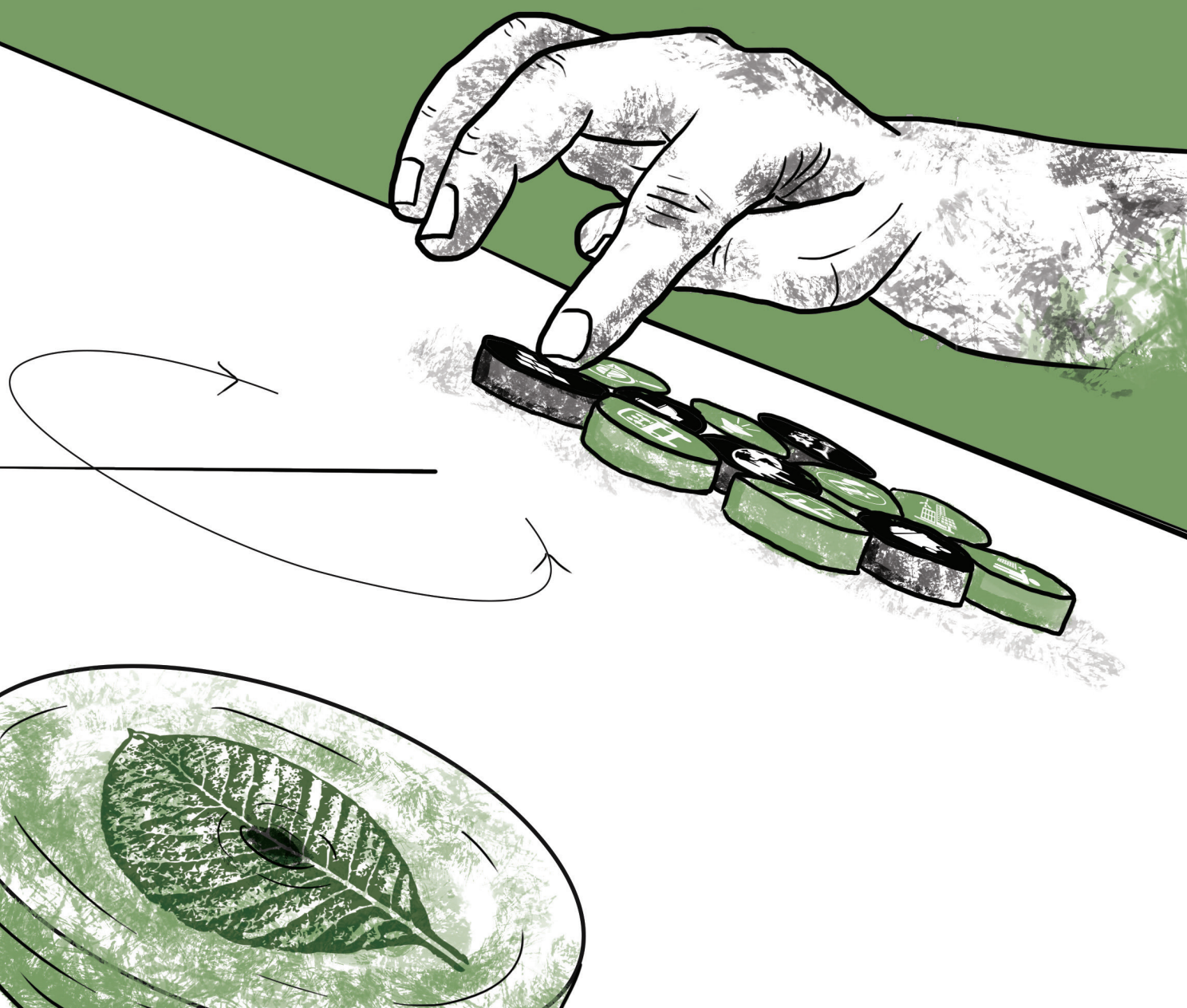
CENTRE FOR SCIENCE AND ENVIRONMENT

2019–20
ANNUAL REPORT
Knowledge-Based Activism



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OUR AGENDA DURING AND AFTER THE PANDEMIC

With the COVID-19 pandemic, it is clear that we have entered into unknown territory, with many uncertainties. We have been asking ourselves what this means in terms of new normal for work. It is clear we need a strategy for work in COVID-19 times, and for after, to understand how current programmes can contribute better and how we can as an institution connect publicly to re-emphasize our work.

In the short term, we need to keep work going and also keep CSE staff and their families safe. We also need to respond to the crisis and contribute—in a targeted manner—to those most in need. On human r s in getting back to office, with safety measures in place.

I am happy to report that CSE has remained 90–100 per cent productive over the past two months since the lockdown was imposed. Teams have rescheduled work to focus on research that can be done off-site. We are investing time and some resources in taking our trainings online, and are looking at viability models. We are very grateful to our community of donors that has been very accommodating in continuing current committed support (most of it multi-year), and allowing us to reschedule work for the short term.

The COVID-19 disruption will require changes in our messaging, as well as in our programmatic focus. In the short term (one to six months), we will need to look at how to refocus programmes—can we contextualize our work in better synergy with the emergency? Some fields of our work—such as waste management, sanitation and public health— are more directly related to the pandemic; others—such as with air pollution—have more indirect linkages.

We will need to redesign current interventions within programmes to contribute better to this emergency. Our ability to respond to subjects that may not be the immediate focus of our programmes—e.g. environmental linkages of economic dislocation and welfare issues, health science and health systems, zoonotic diseases, migrants and rural economy, energy markets, etc.—will be tested. We will need a more energized communication and outreach strategy to connect publicly and re-emphasize our work in this context. Public digital and communication platforms will get crowded; our messaging will need to find visibility and distinctness.

In the post-lockdown period, our ability to respond to a wider set of issues—e.g. economic reconstruction, stimulus with environmental safeguards, public health policies, rural economy etc.—and link these with environmental safeguards, public health, climate change and livelihood security will also be tested. On the global stage, we will need to track how environmental politics and environmentalism of the South will play out in this 'new' world. Work with governments, in India and outside, will be more purposeful and implementation-oriented. Perspective building will also require more high-level analytics and evidences. We will need to bring about a strategic shift in messaging in order to build a constructive agenda—narrative and solutions will need to be designed in support for harder decisions.

But the COVID-19 context can also allow us to raise ambition—during these lockdowns, the skies and our water systems are visibly much cleaner, there is less congestion on roads, and even wildlife sightings have gone up even in hitherto crowded cities. This presents an opportunity to leverage these lessons and evidences to remind decision makers just what it will take to bring about change at scale in a post-lockdown scenario—from pushing for changes in lifestyles and behaviour to raising public spending on infrastructure and tightening regulation, etc.

These will be needed to counter the push by governments to lower environmental safeguards (a likelihood in the post-pandemic world) in order to kick-start economies. Our programmes have to remind people that the cost of such a crisis can be far more disruptive in the future if we fail to build resilience now, in order to reduce long-term vulnerability for both public health and climate risk.

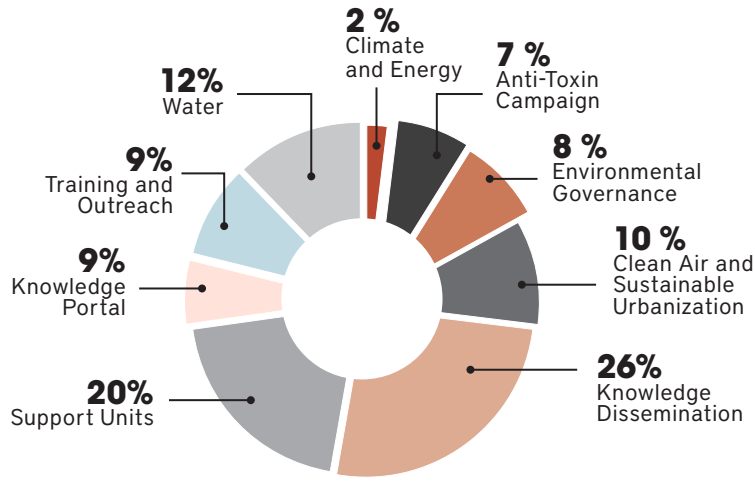
(Sunita Narain)

INSTITUTIONAL REPORT

Human Resource Management Report (2019–20)

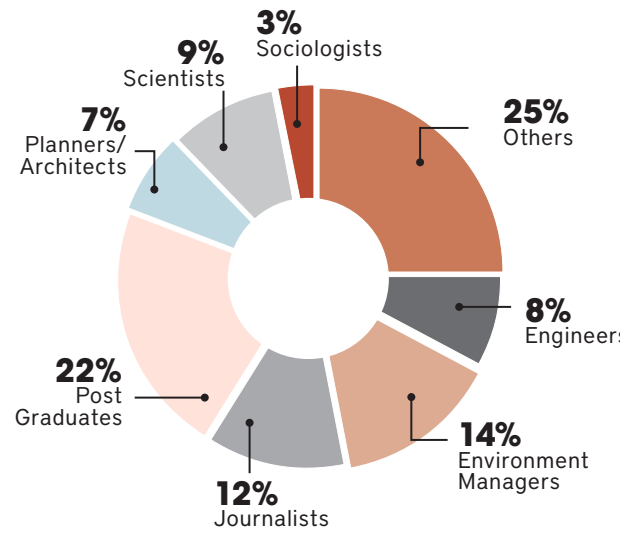
Over the years, CSE has strived to develop the best HR practices and has imbibed new policies while upgrading existing ones with time and as per need.

The past few years have focused on creating a second rung of leaders who have been assigned independent roles with more accountability. Some key staff have been developing their skills, motivating them to higher levels of performance and ensuring that they continue to maintain their commitment to the organization and organizational objectives.



NEW ADDITIONS TO OUR SECOND RUNG OF LEADERS: Our key focus remains to nurture talents to be able to occupy leadership positions. The idea behind is that no project must be dependent on any one person—it must not crumble or slow down with anybody's exit. Staff from several programmes have been promoted to take on independent roles, including those from Industrial Pollution, Food Safety and Toxins Programme, Green Schools Programme, Water and Sanitation Programme, and Climate Change.

CSE'S TALENT POOL: CSE has a strong workforce consisting of engineers, environmental managers, journalists, planners and architects, scientists and sociologists,



mostly postgraduates and above.

CSE is a fairly young organization with 59 per cent of its staff up to 40 years old.

The flip side of having a young workforce is attrition. This year's attrition rate was 19 per cent, of which the majority of CSE staff members left for 'better prospects' such as higher salaries, higher studies, mainstream media or government jobs. Some staff left due to the transfer of their spouse to another city, for health reasons, dissatisfaction or differences. CSE's Deputy Director General too moved on from CSE in this reporting period.

The workforce is stable—42 per cent of staff members have worked with CSE for more than five years and 26 per cent have served for more than 10 years.

GENDER REPRESENTATION: CSE strikes a balanced gender ratio across the organization and at every level. We have 40 per cent female and 60 per cent male staff. Interestingly, women hold 50 per cent of senior management positions.

CONTRIBUTION OF INTERNS AND VOLUNTEERS: The internship and volunteering programme continues to inspire young national as well as global talent. In 2019–20, CSE hosted 96 interns and volunteers over the year. Their contribution in terms of 'human days' was 3,339, which is equivalent to the contribution by 15 regular staff members in terms of 'human days'.

