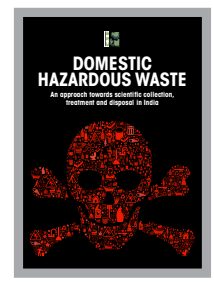
Aluminium

Decarbonizing cement sector in India A roadmap

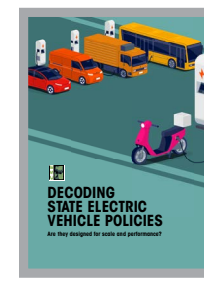
Sanitary Waste Management in India: Challenges and Agenda



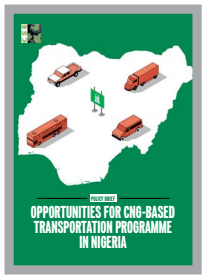
Strategy to electrify the three-wheeler segment and passenger and goods vehicles in Cities of Odisha



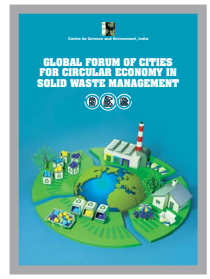
Domestic Hazardous Waste Management in India



Decoding state electric vehicle policies

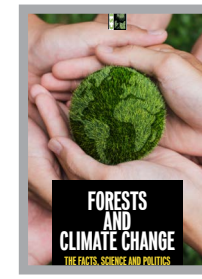


Opportunities for CNG-based Transportation Programme in Nigeria



Global Forum of Cities for Circular Economy in Solid Waste Management

Remote monitoring of emissions from on-road vehicles: A Primer



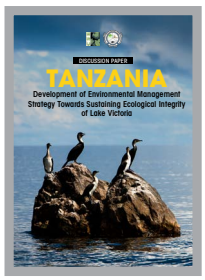
Forests and Climate Change: The Facts, Science and Politics

EIA: Evaluation of legislations in countries of Africa and South Asia

Towards a Zero-emissions Mandate Policy: Analysis of Stakeholder Perception

Septage Management for City-Wide Inclusive Sanitation in Uttar Pradesh

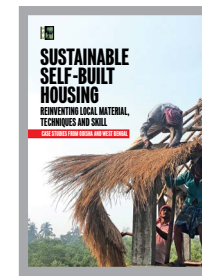
Managing Solid Waste in Africa: A scoping study to prepare the ground for future action



TANZANIA: Development of Environmental Management Strategy Towards Sustaining Ecological Integrity of Lake Victoria

Assessment of Non-Hazardous Waste: Vishwakarma Industrial Area, Jaipur

Big Change Is Possible: Best Practices in Water Supply and Sanitation in India



Reinventing Local Material, Techniques and Skills for Sustainable Self-Built Housing

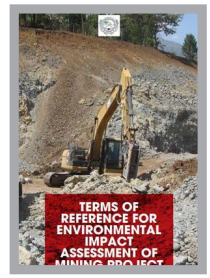
Preparing City Solid Waste Action Plan (CSWAP) under SBM 2.0: Managing Biodegradable Waste

Toolkit For Preparing City Solid Waste Action Plan (CSWAP) Under SBM 2.0: Managing Non-Biodegradable Waste

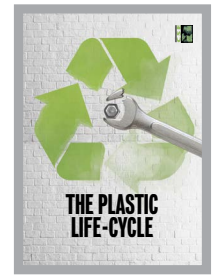
Legacy Waste Management and Dumpsite Remediation to Support Swachh Bharat Mission 2.0

Improving the Environmental Performance of the Foundry Sector: A Case Study of Vishwakarma Industrial Sector

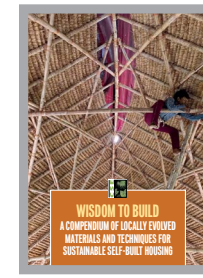
Forum of Cities that Segregate: A Brief Assessment



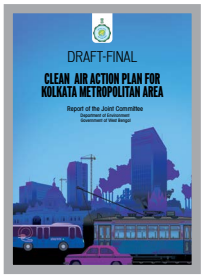
Terms of Reference for Environmental Impact Assessment of Mining Project



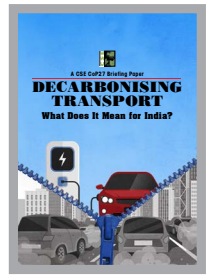
The Plastic Life Cycle



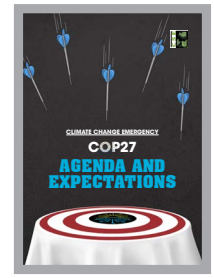
Wisdom to Build: A Compendium of Locally Evolved Materials and Techniques for Sustainable Self-Built Housing



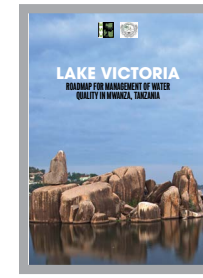
Clean Air Action Plan for Kolkata Metropolitan Area: Report of the Joint Committee



Decarbonizing transport: What Does It Mean for India?