The programme had representatives from five countries outside India (Ireland, USA, France, Netherlands and the UK). The programme received experienced journalists under collaboration with Media Ambassadors India–Germany programme and hosted exchange students from the University of Delft, Netherlands. We received interns from reputed global universities, including Harvard University, University of Chicago and the University of Southampton, as well as Indian universities of repute such as Birla Institute of Technology and Science (BITS Pilani), Indian Institute of Technology (IIT), Jawaharlal Nehru University (JNU) and the National Institutes of Technology (NITs).

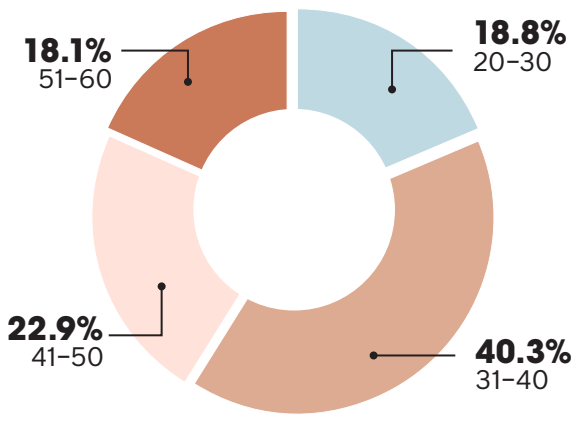
HIRED FROM TALENT POOL: The pool of talent and budding environmentalists with their contribution have helped us find the best talents, who have been hired as researchers by CSE.

PERFORMANCE APPRAISALS: The Programme Managers or Project Heads communicate from time to time with their staff individually or as a team and provide the necessary information regarding their performances and define their respective roles. This is beneficial as it enables staff to form an outline of their anticipated goals in clear terms and thereby helps them to execute goals with best possible efforts.

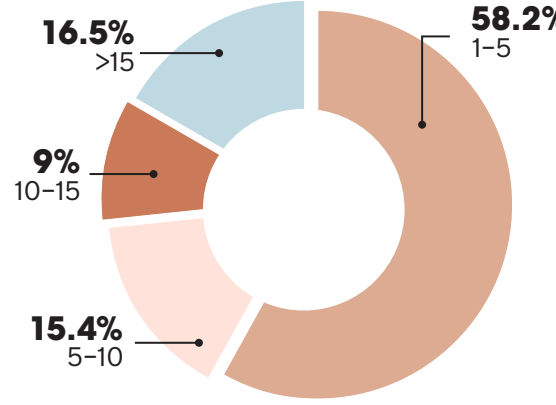
CSE also conducts quarterly review meetings of all teams to assess if the calendar of activities and objectives for that quarter have been met. Individual performance appraisal has always been through 360-degree feedback surveys. This helps to get an overall understanding of the strengths and weaknesses of the staff. Individual responses are always combined with responses from other people (e.g. peer, junior and seniors). Absolute anonymity of the assessor is maintained.

STAFF WELFARE SCHEMES: These have been provided for a better work environment and feeling of security. These facilities are monetarily supported, partly by staff and partly by CSE. Details have been mentioned below:

Age of employee



Years of employment



Medical facilities: Staff is provided with health insurance cover of INR 5 lakhs, and life insurance cover of INR 10–50 lakhs.

- For life insurance, 50 per cent of the premium is shared by staff, while health insurance is covered fully by CSE
- Family members of staff are also included in this policy, premium of which is borne completely by staff.
- People have benefitted tremendously by the insurance schemes. This facility has supported the staff to meet the expenses of critical illnesses like cancer and other treatments.

Canteen facilities: Our in-house, subsided, rooftop canteen provides healthy lunch, snacks and even dinner for staff working late night. While CSE bears the cost of the infrastructure and maintenance, procurement and salary of staff is borne by the staff.

Recreation facilities: A gymnasium facility with a trainer is available for the staff. The staff contributes towards half salary of the trainer.

Awards

INDIRA GANDHI PRIZE FOR PEACE, DISARMAMENT AND DEVELOPMENT FOR 2018

The international jury's decision was based on CSE's 'pioneering work over almost four decades in environmental education and protection, for its steadfast advocacy of measures to combat environmental deterioration, for its success in influencing public policies and programmes that have benefitted social and economic development in India, and for keeping the issue of environmental sustainability at the forefront of national attention and public policy'. Past recipients of this award include Mikhail Gorbachev; Gro Harlem Brundtland (Prime Minister of Norway, 1988; UNICEF (1989); Vaclav Havel (1993); Jimmy Carter (1997); the UN and Kofi Annan (2003); Angela Merkel (2013); the Indian Space Research Organisation (ISRO) (2014); and former Prime Minister of India Manmohan Singh (2017).

- Sunita Narain, CSE Director General was included in the 'World's 100 Most Influential People in Climate Policy' for 2019 by peer-to-peer learning platform for governments Apolitical

- Sunita Narain listed among '15 Women Leading the Fight against Climate Change' by *Time* magazine (https://time.com/5669038/women-climate-change-leaders/)

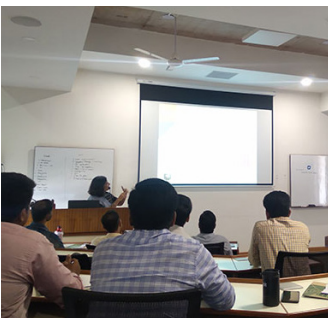
- Ishan Kukreti, *Down to Earth* magazine reporter was awarded the prestigious Prem Bhatia Memorial Trust award for Outstanding Environmental Reporting for 2019

- Edinburgh Medal for the year 2020: The Edinburgh Medal is awarded each year to men and women recognized for their contributions to science and technology and whose professional achievements have made significant contributions to the understanding and well-being of humanity. It was instituted by the City of Edinburgh Council in 1988 and is presented at the Edinburgh International Science Festival.

Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) has been the most recent addition and has greatly helped in coordinating every activity on one platform and enhanced accessibility of reports. The system integrates the personnel details, with the individual work plans and budgetary allocations.

With the finalization of the annual work plans for individuals and units, the details are fed into the ERP, bearing objectives and activities for every programme. The monthly tasks are directly linked to staff performance, accruing to CSE's performance. The plans are available on every terminal for the staff to report against the activities online.



Programme Monitoring: Snapshot

Trainings at AAETI: A total of 51 workshops and events were conducted at the Anil Agarwal Environment Training Centre (AAETI), including 14 with International participation from multiple countries at the pan-Africa/ international level. Almost half of all training and workshop participants were from government agencies or departments (see *Annexures for AAETI training data*).

- Major events organized in the year:
  - SFD Week (AAETI, April 2019)
  - Release of the 'First Food–III, Stockholm Water Week (August 2019)
  - Singapore Water Convention (June 2019)
  - India–Africa media briefing on Desertification (September 2019)
  - Anil Agarwal Dialogue: Annual Media Conclave on the State of India's Environment (February 2020)
- The capacity-building interventions directly engaged with 3,120 participants, with 33 per cent of the participants female.
- We had 76 publications over the year, which were disseminated through usage of rigorous campaign tools such as analysis, briefing papers, presentations, press notes, media briefs as well as direct engagement with official bodies and other stakeholders.

COVID-19: Institutional response

WORK FROM HOME

Ever since nationwide lockdown was announced from March end, 2020, CSE has maintained a work from home rule, with only a few admin and IT staff coming intermittently to office to provide support to people working from home.

PHILANTHROPY

- CSE staff voluntarily contributed one day's salary towards the COVID relief fund. CSE contributed an equivalent amount and donated INR 10 lakhs towards food for migrant workers.
- CSE had its presence in Uttar Pradesh for studies on wastewater and sanitation at the ground level. The Centre felt the need to provide PPE kits, gloves and masks for sanitation workers to the Nagar Palika Parishad in Bijnor and Chunar (in Uttar Pradesh).

STAFF SAFETY MEASURES

Significant measures have been put in place for the safety of staff at work and for when office is open to 30 per cent capacity.

- Sanitizers have been placed at the entry point and all other strategic places across all floors.
- Facemasks have been provided and made mandatory in office.
- Seating arrangements have been changed to maintain social distancing.
- People have been instructed to avoid crowding around toilets, balconies and canteen areas.
- Desks, office equipment and toilets are sanitized at frequent intervals.
- Premises have been fumigated.
- A rotating roster has been made for 30 per cent attendance.

Webinars and online discussion forums have become an important way to continue engagement with sector stakeholders as well as with media, civil society and citizens.

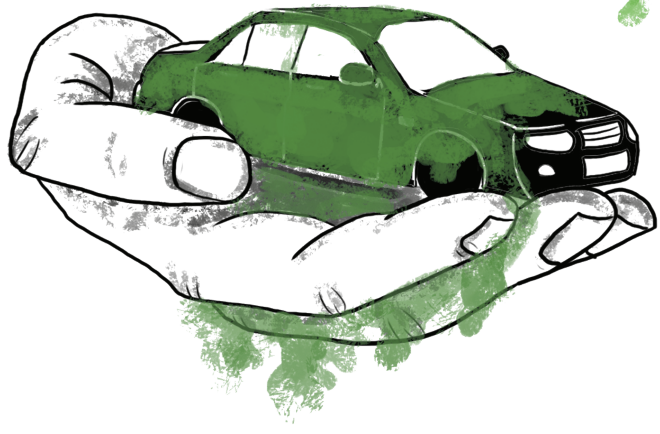
CSE conducted 11 webinars during this period as an immediate response to the crisis with a laudingly overwhelming participation. The webinars spanned various subjects, including:

- Need for Mainstreaming Non-Sewered Sanitation Solutions—Lessons from COVID -19 Response;
- Housing People, Not Diseases;
- From Animals to Humans;
- Going Digital in Stormwater Management; and
- Managing Faecal Sludge in Rural Areas.

name a few.

CLEAN AIR AND SUSTAINABLE MOBILITY

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



NATIONAL AND STATE-LEVEL COORDINATED ACTION FOR AIR- POLLUTION CONTROL

One of our long-standing demands in this field has been the introduction and enforcement of legally binding air quality standards and action plans in the country. In December 2017, due to our intense advocacy, the Union Ministry of Environment (MoEF&CC) informed the Supreme Court that it was preparing a National Clean Air Programme (NCAP); the plan was issued in January this year. CSE has submitted comments to the ministry, seeking a stronger compliance mechanism to meet the targets.

We have also engaged with the ministry on other air quality actions and contributed in preparing the CII–NITI Aayog's National Action Plan reports on biomass management, clean fuel and clean transportation.

In the period 2018–19, besides continuing our work in Delhi–NCR (details follow), we also made forays in three other states—Odisha, Andhra Pradesh (AP) and West Bengal. CSE is formally helping these states develop their Clean Air Action Plans. The NCAP requires states with non-attainment cities to prepare clean air action plans.

In India, the programme has three major initiatives:

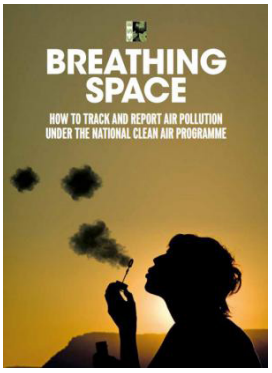
STRENGTHENING THE NATIONAL CLEAN-AIR PROGRAMME

CSE supports legal frameworks for a countrywide clean air programme, emissions standards roadmap and end-of-life regulations, and fuel economy regulations.

The programme pushes for raising the ambition of the National Clean-Air Programme (NCAP) targets and improving compliance. Many of the non-attainment cities have prepared clean air action plans under the National Clean Air Programme (NCAP) to achieve 20–30 per cent reduction in particulate pollution by 2024 from the 2017 level.

SCHEDULE OF BS VI VEHICLE NORM COMPLIANCE ENSURED: CSE closely tracked progress and intervened as needed in policy and regulatory venues and with the automobile industry to ensure that the BS-VI norm implementation schedule was not delayed. The BS VI rollout still faced a legal challenge from the auto industry, which was asking for delays in the implementation deadline; however, CSE's knowledge support and data-backed interventions to the Court process contributed to the Supreme Court's final directive that the original deadline of 1 April 2020 would have to be adhered to.

SUPPORT FOR BSVI TRANSITION TO STATES: From 1 April 2020, all new vehicles complied with BSVI norms. CSE has reviewed the implementation process and is working with the state governments to strengthen and upgrade on-road emissions inspection appropriate for advanced emissions control systems in BSVI vehicles and for better screening of existing vehicles. CSE is also advocating stronger BSVI reforms related to stringent real-world emissions monitoring and in-service compliance regulations for vehicles to be implemented from 2023 onwards.



The Ministry of Environment, Forest and Climate Change has taken on board CSE's method of assessment and reporting on air quality trend and compliance with air quality targets. Non-attainment cities will have to begin reporting on the long-term trend in PM concentration in ambient air and also compliance with the national clean air programme (NCAP) target and national ambient air quality standards. CSE's assessment is based on a review of best practices globally, and the proposed revision in method of calculation and trend analysis will help states report on air quality trends in a more scientifically correct manner.

ENHANCEMENT AND IMPLEMENTATION OF STATE-LEVEL CLEAN-AIR ACTION PLANS

CSE provides technical, strategic and capacity support to relevant state authorities in the states of Rajasthan, Maharashtra, Delhi-NCR, Odisha and West Bengal on multi-sectoral measures for clean air actions, encompassing all key pollution sources.

RAJASTHAN: CSE's cooperation with the Rajasthan State Pollution Control Board (RSPCB) on air quality management in Rajasthan cities has opened a unique opportunity to strengthen and implement the state's Clean-Air Action Plan, including control of industrial air pollution. RSPCB has agreed to adopt a regional/airshed view of the action planning process. The cooperation with RSPCB—the nodal body for coordinating implementation of the state's Clean Air Action Plans—is starting at a time when action plans for the non-attainment cities in Rajasthan have already been framed. Non-attainment cities are those that exceed safe pollution levels for at least five years and are notified for specific action planning by the Central Pollution Control Board (CPCB) for air pollution reduction.

CSE is uniquely placed to push for plans to be enhanced, and build capacities of the state to develop multi-sector strategy.

CSE has assessed the management of air quality and vehicular, industrial, and area-wide emission issues of the Jaipur region, which includes Alwar, Jaipur and Bhiwadi (for industrial air-pollution-control measures). The programme's cooperation is broadened to also include on-road emissions management with advanced systems, public transport improvement and promotion of zero- emissions non-motorized transport, in addition to pedestrianization and vehicle restraint measures, including a state parking policy.

MAHARASHTRA: CSE is engaged with the Maharashtra Pollution Control Board (MPCB) on assessing pollution from industrial and power plants in Mumbai Metropolitan Region. The findings of the assessment from coal-based thermal power plants in the states were captured in the publication *Cleaning Coal Power*, which wasre presented to MPCB for strengthening the enforcement. CSE also has surveyed and conducted ambient air quality monitoring assessments in industrial areas located in the Mumbai Metropolitan Region to understand the existing scenario of environmental management in the region. To develop sector-specific strategies, CSE is working with the state Department of Transport on managing on-road emissions and assisting the department in the imminent rollout of BS VI norms. In order to put together a multi-sectoral strategy for the Mumbai Metropolitan Region, an in-depth assessment of public transport and mobility patterns was conducted, as well as an assessment of the pollution under control (PUC) programme in Mumbai Metropolitan Region to understand the current levels of compliance to emission regulations.

DELHI: CSE's engagement in the Delhi–National Capital Region (Delhi–NCR) over many years spans a gamut of strategies, sectors and actions—from pushing for increased supply for natural gas to industries, ban on petroleum coke and furnace oil in four adjoining states, ban on coal in Delhi as per the approved fuel list, and also actions on vehicle

Targeted, drastic reduction in pollution from trucks in Delhi

As part of the effort to reduce emissions from heavy-duty truck traffic bound for other states but passing through Delhi, CSE supported the Supreme Court-appointed Environment Pollution (Prevention & Control) Authority (EPCA) in the design and later implementation of the radio-frequency identification (RFID) system for heavy duty vehicles at 13 major entry points of Delhi. Commercial vehicle operators were also given a deadline to install RFID/ FasTags in their vehicles. Toll plazas at Tikri, Badarpur–Faridabad Main, Badarpur–Faridabad, DND Flyway, Aya Nagar, Ghazipur Main and Ghazipur Old, Kalindi Kunj, Kapashera, Kundli, Rajokri, Shahdara Main and Shahdara Flyover are now equipped with cameras and sensors to enable cashless transactions.

RFID allows for real-time monitoring of truck numbers on a daily basis. CSE also helped design a multi-pronged approach targeting emissions from heavy duty vehicles, including diverting trucks to bypass roads, imposition of an 'environment compensation charge' (based on the 'polluter pay principle') on trucks entering Delhi, ban on entry of trucks older than 10 years and tightening enforcement on overloading, among others measures. These targeted measures have resulted in a drastic reduction of 80–90 per cent in truck traffic entering Delhi from these key entry points; they are now using expressways. This has led to massive reduction in both congestion and pollution from trucks in Delhi.

emission control measures such as ban on older vehicles, extensive efforts for pollution reduction from trucks (bypassing, banning entry of older trucks, cashless tolling, and imposition of pollution tax as environment compensation charge), dust control measures, industrial waste burning, among others. These wide ranging actions have resulted in improvement of air quality, as confirmed by Government agencies such as SAFAR and CPCB. However, Delhi still needs to reduce its PM2.5 levels by nearly 70 per cent to meet the safe level as per National Ambient Air Quality Standards.

CSE has pushed for expansion of natural gas supply for vehicles and industries. As of January 2019, a total of 500 stations were operating in Delhi, with plans for expansion of piped natural gas (PNG) network to 1,467 industrial sites in Delhi that have been identified for conversion to gas (1150 have been converted so far), incentivized by subsidies and tax breaks (e.g. exemption from GST) provided by Delhi government to industries.

CSE continued its support to EPCA in the implementation of a graded response action plan in Delhi–NCR along with long-term action as part of a comprehensive action plan. This has led to the implementation of the following air pollution control measures across sectors:

- Ban on use of diesel generator sets (exempt for emergency services) in Delhi, Ghaziabad, Noida, Greater Noida and Gurugram.
- Enhancement of charges under the Parking Policy that was directed by the Supreme Court of India.
- Only brick kilns that have been converted to zigzag technology are allowed to operate.
- The odd-even scheme for vehicles (four-wheelers) was in place for 12 days, from 4–15 November 2019, with the exception of 11 and 12 November (the 550th birth anniversary celebrations of Guru Nanak Dev).
- All coal-based industries that have not shifted to natural gas or agro-residue were to remain closed in the region.
- CSE identified 14 pollution hotspots in Delhi, three in Haryana and three in neighbouring areas in Uttar Pradesh, where massive amounts of plastic, rubber and other industrial waste were being burnt in the open, leading to the very high pollution. Industrial units also had uncontrolled stack emissions, sludge deposition, improper material storage and subsequent heavy fugitive emissions; a few units had air pollution control devices and common effluent treatment plants (CETPs) that were found to be defunct. An action plan was made and submitted to the Court by EPCA, and directions were given to relevant authorities to closely monitor and prepare local area action plans.

ODISHA: CSE supports the Odisha State Pollution Control Board (PCB) prepare for a 'department-wise action plan' for non-attainment cities. CSE has prepared and submitted Clean-Air Action Plans for six cities, most recently for Kalinga Nagar; measures are now being implemented. It also provided support to PCB to prepare a 'department-wise action plan' for non-attainment cities. CSE has been appointed member of the SPCB's technical committee to oversee Source Apportionment and Emission Inventory studies in non-attainment cities, where it is providing guidance on detailed protocols, drawn from its engagement with IIT Kanpur. It is also providing OSPCB sector-specific emission control options for industrial and power plant sector.

WEST BENGAL: CSE has submitted Clean-Air Action plans for six new non-attainment cities in the state— Barrackpore, Asansol, Durgapur, Haldia, Raniganj and Howrah. As part of its knowledge partnership with the West Bengal Department of Environment (DOE), it has supported the implementation of action plans for these cities. CSE works closely with a wide range of decision makers and regulators in the state, including the Department of Environment, State Pollution Control Board, and Transport Department, on a range of clean air and mobility concerns— improved public transportation, clean fuel policy, ban on polluting fuels in non-attainment cities, strategies for on-road emissions management, vehicle emissions inspection regime for BS VI readiness, control emissions from legacy vehicles and review of small and medium-sized enterprises (SME)/ industrial sector, among others. CSE's guidance led to implementation of GRAP-related measures during the winter period as part of the emergency response system to reduce peak pollution periods.

PUBLIC TRANSPORT AND MOBILITY STRATEGIES

BUS REFORMS IN WEST BENGAL: Cooperation with the state transport corporation (WBTC) on the state of public bus services, including in Kolkata, led to some reforms in bus depot operations and improvements in operational efficiency. CSE is preparing a guidance framework on public and private investment for bus fleet augmentation and service-level improvements.

BUS REFORMS IN HYDERABAD: CSE completed the first phase of its work on bus reforms in Hyderabad with the Telangana State Road Transport Corporation (TSRTC). The report *State of Bus Services: Hyderabad* has been shared with TSRTC.

As part of its support to EPCA, CSE pushed for Delhi regional connectivity to Rapid Rail Transit in the Delhi–NCR region, including reforms in state-level financial contribution for the project infrastructure, which will be shared between Delhi and Uttar Pradesh (for connectivity to Meerut).

PARKING POLICY FOR DELHI: As a member of the committee that has prepared the parking rules and guidelines for Delhi, CSE has informed this process to ensure that this is designed as a vehicle-restraint measure. Delhi has become the first city in India to notify parking rules as a restraint and pollution control measure. As part of this initiative Delhi is implementing pilot projects on parking management and last-mile connectivity in Kamla Nagar, Krishna Nagar and Lajpat Nagar. This has helped CSE take forward this work to other cities of India. For instance, there has been an opportunity to engage with the Kolkata Metropolitan Development Authority to get parking area management principles and pricing strategy on board.