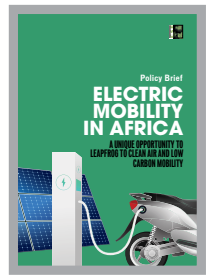


COP 27 Agenda and Expectations



Lake Victoria: Roadmap for Management of Water Quality in Mwanza City, Tanzania

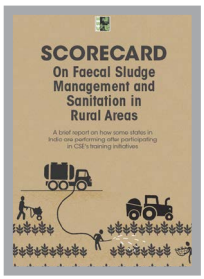
Plastic Waste Management in Africa: An Overview



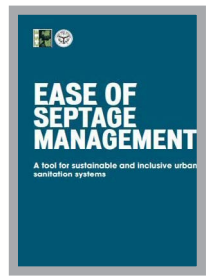
Electric Mobility in Africa: A Unique Opportunity to Leapfrog to Clean Air and Low Carbon Mobility

Refuelling Delhi-NCR: A Study on Challenges face by Industries in Transitioning to Cleaner Fuels in Alwar District

Market Access for Organic and Natural Produce: Case Studies

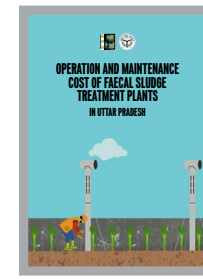


Rural water team scorecard



Ease of Septage Management: A tool for sustainable and inclusive urban sanitation systems

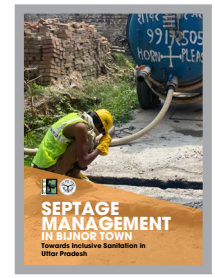
Status of Biomass Co-firing in Coal Thermal Power Plants in Delhi NCR



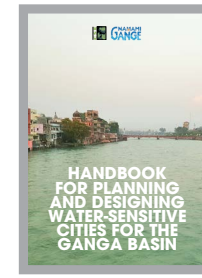
Report on Study of the Operation and Maintenance Cost of Faecal Sludge Treatment Plants in Uttar Pradesh

Septage Management Challenge in Chunar Town: Towards Inclusive Urban Sanitation In Uttar Pradesh

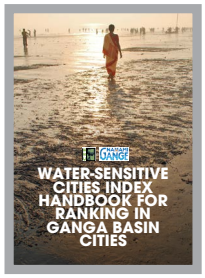
Septage Management in Jhansi Town: Towards Inclusive Sanitation in Uttar Pradesh



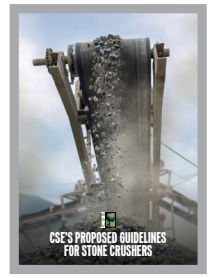
Septage Management in Bijnor: Towards Inclusive Sanitation in Uttar Pradesh



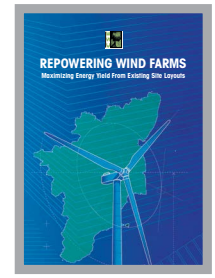
Handbook for Planning and Designing Water-Sensitive Cities for the Ganga Basin



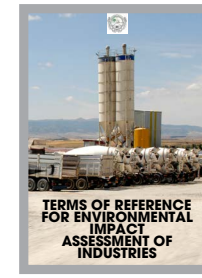
Water-sensitive Cities Index Handbook for Ranking in Ganga Basin Cities



Status of Stone Crushers in Pune, Maharashtra



Repowering Wind Farms: Maximizing Energy Yields from Existing Site



Terms of Reference for Environmental Impact Assessment of Industries

FACTSHEETS

C&D Waste Management series

COP 27 series

Media presence (April 2022–March 2023)

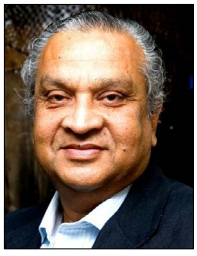
CSE coverage in Print, Online and Electronic news media

Team	Total no. of media clips	National	Regional	Global/ Africa
Clean Air and Sustainable Mobility	356	290	43	23
Urban Lab	987	669	101	217
Climate Change	91	63	4	24
Opinion pieces by CSE staff	98	74	6	18
Down To Earth English +Web	320	229	49	42
Down To Earth Hindi	6	1	5	-
Environment Education	30	11	18	1
Industrial Pollution	86	74	08	4
Municipal Solid Waste	160	121	16	23
Renewable Energy	23	20	1	2
Rural Water-Waste Management	19	11	8	0
Sustainable Food Systems	94	80	10	4
Sustainable Habitat	30	27	3	0
Urban Water-Waste Management	31	15	16	0
Miscellaneous	3	2	1	0
Total	**2336**	**1688**	**290**	**358**

News media visibility

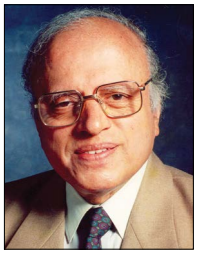
CSE's media presence (mentions in print, online and electronic (TV) platforms of CSE research, or CSE staff used as sources for stories) has improved. As against CSE mentioned 2177 times in media clips last year, in 2022-23, CSE appeared in 2336 media clips (an increase of more than 7per cent). This includes CSE research or advocacy mentions in national (1688), regional/sub national/ regional language media (290) and international (358) media coverage. *Importantly, international coverage has almost doubled from last year, up from 195 to 358 media mentions, an increase of 84per cent.*

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.

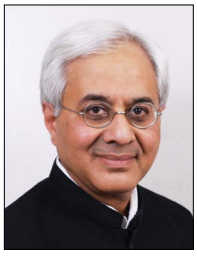


M.S. Swaminathan (Emeritus Chairperson)

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 Direcor 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 (Treasurer)

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 (Member)

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.

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E-mail: cse@cseinida.org Website: www.cseindia.org