GLOBAL: ASSESSMENT OF RESULTS (2019–20)

The programme has made good progress towards the achievement of long-term outcomes in both Ethiopia and Nigeria. There is today in both countries a definite trajectory to create clean-air action plans and guidance frameworks for clean-air targets, e.g. Nigeria's commitment to meeting Euro IV standards and Ethiopia's commitment to implementing Euro V standards.

ETHIOPIA: The step forward this year in Ethiopia has been a high-level meeting with the Environment, Forests and Climate Change Commission, Ethiopia, to collectively work out the detailed work plan to prioritize and take forward the Action Plan for Addis Ababa framed by CSE in close consultation with the key departments and ministries this year. The Commission has taken that on board from CSE and as a nodal body will expedite implementation. In addition, another critical area identified is immediate roadmap for fuel quality and vehicle technology improvement. CSE has also engaged with a wide range of government and regulatory agencies in the country. The CEO of the Ethiopian Petroleum Supply

Enterprise (EPSE) has asked for a discussion on the country's poor fuel quality—neighbours Kenya and Tanzania have already moved to low-sulphur diesel, while Ethiopia is still at 500 ppm. EPSE is also keen to work with CSE on tightening regulation on the import of used vehicles.

NIGERIA: In Nigeria within the larger multi-sector clean-air action planning process initiated with the Federal Ministry of Environment, specific strategies have been identified, including a roadmap for the CNG programme, national framework for parking policy and guidelines for mass transit for immediate strategy development. CSE is also working closely with the Directorate of Road Traffic Services (DRTS) on a wide range of issues pertaining to road traffic and vehicle administration. CSE's recommendations on the parking policy have been incorporated in the Federal Capital Territory Directorate of Road Traffic and Motor Vehicle Administration Services Bill passed by the National Assembly; there is continuing demand for CSE's support on parking policies in Abuja. CSE's engagement with the Federal Ministry of Transportation has deepened—the Permanent Secretary and Director have requested CSE's guidance on Nigeria's nascent CNG programme, as well as inputs into the national urban transport policy. This time, while working on the guidelines for the mass transit system special care is being taken to include detailed guidelines on gender sensitive indicators for designing of mass transport and access infrastructure. This has emerged from the inter-ministerial meetings in Nigeria.

PAN AFRICA: The programme has been active in Pan-Africa forums, especially on advocacy on air pollution control, with special emphasis on the issue of import of used vehicles. CSE's 2018 report *Clunkered: Combatting Dumping of Used Vehicles: A Roadmap for Africa and Asia* (https://www.cseindia.org/content/downloadreports/8863) continues to be referred to and cited by regulatory agencies to help shape their vehicle import policies. CSE is also a member of UNEP's used vehicle import working group. Similarly, the report *Clunkered* has found multiple references in the influential 2019 report of the International Council on Clean Transportation (ICCT), Global progress toward soot-free diesel vehicles. There has been a demonstrable uptake of research reports and trainings—Kotebe Metropolitan University, Addis Ababa, has requested a partnership with CSE on air quality monitoring, and measurement and management plan. Likewise, data and information from CSE's 2016 report *Urban Air Quality Management in Ethiopia: A Guidance Framework* (perhaps the first comprehensive report covering air quality management issues) was extensively used by UNEP in its 2018 report, *Addis Ababa City Air Quality Policy and Regulatory Situational Analysis*.

REGIONAL AND GLOBAL ADVOCACY ON LOW CARBON AND AFFORDABLE MOBILITY: This is being done by sharing information with regulatory agencies and presentations in global events. Our report *Clunkered,* on used vehicles, is being used by the regulatory agencies to help formulate vehicle import policies. As CSE is a member of UNEP's used vehicle import working group, inputs and comments were provided on their draft. ICCT has referred to and cited our report *Clunkered* in its latest report, *Global progress toward soot-free diesel vehicles in 2019*.Participation of Nigeria's Federal Ministry of Transportation (FMoT) officials in our stakeholder workshops and training programmes and learning about Delhi CNG programme have been useful for those who gave presentations and briefings to their Transport Minister, advocating for the CNG programme in the country. They have got a mandate and called us to collaborate with them on this.

INDUSTRIAL POLLUTION PROGRAMME

TO IMPROVE RESOURCE EFFICIENCY, CONTROL CONTROL, AND STRENGTHEN POLLUTION REGULATION, MONITORING AND COMPLIANCE ASSURANCE IN THE INDUSTRIAL SECTOR

As part of this broad programme theme, CSE pushes for resource efficiency improvements in coal-based thermal power plants, early implementation of the 2015 emission standards for thermal power plants (TPPs), and retirement of old plants.

In order to support the multi-sector clean-air action plans, the programme also conducts emission inventories of air-polluting industrial and small-industrial units located in industrial clusters that adjoin cities, including brick kilns.

The programme also designs tools and approaches to strengthen pollution regulation and environment impact assessments, and pushes for policy changes to allow the use of SMART and affordable equipment for monitoring.

COAL-BASED THERMAL POWER PLANTS

CSE pushes for resource efficiency improvements in coal-based thermal power plants in India. Specifically, the aim is work at both at the Central level as well as directly with states to push for early implementation of the 2015 emission standards for thermal power plants (TPPs), and also push for retirement of old TPPs. As part of this, CSE is working closely with the state authorities in Madhya Pradesh, Uttar Pradesh, Rajasthan and Haryana to push for implementation of new norms, and for implementing CEMS (continuous emissions monitoring systems), a new regulatory and monitoring regime.

The programme has had considerable success—The National Thermal Power Corporation (NTPC), India's leading coal-based thermal power producer, has awarded equipment tenders and repair works to meet the new standards for close to 90 per cent of its capacity. CSE anticipates that by the deadline (2022) more than half of the power stations will meet the particulate matter and NOx standards. However, 70 per cent of the power plants in India will still not be able to meet SO2 standards, and CSE is now engaging with this issue.

Meanwhile, following sustained research-based advocacy by CSE, the Central Electricity Regulatory Commission (CERC), has started approving costs submitted by thermal power stations for retrofitting the pollution control technology to meet the new stringent standards. CSE has also been advocating for robust penalty-incentive schemes for power plants that miss the deadline; and in line with CSE's position, the Central Pollution Control Board (CPCB) imposed fines in 15 power plants that did not meet the deadlines of 2019. Action is being also led by the Pollution Control Boards (PCBs) of Maharashtra (to collect bank guarantees from power stations to accelerate implementation), Uttar Pradesh (discussing implementation status with power stations), Madhya Pradesh and Rajasthan (circulated questionnaires curated by CSE to assess the current status over implementation) to compel power stations to take steps to meet the deadlines. Approximately 8 GW of 34 GW (30 per cent) of the old power stations have been retired as on date. The Union Minister of Finance has also advised power stations to consider shuttering old stations.

Industrial air pollution

The team has worked to collect solid emission inventory on the air polluting industrial units in Delhi-NCR districts. Based on the inventory, the team is preparing a detailed report on the status of industrial pollution and broad recommendations for stakeholders. The inventory assists in drawing the attention of regulators for targeted action on a subset of violators/polluters. Policy goals include affecting a fuel policy change (shifting from coal to natural gas), and shifting the focus of the government to subsidising fuel rather than pollution control technology, improving CEPI process of CPCB, capacity and infrastructure of pollution control board officials, are the broader policy advocacies of the report. Six NCR districts plan are being prepared 1) Panipat, 2) Sonipat, 3) Bhiwadi, 4) Gurugram, 5) Faridabad, and 6) Ghaziabad, and submitted to EPCA for action. Plans are being prepared for targeted action for industries to be included in the National Clean Air Plan (NCAP) of cities in the states of Maharashtra and Rajasthan. Exclusive surveys have been conducted in industrial areas which has failed to meet the ambient air quality standards in Rajasthan.

GLOBAL: ASSESSEMENT OF RESULTS (2019–20)

Coal-based thermal power plants: A key win for the programme was achieved in May 2019, when the Ministry of Environment, Government of the Republic of Indonesia, finally notified new emission norms for thermal power plants in the country. The new norms reflect a significant tightening, especially for upcoming (new and under-construction plants). These now have to meet the SOx and NOx standards of 200 mg/m3 each instead of 750 mg/m3, which will require installation of advanced pollution-control equipment. For old, existing plants, the standards for SOx and NOx have been reduced from 750 and 850 respectively to 550 mg/m3 (similar to the levels that old and small existing plants in India are expected to meet). As for PM standard, it has been cut by half from 100 to 50 mg/m3 for new plants and from 150 to 100 mg/m3 for old ones.

The notification and subsequent implementation of the new norms will have a significant impact not only on Indonesia's air quality, but will also improve resource efficiency of TPPs. This initiative began in 2015, during phase 1 of Sida's support to CSE's global programme. CSE had partnered with the Indonesian Centre for Environmental Law (ICEL), a leading independent research and advocacy NGO to conduct a two-year (2015–17) comprehensive analysis of the Indonesian coal-power sector. The Ministry of Environment, Indonesia, acknowledged the study's findings and supported a revision of the standards. The ministry also invited CSE to discuss the notification process. Broad sectoral as well as emission data were shared with CSE seeking technical inputs. Between 2018 and 2019, CSE undertook a series of dialogues with the government to alleviate concerns raised during public consultations regarding the draft norms. The final notification was enacted by the government in April 2019.

Since the notification, the TPP industry body has made efforts to dilute the norms and escape compliance. CSE's continuous engagement and follow-ups have motivated ICEL and other local NGO's to push the government for early implementation of norms—especially in and around densely populated areas such as Jakarta—and are preparing strategies to push for compliance. CSE is also following up with the Ministry of Environment to identify new but related areas of intervention that can support implementation, such as continuous emissions monitoring systems (CEMS), which on being implemented has the potential to strengthen monitoring and compliance.

SMART AND AFFORDABLE MONITORING PROGRAMME

In India, the programme has two related but distinct areas of interest: Pushing for policy/legislation to allow the use of SMART equipment for monitoring, and catalysing cleaner brick-production technologies. CSE is working with the standards setting agency, Bureau of Indian Standards (BIS), to recommend technical specifications of low-cost sensors, which will pave the way for their wider use. BIS (CHD 35 committee) has accepted CSE's draft and has agreed to form a subsidiary panel (called Panel 4). A September 2019 consultation meeting on Panel 4 collected feedback from key stakeholders—this process will continue to be pushed.

Bricks sector

The polluting, socially detrimental bricks sector continues to dominate the construction sector in India. It is the second largest producer of coal-fired clay bricks in the world, with an annual production of more than 250 billion bricks that consumes 350 million tonnes of clay (top soil) and 35 million tonnes of coal, and requires 10 million migrated labour. The sector is a major contributor of emissions—it consumes around 35–40 million tonnes of coal per year, making it the third largest consumer of coal in the country.

The brick sector contributes a staggering 60 per cent to the total industrial emission of black carbon. CSE efforts are geared to push for the conversion of brick kilns to clearer technologies such as 'zigzag' brick kilns. There is considerable pushback, as conversion involves costs and there is a strong lobby with deep interests in the status quo. CSE interventions range from monitoring kilns to prove the efficacy of zigzag kilns despite claims that change in fuels (e.g. use of agricultural wastes instead of coal) alone would reduce emissions. CSE's report *Brick Kiln Monitoring: Zigzag vs FCBTK* stopped the Ministry of Environment, Forests and Climate Change (MOEFCC) and the Central Pollution Control Board (CPCB) from allowing operation of FCBTKs with agriculture waste as a fuel. National-level efforts involve engaging with the National Brick Mission to move towards a cleaner, resource efficient and sustainable brick production.

Playing a watchdog role, CSE's research showed that 85 per cent of the units producing flyash bricks in the Delhi and surrounding areas—widely touted as an alternative to clay bricks—were below the required standard quality. Uttar Pradesh has included fly-ash bricks and other fly-ash products in their 'rate of schedule' for usage in state government infrastructure projects. The UP state pollution regulator has directed kilns in 15 'non-attainment cities' to convert to zigzag technology, while in West Bengal, the judiciary has ordered all brick kilns in the state to convert to zigzag technology. Meanwhile, trainings (five were conducted in this reporting period) remain an important intervention strategy on compliance enforcement, especially on strengthening inspection procedures and to enable brick kilns conversion to zigzag technology.

GLOBAL: ASSESSMENT OF RESULTS (2019–20)

This programme has gained significant traction in this reporting period, and the outcome target for the interim period has been partially achieved.

SMART and affordable monitoring frameworks have been rolled out in Ethiopia. The country's Environment, Forest and Climate Change Commission (EFCCC) has accepted the water quality monitoring network protocol proposed by CSE for the Awash River Basin. The Awash Basin Authority has initiated monitoring since October 2019 as per the protocols recommended by CSE.

The focus has turned to the development of protocols for the management of polluted river stretches. This is an important initiative given the growing challenge of river pollution in Ethiopia caused by industrialization and urbanization, especially in and around Addis Ababa and other heavily industrialised areas. The situation is made more challenging since there aren't any enforceable compliance standards for the industries in Ethiopia and it will only get more dire as there are 19 more industrial parks that are currently being planned within Ethiopia. The Akaki River, which flows through Addis Ababa, was selected as a pilot to prepare a management plan for polluted river stretches. Reconnaissance surveys on polluted stretches were conducted jointly with EFCCC officials in July 2019, with support from the Addis Ababa

Authority. CSE also provided EFCCC officials with potable field water testing kits monitor water quality on river stretches. Monitoring data has helped identify pollution hotspots, and the programme is assisting authorities in the development of a monitoring report and action plan. The larger objective of this exercise is to develop a comprehensive framework for the management of polluted river stretches, which can be adopted by all Basin Authorities in Ethiopia for managing the polluted river stretches within their respective basins.

On the request of EPCCC, CSE prepared the (draft) Environmental Audit Guidelines (manual along with audit questionnaire) for EFCCC; when finalized, this manual will be used in training programmes to capacitate EFCCC officials on the audit procedure.

The SMART and affordable

monitoring initiative has recently expanded to a second country, Ghana. The Environment Protection Authority of Ghana requested CSE's inputs on environmental audit and demonstration of SMART monitoring in October 2019. CSE's recommendations have been incorporated in the audit manual; once finalized, the audit manual will be published by EPA, following which CSE will conduct a series of trainings for EPA officials.

The programme has remained active in building capacities of pollution regulators across the global South on EIA regulations, and on strengthened monitoring, enforcement and compliance assurance. This initiative got a boost with the decision of the Swedish Environmental Protection Authority (SEPA) to continue its cooperation with CSE on conducting exposure visits to Sweden for Indian regulators over the next two years. SEPA is in the meantime conducting an independent evaluation of its programme with CSE, the final report of which is awaited.

EIA/Impact Assessment (2019–20)

This component of the programme designs tools and approaches to strengthen pollution regulation and environment impact assessments across the global South. As part of this, CSE recommends environment assessment approaches that are tailored to high impact/visibility sectors, and then helps build capacities of officials/regulators in the application of these approaches.

In Tanzania, following the 2018 notification of EIA Regulations, CSE helped build capacities of officials from mining, energy and the National Environment Management Council (NEMC) on the implementation of these new regulations. In Tanzania, CSE has also worked on the EIA guidelines for the building and construction sector, and on environmental guidelines for 'linear projects', both of which have been submitted to NEMC for review.

In Namibia, CSE's *EIA Screening Framework*, which includes a scoring method for assessing the magnitude of social and environmental impacts of proposed projects, has been accepted by the Ministry of Environment and Tourism (MET) for test runs. Similarly, *EIA Guidelines for Mining projects* has been submitted to the Ministry of Mines and Energy for review. CSE also developed a *Screening Questionnaire* on sand mining for Environmental Clearances; this has now been finalized (http://www.eia.met.gov.na/). All environmental clearances for sand mining projects in Namibia are now based on the questionnaire developed jointly by CSE. A series of trainings were conducted by CSE on EIA, review, inspection and EMP compliance for a wide cross-section of regulators convened by MET in Namibia.

In Zambia, CSE is assisting the Zambia Environmental Management Agency (ZEMA) on capacity building on EIA and social impact assessment (SIA) on mining. A training was jointly organized with the World Bank, under the aegis of the Zambia Mining and Environmental Remediation and Improvement Project (ZMERIP). CSE also put together research advocating for 'benefit sharing' of revenues/royalties with communities involved with the mining sector in Africa, as a strategy to offset the 'resource curse' that is prevalent across the global South.

District Mineral Foundations (DMFs)

CSE is working with state and local governments in Odisha, Jharkhand and Chhattisgarh to strengthen local institutions for people-centric, effective and accountable development in mining districts.

The Mine and Minerals Development and Regulation (MMDR) Act provides for the establishment of District Mineral Foundations (DMF) across all mining districts in the country, to be resourced from the fees and royalties that mining companies pay the state, and which perform as 'trusts' working for the benefits of mining affected communities. DMFs provide a defining opportunity to address some of the pressing social and human development issues that affect communities in India's mining areas.

As among the most prominent civil society voice on DMF today, CSE plays the role of a watchdog and convenes civil society engagement with state and local government, and catalyses media attention on DMF.

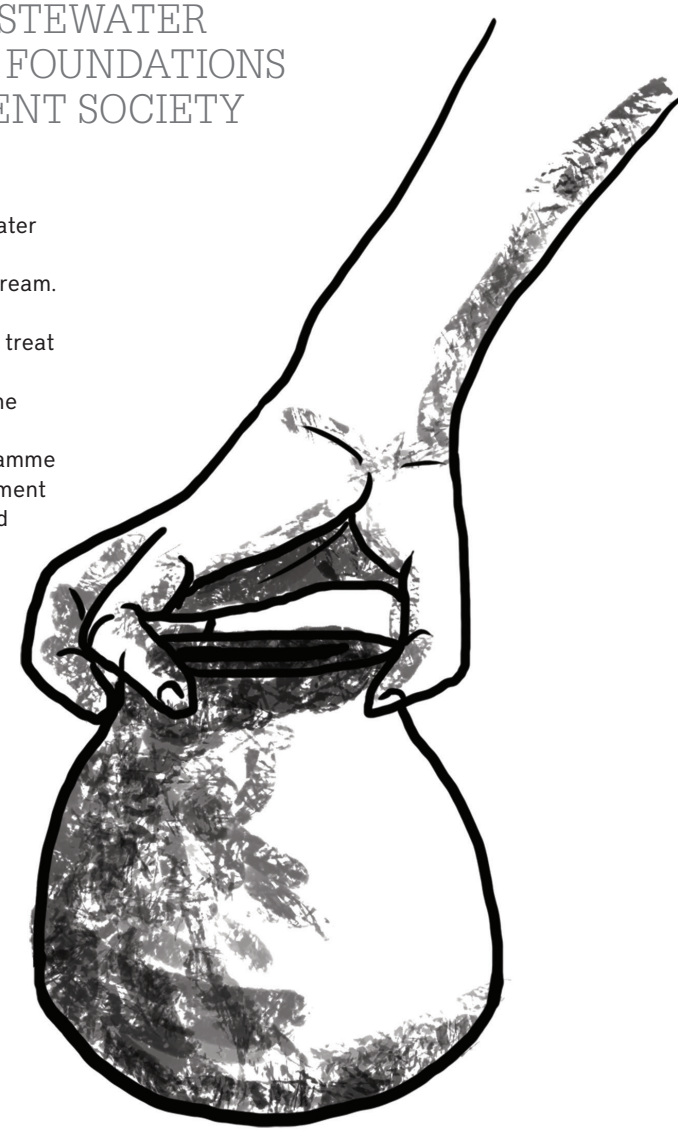
- CSE's 'status reports', which evaluate the progress and performance of DMFs in India's key mining districts, are perhaps the only independent evaluation of DMF functioning and implementation, and have prompted changes in DMF regulations and guidelines at state and Central level.
- The Ministry of Mines (MoM)'s revised DMF Manual has incorporated most of CSE's recommendations to amend the Pradhan Mantri Khanij Khestra Kalyan Yojana (PMKKKY), which guides DMF functioning, fund use and accountability.
- CSE's 'indicative plans' (model plans) help guide better DMF investments in nine key mining districts of Jharkhand and Odisha, with funds allocated for nutrition and health (in West Singhbhum and Ramgarh districts in Jharkhand); others (Keonjhar, Chatra, Dhanbad, etc.) have privileged investments for livelihood and nutrition; Angul district has undertaken integrated watershed management projects through the DMF Trust (DMFT) etc.
- CSE has advised NITI Aayog on use of DMF funds. Chhattisgarh has amended its DMF Rules in August 2019 based on CSE's recommendations, including representation of mining-affected gram sabhas (village councils) in the DMF body and representation from Scheduled Tribes (STs); directing DMF investments in areas most affected by mining; capping investments in physical infrastructure; and independent public review through social audit, among others.
- CSE is working with the government of Jharkhand on revising the state's DMF Rules. The government of Odisha had revised the state DMF Rules in September 2018, following CSE's status report to improve the scope of DMF investments on directly affected areas and people.

SUSTAINABLE WATER MANAGEMENT AND SANITATION

TO ESTABLISH POLICY PRINCIPLES, INNOVATIVE TECHNOLOGIES AND IMPLEMENTATION STRATEGIES FOR WATER AND WASTEWATER MANAGEMENT TO HELP LAY THE FOUNDATIONS FOR A WATER- AND WASTE-PRUDENT SOCIETY

With growing urbanisation and affluence, cities are becoming water guzzlers, drawing water from cleaner upstream sources and disgorging their waste—sewage and industrial effluents—downstream. Cities are too poor to afford the capital intensity of the modern sewage system and the energy required to transport, pump and treat wastewater. While the current method of water and wastewater management used by cities is capital- and resource-intensive, the benefits do not percolate down to the urban poor.

CSE's Sustainable Water Management and Sanitation Programme is geared to help reinvent the urban water–wastewater management system. Interventions are designed to help build institutional and technical capacities of key agencies and practitioners, install demonstration projects on alternative technologies that serve as useful models of good practices, and leverage policy and implementation opportunities by working closely with city-level water and sanitation agencies.



INDIA PROGRAMME

In India, the programme is working on water and waste management, including faecal sludge management (FSM), with special focus on cities and towns in the Ganga River Basin in the state of Uttar Pradesh (https://www.cseindia.org/page/programme-support-for-fssm-in-uttar-pradesh). It provides technical assistance to the state and to urban local bodies in designing viable, sustainable and effective solutions that encompasses the entire sanitation value chain—from assisting the state and municipal authorities in designing enabling policies, guidelines and business models (resource recovery) to building capacities of multi-stakeholder groups in planning solutions for their city.

The State Septage Management Policy passed by the Uttar Pradesh Cabinet in October 2019 represented a key win for the programme in this reporting period. The policy has built-in milestones with the ambitious target of implementing faecal sludge and septage management (FSSM) by 2023 in all 652 urban local bodies (ULBs) in the state. The policy proposes a holistic approach, with interventions across the sanitation value chain and the need to mainstream health and safety of sanitation workers; includes sustainable business models (such as the levying of septage fee by the ULB (in line with sewerage tax) and provision for scheduled desludging to be implementing in ULBs; and provides multiple options for treatment of faecal sludge and septage across cities and towns in the state, including co-treatment in mechanized sewage treatment plants.

CSE has been invited to be part of Uttar Pradesh's Alliance for Urban Transformation, for convergence and collaboration for water and sanitation for all. The Alliance includes all state actors as well as development partners; specialist subgroups have been formed in the area of FSSM, solid waste management (SWM), water management etc. to monitor progress. CSE's initiative, Forum of Cities that Manage Septage, provides technical and advisory support to cities in the state and closely tracks their progress in implementing FSSM. Orientation sessions and hands-on trainings are conducted each month on FSSM at the ULB offices. An online FSSM tracker tracks the progress of FSTPs in the state, with special focus on the AMRUT and NMCG priority towns. The team has also developed checklists and monitoring and eveluation (M&E) frameworks to evaluate the progress cities. CSE has championed 'co-treatment' of faecal sludge and septage in STPs in the state. CSE will provide scientific, technical and monitoring support to Bharwara and six to seven additional cities; the learning from these pilots will be used to scale-up co-treatment of faecal sludge in STPs across the state.

TECHNICAL SUPPORT TO BIJNOR, CHUNAR: The programme has active presence in Bijnor and Chunar in the state, and provides on-ground assistance to city authorities in implementing solutions—designing desludging operations as well as implementing co-treatment facilities and faecal sludge treatment plants, among others. As part of its deep dive strategy in these cities, CSE engages with the multi-stakeholder City Sanitation Task Force to create city sanitation plans. Executive officers, sanitary inspectors, desludgers, masons and others directly implementing sanitation solutions are trained by CSE. By-laws as well as guidelines and action plans on FSSM prepared with the assistance of CSE have been approved by Bijnor and Chunar and are under process for notification. The first faecal sludge treatment plant (FSTP) to be funded under the National Mission for Clean Ganga (NMCG) programme will be implemented in Chunar. There is significant uptake of CSE's model by-laws that were prepared for the city of Bijnor—cities such as Unnao, Barnar, Bakshi ka Talab, and others, have requested CSE's support in developing their by-laws. FSSM by-laws have been approved by the Bijnor city authorities, which includes regulations across the FSSM value chain including constructing septic tanks as per BIS code, regular emptying of septic tanks, licensing of vacuum truck operators, penalties for non-compliance, etc. The city's STP (to be tweaked to be readied for co-treatment of sludge) has been commissioned by tapping all the major nullahs of the city.

The programme has pushed for the implementation of FSTPs; two FSTPs are operational—in Jhansi (through ULB funding) and at Unnao (through AMRUT funding). A total of five FSTPs are under construction at Loni, Rae Bareli, Lakhimpur, Modinagar and Chunar (the first project under the Government of India's Namami Gange flagship programme). Scaling up of FSTPs is in progress through AMRUT funding in 31 cities. As of March 2020, agreements were signed for FSTPs to be constructed in four cities— Aligarh, Pilibhit, Shahjahanpur and Moradabad; commercial bids in response to the first phase of tendering have been received for FSTPs in 25 cities.

Capacity building remains a major focus, and CSE's School of Water and Waste (SWW: https://www.cseindia.org/page/school-waterwaste) housed at the Anil Agarwal Environment Training Institute (AAETI) organized a total of 18 training programmes (including four online courses) to help build capacities of close to 300 city and municipal officials, sector professionals and NGOs; of these around 75 have taken some actions to implement learnings on ground. SWW has also

installed model projects on rainwater harvesting, decentralized faecal sludge and wastewater treatment plants on the campus.

INTERNATIONAL COLLABORATIONS: CSE has emerged as a key hub in the global South for cross learning and capacity building on urban water and sanitation, and has secured a wide gamut of collaborations and partnerships with sector networks and international universities, including International Water Association (IWA), University of West England, UK, the International Water Security Network and Cooperative Research Centre (IWSN), Water Sensitive Cities (Australia) and IHE Delft Institute for Water Education, among others. Collaborations range from capacity building and joint research on water energy, designing water-sensitive city plans and designing blue-green Infrastructure. Its ongoing internship programme attracts four to five international researchers each year. The programme has active presence on global sector platforms to contribute to global policy dialogues—CSE participated in FSM-5 (Cape Town), IWA Water Development Conference (Colombo), and at StormWater 2019 and OEES Conferences (Poland).

GLOBAL: ASSESSMENT OF RESULTS (2019–20): The programme is on track to achieve the intermediate outcome—there is a clear buy in from city and state-level authorities in South Africa (and in a limited way in this reporting period also in Bangladesh) to adopt citywide planning on sanitation and faecal sludge management (FSM). This will be pushed more aggressively in the coming period.

The programme is widely acknowledged as a resource hub in India as well as in Africa (in partnership with Water Research Commission (WRC), South Africa) and South Asia (in partnership with the regional office of WaterAid, Bangladesh) on training city and sanitation planners in the preparation and deployment of 'shit flow diagrams' (SFDs), a tool to readily understand and communicate how excreta physically flows through a city or town—from defecation to disposal or end-use. The SFD report helps planners by presenting the service delivery context, including investment priorities by identifying implementation gaps identified across the sanitation chain. CSE is part of a global alliance that is putting together a regional and global database on SFD city case studies maintained by SuSanA.

A highlight in the year was the SFD Week (April

2019), a unique gathering of more than 140 global experts hosted at CSE's Anil Agarwal Environment Training Institute (AAETI) in Nimli, Rajasthan. The international conclave was conducted in partnership with SuSanA (a global platform pushing for the achievement of SDG-6); International Water Association (IWA), and NFSSM Alliance (an alliance of 32 organizations pushing for enduring solutions across the sanitation value chain). Discussions at SFD Week ranged from water security, climate change, and tools and approaches for ensuring citywide inclusive sanitation to best practices, solutions and technologies. Keynote speakers included top government officials, heads of water and sanitation flagship programmes, as well as international sector experts.

In South Africa, the programme worked with its country partner Water Research Commission (WRC) to identify specific counties in which to implement city-wide FSM planning and to build capacities and provide guidance to urban local bodies. The effort is designed to understand gaps in policy to help upscale faecal sludge management in South Africa. WRC is including SFDs in national-level strategy document on implementing faecal sludge and septage management solutions across the country. As a next step, one to two small and medium towns of South Africa (which have already developed SFDs) will be identified to provide training and hand-holding support to implement citywide sanitation as well as water- sensitive design and planning (WSUDP). Three big cities of South Africa—Durban, Cape Town and Johannesburg— have included WSUDP approach within their core policies. CSE's WSUDP training has been developed as an accredited course for continuous professional development.

Efforts are underway to build a community of practice of professionals by creating a web-based compendium with case studies from Asia and Africa. There is interest and traction in the WSUDP approach—institutes from the European Union Network of Blue-Green; Cooperative Research Commission on Water-Sensitive Cities (CRCWSC), Australia; and the International Water Security Network (IWSN) have approached for partnership with CSE.

In Ghana, CSE worked with its partner, Council for Scientific and Industrial Research, Institute of Industrial Research (CSIR-IIR, Ghana) to prepare guidelines on integrated wastewater and faecal sludge management for the country. The document was reviewed by a mixed group of stakeholders at a round table meeting. It is clear that there is demand to pilot the guidelines, develop toolkits, conduct training programmes and conduct exchange programmes in collaboration with CSIR.

In Rwanda, CSEs report, *Potential of Rainwater Harvesting in Rwanda*, which it published in collaboration with its partner, Rwanda Water and Forestry Authority (RWFA), has been uploaded on the ministry website. In Bangladesh, CSE partnered with WaterAid-Bangladesh, and has identified cities to assist for citywide faecal sludge management (FSM) planning and implementation, including training of implementers and decision makers in the water and sanitation sector. CSE is also exploring partnership opportunities in Sri Lanka and Nepal to implement sanitation planning (SFD) tools and approaches to citywide planning.

RURAL WATER AND WASTE PROGRAMME

In India, the programme is designed to ride on the policy opportunities of the government's special focus on safe sanitation. The Department of Drinking Water and Sanitation's 10-year strategy, released by the Ministry of Jal Shakti in September 2019, will push local governments, policymakers, implementers and other stakeholders to go beyond 'Open Defecation Free' (ODF) and towards a vision where everyone uses a toilet and every village has access to solid and liquid waste management.

States such as Rajasthan and Punjab have approached CSE to help them plan projects on liquid waste management in rural areas. Training on sustainable sanitation practices in rural areas remained an important intervention—the team built capacities of 116 stakeholders in the year almost all of which were from district- and state-level water and sanitation-linked departments (from the states of Karnataka, Bihar and Punjab). Many participants have prepared detailed project reports for many districts and the states are in constant touch with CSE for this purpose. Those trained at CSE act as Master Trainers for grassroots-level officials in different blocks and gram panchayats.

RURAL SANITATION (INDIA)

WATCHDOG ON RURAL SANITATION: The programme closely tracks national and state-level performance of rural sanitation programmes. Research is focused on what is working and where with regard to toilet technologies and rural sanitation as part of holistic water and waste management. As part of its watchdog role, the programme extensively tracked the state of solid liquid waste management in rural India and wrote close to 30 articles and features for *Down to Earth* magazine.

BUILD CAPACITIES ON SAFE SANITATION: The programme builds capacities of state, district and grassroots-level actors on safe sanitation, including the management of grey and black water and faecal sludge management. A total of 120 participants from Karnataka, Bihar and Punjab were trained in the year. CSE will provide implementation assistance to the projects planned by the trained officials in blocks and gram panchayats across the country. The programme will also assist state governments of Punjab and Rajasthan in implementing safe solid- and liquid-waste management in rural areas, in line with the government's Rural Sanitation Strategy (2019–29).

MODEL VILLAGES ON SOLID-LIQUID WASTE MANAGEMENT, ALWAR: CSE will work closely with block and gram panchayat officials in Kotkasim and Mundawar blocks in the district of Alwar to turn these into models for solid–liquid waste management; plastic management will be integrated in these projects.

GLOBAL: ASSESSMENT OF RESULTS (2019–20)

In the first year of phase 2 of the project, the team had played the role of a watchdog to track national-level performance to build toilets and to research on what is working and where with regard to such aspects as reviewing available toilet technologies, behaviour change approaches and waste management, including advocacy on safe disposal and/or management of facael sludge in rural areas. The team also wrote extensively in *Down to Earth magazine* to track the state of safe sanitation and solid–liquid waste management in India as well as the global South. Team members routinely served as sources for leading electronic and print media on sanitation and water pollution coverage.

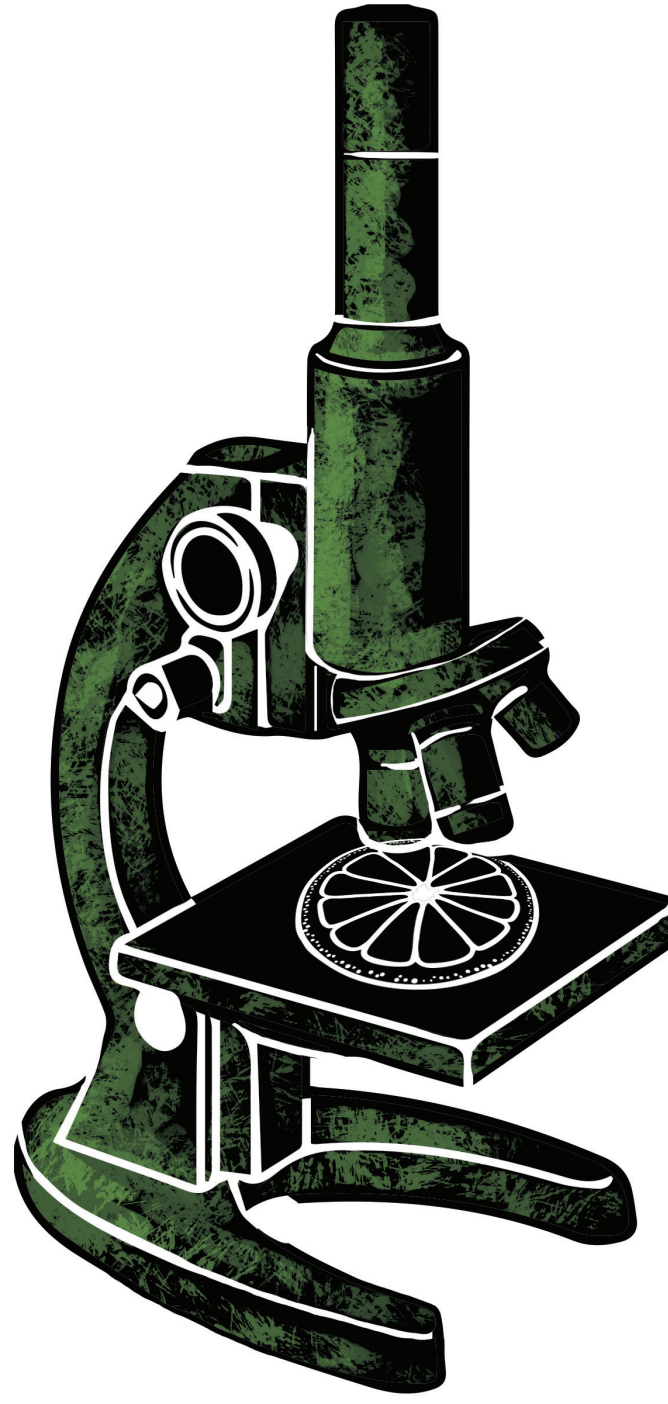
The team today has established contacts with a network of practitioners and decision makers in Sub-Saharan Africa. A meeting in March 2019 convened key stakeholders from across Africa to discuss common challenges including mismanagement of faecal sludge due to absence of proper guidelines, policies and safe toilet technologies. There is clear interest by stakeholders in Nigeria, Uganda, Kenya and Ethiopia to work with CSE on safe sanitation.

The Ministry of Water and Environment, Government of Uganda, formalized this relationship by signing an MoU with CSE to develop a strategy for faecal sludge management in rural areas and on groundwater recharge methods. In Nigeria, CSE's policy brief on the safe management of faecal sludge and wastewater was released in the Ministry's office, and the Minister, Federal Ministry of Environment (FME), Dr Mohammad Mamoud Abubakar, reached out to CSE for assistance in preparing a framework on safe sanitation, especially in rural areas, and building capacities of government officials.

To strengthen its part of the network/alliance-building efforts, CSE invited journalists from Ethiopia, Uganda, Nigeria, Zambia, Djibouti, Tanzania and Ghana to a field-level excursion to Churu district in Rajasthan, India, where villagers have been motivated to give up open defecation; several articles were published by the visiting journalists in their home publications.

FOOD SAFETY AND TOXINS

TO INFLUENCE THE FOOD BUSINESS TO ALIGN WITH SOCIETAL OBJECTIVES OF NUTRITION, LIVELIHOODS AND SAFETY



The programme adopts a range of measures and approaches, from laboratory tests on food, toxins and nutrition to research, surveys and policy analyses, advocacy and campaigns targeted at schools, health professionals, food policymakers, health-regulatory and food-certification agencies and the general public.

It addresses new challenges on environment and health, and responds to emerging issues such as junk foods and non-communicable diseases (NCDs), the growing crisis of heavy antibiotic use in food animals, and the environmental spread of antimicrobial resistance in humans. The campaign against toxins in food, including policy of safe pesticide use, pushes for reform in the regulation of toxins in food for reduced public health risks, while the Good Food Campaign connects organic food and food safety to livelihoods of food producers and nutrition for all.

ANTI-TOXINS CAMPAIGN

In India, the programme has a defined campaign to address animal and environmental aspects of antimicrobial resistance (AMR). Specific interventions have been taken to reduce the use of antibiotics as growth promoters in livestock/fish/poultry/agriculture.

Ban on last resort antibiotics in animal feed: CSE successfully pushed for the ban on the use of colistin, a last-resort antibiotic used in hospital ICUs, in food-producing animals, poultry, fish and animal feed supplements. The Health and Family Welfare (MoHFW)'s ban is significant as it represents the first government notification to ban an antibiotic in the food-animal sector in light of AMR concerns, and sets a precedence for future regulation of other critically important antibiotics as growth promoters.

CSE also successfully pushed for a tighter BIS standards on poultry feed (December 2019), which banned the use as additives in animal feed of antibiotics used to treat humans. Four out of seven allowed antibiotics and related chemicals (exclusively used in animal feed) will be phased out by 2023 and the remaining three by 2025. This represents a significant step as it brings animal feed into the regulatory purview, and feed manufacturers will need to comply with mandatory BIS standards. Subsequently, FSSAI (the country's food regulator) plans to regulate animal feed and in the coming period, CSE will engage with the regulator in framing feed regulations.

AMR State Action Plans: CSE is assisting select states in India to frame and implement the AMR national action plan. As part of this initiative, the programme is working with three states—Kerala, Delhi and Madhya Pradesh. In Kerala, one early success is the state's decision to phase out non-therapeutic antibiotic use over the next three to five years. CSE also assisted the state in developing an integrated AMR surveillance framework for animals and the environment sector. Stakeholders in Kerala, with the help of CSE, developed an integrated AMR surveillance framework for animal and environment sectors. CSE worked closely with authorities in Delhi on the state's AMR action plan (released in January 2020) and is now involved in its operationalization, as a member of the state's Core Working Committee. The plan includes almost important CSE recommendations, especially on the animal and environment dimensions of AMR. Similarly, Madhya Pradesh's AMR state action plan acknowledges CSE's active contribution. Other states, including Assam, Karnataka, Haryana, Maharashtra and Andhra Pradesh, have requested CSE's inputs and assistance in state action plan development.

Antibiotics in APIs: CSE has also pushed for standards for antibiotic active pharmaceutical ingredients (APIs) in pharmaceutical/common effluent treatment plant (CETP) effluents. The Environment (Protection) Amendment Rules, 2019, has stringent limits for 121 antibiotics, and also applies to treated effluents from CETPs with membership of bulk drug and formulation units. If notified, India will become the first country in the world to have legally enforceable discharge limits for antibiotics in waste from the pharmaceutical industry. CSE was part of the expert panel that worked with the CPCB to develop these standards.

Campaign on junk foods: CSE's long campaign on junk food labelling and display regulations on pre-packaged foods continues, with FSSAI's July 2019 draft notification. The programme will continue to push for front-of-pack, colour coded (red for junk foods) labelling based on thresholds for a nutrient on junk foods, especially those targeting children—including a ban on promoting junk foods near schools. CSE recommendations that have been partially addressed on the draft notification. These include added sugar on labels, labels on fast foods items and menus, and strong opposition to the exemption that FSSAI provided junk food manufacturers from labelling foods with GM ingredients up to 5 per cent, among others. In June 2019, the Maharashtra Food and Drig Administration (FDA) asked schools and colleges to restrict junk foods based on guidelines created by the FSSAI-led expert group of which CSE was a member.

GLOBAL: ASSESSMENT OF RESULTS (2019–20)

The intermediate outcome has been achieved, with the programme providing active assistance to the Ministry of Health, Government of Zambia, in the implementation of the country's national action plan (NAP) on AMR. This initiative has received high-level political buy-in, and a robust governance mechanism has been established to oversee the implementation of the NAP on AMR in the country. The Antimicrobial Resistance Coordination Committee (AMRCC) reflects multi-sectoral ownership and consensus, which is critical to the success of AMR containment in any country. Four reports and a *Down to Earth* cover on AMR to guide the implementation of Zambia's NAP-AMR were released at the Pan-Africa workshop on effective implementation of national action plans on AMR held in January 2020. The reports, developed with different stakeholder ministries over the year, cover a gamut of concerns and strategies on AMR, including laying out an outline of Zambia's Multi-sectoral National Action Plan on AMR; suggestions and baseline information/data for an integrated antimicrobial resistance surveillance framework; and a roadmap to phase out non-therapeutic antibiotic use and critically important antibiotics in food animal sector in Zambia. These research reports were released by the Zambian health minister.

Namibia, Nigeria, Tanzania and Zimbabwe: Engagements in other countries were catalysed by the January 2020 Pan-Africa workshop on implementation of NAP on AMR, which saw the participation of sector experts from 10 African countries, including Zimbabwe, Botswana, Malawi, Ghana, Ethiopia, Kenya, Tanzania, Uganda, Nigeria and Namibia. There is clear demand from several countries— including from Namibia, Nigeria, Tanzania and Zimbabwe—seeking assistance from CSE in the implementation of animal and environmental aspects of AMR. There is wider interest from multilateral agencies, such as the WHO-Africa, which uploaded select CSE reports developed for Zambia on its website to help guide other African countries (some of these reports are also available on the website supported by the United Nations Office for the Coordination of Humanitarian Affairs).

Pan-Africa: CSE has found traction in influencing global policy on AMR. CSE director general Sunita Narain was invited to join an Advisory Group to develop the terms of reference (TORs) of the Independent Panel on Evidence for Action against Antimicrobial Resistance in a One Health context. The UN Interagency Coordination Group on Antimicrobial Resistance (IACG) requested the United Nations Secretary-General, in close collaboration with the tripartite organizations, and other international organizations, to convene this panel. Earlier, certain recommendations of CSE on animal and environmental aspects of AMR containment got reflected in UN-IACG report of April 2019. The reports prepared for Zambia were shared with stakeholders representing the WHO-FAO-OIE (World Organization for Animal Health) tripartite and others from the erstwhile UN-IACG group as well as a few global civil society groups. CSE experts are routinely invited to participate in consultations organized by WHO, Tripartite AMR Secretariat, Antibiotic Resistance Coalition and Welcome Trust as well as foreign media and researches.

SOLID WASTE MANAGEMENT

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

The programme addresses institutional structures involved in waste management, treatment and disposal; helps build regulatory and technical capacities of cities; and highlights the role of the informal sector.

Interventions include strengthening regulatory practices, exposure to best practices on handling and disposal of all kinds of waste—municipal, hazardous, e-waste and biomedical—and creating handy toolkits to simplify waste handling and management, including standard operating procedures on effective compliance, monitoring and enforcement for waste handling, processing and disposal.

MUNICIPAL SOLID WASTE PROGRAMME

In India, the programme's objective is centred on creating cost-effective, environmentally sound and locally and/or regionally adapted solutions to solid waste, and working with state and city authorities to strengthen the implementation of Swachh Bharat Mission (SWM) (Clean India Mission). CSE has organized a network of close to 80 cities across India as part of the Forum of Cities that Segregate, and the network—comprising city managers, mayors, elected officials, representatives from municipalities, utilities and NGOs—act as an experience- sharing and learning platform. Progress towards waste management of individual cities is mapped to the government's surveys and clean-city rankings.

The programme has a deep dive in Muzaffarpur (Bihar), where it handholds authorities and municipal service providers. All 49 wards in the city are today segregating waste at the source, the total decentralized centres have increased from two to four, including facilities for dry waste management. Muzaffarpur is considered a model city for waste management in the state—105 urban land bodies in Bihar have adopted the Muzaffarpur model. The National Geographic Plastic Expedition Team, led by international researchers visited Muzaffarpur to document these efforts in the city. In the Swachh Survekshan League 2020 (government ranking of clean cities), Muzaffarpur was awarded the top position amongst all cities in Bihar and secured an overall ranking of 179 among 353 cities in the 1–10 lakh population category.

The state has passed the Plastic Waste Management by-laws, for which inputs were given by CSE under the advisory state-level advisory body (SLAB) committee. Currently, the ban includes only plastic carry-bags; the state has imposed fines on vendors and is working on provision of cloth bags.

CSE has worked closely with city authorities on construction and demolition (C&D) waste management, and the municipality has installed a C&D plant in the city. Other support provided to Muzaffarpur include preparing a feasibility plan for sanitary landfill on the basis of which the city has floated a tender to invite vendors for landfill site management.

GLOBAL Assessment of results: 2019-20

The programme pushes for policies, standards and regulations to mainstream circular economy with focus on decentralized management of waste, waste minimization, source segregation, resource recovery. Efforts continued to build on phase 1 efforts in Zanzibar to expand the ongoing pilot to entire island.

A key win was secured this year when Zanzibar finally passed (and gazetted) the Urban Municipal Council Solid Waste Management (SWM) Regulations, 2019 (November), developed by CSE as part of phase 1 of Sida's support to the global programme. The draft regulation was approved during the full council meeting at the Zanzibar Urban Municipal Council (ZUMC) and was further approved by the Regional Commissioner's office and the Ministry of the Local Administration, Zanzibar. The new regulation is currently under government press for printing as a gazette notification. It is the first of its kind in East Africa and is based on the polluter pays principle. In addition, the Shauri Moyo (in Nairobi, Kenya) pilot, which CSE had initiated with local communities, now spreads across all 626 households—over a period of two years, all of Shauri Moyo has adopted the segregation incentive waste management model. The local cooperative has been incentivised from the sale of compost and recyclables. An important regulation on SWM was passed that will facilitate the replication of the Shauri Moyo pilot in other municipal councils in Zanzibar.

There is much interest from mainland Tanzania. CSE has received requests for technical support from Arusha municipality and from Ubungo and Kigoma Region in mainland Tanzania to help replicate efforts in Zanzibar, both regulation and the decentralized pilot in their respective regions.

A key development in eSwatini (former Swaziland) is the notification of Plastic Regulations (2019) by the Swaziland Environmental Authority (SEA), which paves the way introducing a levy on plastics and a total ban in three years. This regulation has been adapted from CSE's *Integrated Waste Management Guidelines*, which the programme prepared for eSwatini authorities in phase 1 of Sida's support to CSE's global programme. Efforts continue to push for the notification of the Mbabane Municipal By-laws on Waste Management. eSwatini has also created a draft Waste Management Strategy document that captures the latest trends in waste management, particularly addressing and strengthening the issues of waste minimization, regulatory frameworks, partnerships, collaborations and networks. This is under review. In country efforts in India, eSwatini and Zanzibar (Tanzania) have allowed the programme to participate in Pan- Africa and global dialogues and platforms. CSE was invited by the International Solid Waste Congress, 2019 (in October 2019) in Bilbao, Spain, to speak on adoption of resource- efficient decentralized models, and in Zanzibar, Tanzania. CSE also presented case studies from Africa and India in the Zero Waste Cities Conference in Penang, Malaysia, in October 2019.

SUSTAINABLE HABITAT

TO PUSH URBAN HABITAT AND HOUSING POLICIES, STRATEGIES AND PRACTICES TOWARDS RESOURCE EFFICIENCY, THERMAL COMFORT, EQUITY, AFFORDABILITY AND LIVEABILITY

The goal of the programme is to push for effective policies to green the building sector and increase awareness about 'green' buildings. India is yet to build over 60 per cent of its future building stock. The challenge is to build new buidlings that are efficient, sustainable, affordable and comfortable for all. The priority intervention, therefore, must ensure that new buildings and appliances meet stringent efficiency standards and targets, and utility reforms accelerate retrofitting, behaviour change and rapid turnover of existing buildings and appliances. The programme has also launched an initiative of greening architecture education with the aim of integrating green features and sustainability courses into the curricula.

THERMAL COMFORT AND RESOURCE EFFICIENCY WITH FOCUS ON AFFORDABLE HOUSING

The objective of this work is to influence housing projects, primarily affordable housing schemes, to promote convergence between thermal comfort requirement mandated by the National Cooling Action Plan and energy efficiency requirements of the Energy Conservation Building Code for housing (ECBC-R). This is designed to influence policy and practice for quicker uptake of architectural design, use of alternative building materials and walling assembly, and building layout design to reduce heat load on buildings and improve thermal comfort to reduce air-conditioned hours. This is also expected to improve overall liveability. CSE works with Karnataka and Telangana state nodal agencies for affordable housing to evaluate housing stock under the state housing schemes based on these criteria to build roadmap for implementation.

- This initiative has targeted to influence the Pradhan Mantri Awas Yojana (PMAY), India's flagship affordable housing policy, to include aspects of liveability, thermal comfort, resource efficiency and environmental sustainability. This is an opportune moment, as PMAY is being rolled out to construct more than 11.2 million housing units by 2022 to meet the housing needs of the country. Improvement in design or materials used in affordable housing schemes will therefore help reduce the sector's footprint in a climate-constrained world. CSE's publication, *Beyond the Four Walls of PMAY,* tracked and assessed the implementation of the scheme by states. Another CSE publication, *Optimizing the Third Skin*, is an analysis of walling assemblies for thermal comfort, energy efficiency and liveability in PMAY projects. This study was endorsed by the Central Public Works Department (CPWD) at a national meeting, and the report's findings will be included in CPWD's new GHAR Rating System.

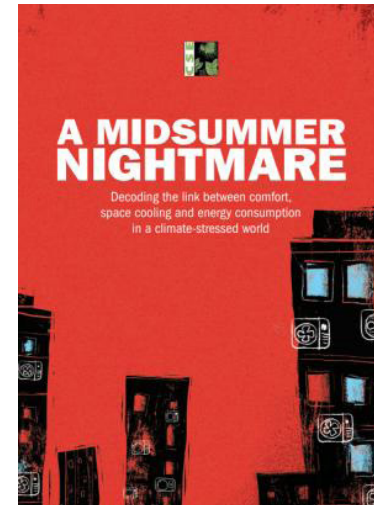
- CSE's views on resource efficiency and thermal comfort in affordable housing were also shared with housing lending institution HUDCO, and with the committee preparing the global WHO Housing and Health Guidelines.

Inclusive planning for low-income neighbourhoods

This initiative aims to influence and strengthen relevant policies, implementation strategies and community initiatives on inclusive urban planning and housing solutions for vulnerable low-income neighbourhoods, including resettlement colonies and informal settlements. For instance, PMAY has a vertical for self-constructed housing and slum development which along with other schemes need to be influenced from the perspective of urban planning, affordable and sustainable housing and transportation solutions to reduce public health and climate change risk in cities.

CSE is developing this work in the National Capital Territory of Delhi (NCT Delhi) and Hyderabad/Telangana to assess the current projects and promote mixed income and mixed-use development with efficient and affordable connectivity and improve environmental security. Affordable housing projects—both government as well as private mass housing projects in Tier 1 and 2 Towns in Telangana and Karnataka—are being studied, modelled and simulated. Various parameters in terms of provisioning for affordable housing sites under the master plan, as well as proximity of these sites with regard to socioeconomic infrastructure and services such as schools, colleges, medical facilities, transport, etc. are being mapped using a Geographical Information System (GIS). The socioeconomic burden of routine expenditures of families living in such housing is also being computed.

The programme engages with a wide network of institutions and sector professionals in states to mainstream policies on thermal comfort, equitable access to public services and liveability in the affordable housing sector, including Jawaharlal Nehru Architecture and Fine Arts University, Telangana; School of Planning and Architecture University of Mysore, Karnataka; state housing corporations; CPWD officials responsible for affordable housing schemes; and Energy Conservation Building Code (ECBC) dedicated nodal agencies (DNA), among others. Trainings have drawn more than 250 participants from Punjab, Karnataka, West Bengal, Delhi and Maharashtra.



The CSE report *Midsummer Nightmare: Decoding the Link between Comfort, Space Cooling and Energy Consumption in a Climate-Stressed World* contributed to the government's notification that makes it mandatory for all room air conditioners to have 24 degree Celsius as default set point, starting this year. Also, the Centre's guidelines issued for usage of air conditioners during the COVID-19 pandemic has set a higher set point of 24–30 degree Celsius to minimize the indoor spread of the virus.

C&D Waste

The management of construction and demolition waste has emerged as a potent challenge, given the prolific construction and rebuilding that the country is undergoing today. CSE's interventions are designed to build a circular economy around the construction industry. This initiative has contributed deeply to the clean air action plans that CSE has helped to prepare in non-attainment cities. These include cities of West Bengal, Odisha, Rajasthan, Delhi, NCR, among others. Research is geared to assist the target cities implement C&D waste Rules of 2016. The programme closely studied C&D waste management practices at the collection and transfer station as in North Delhi. CSE conducts trainings for university faculty for national/state construction companies such as the Central Public Works Department (CPWD), which is the government's construction agency for infrastructure projects. Modules on circularity in the built environment were created, with focus on building waste management covering all types of waste typologies.

Green Campus initiative

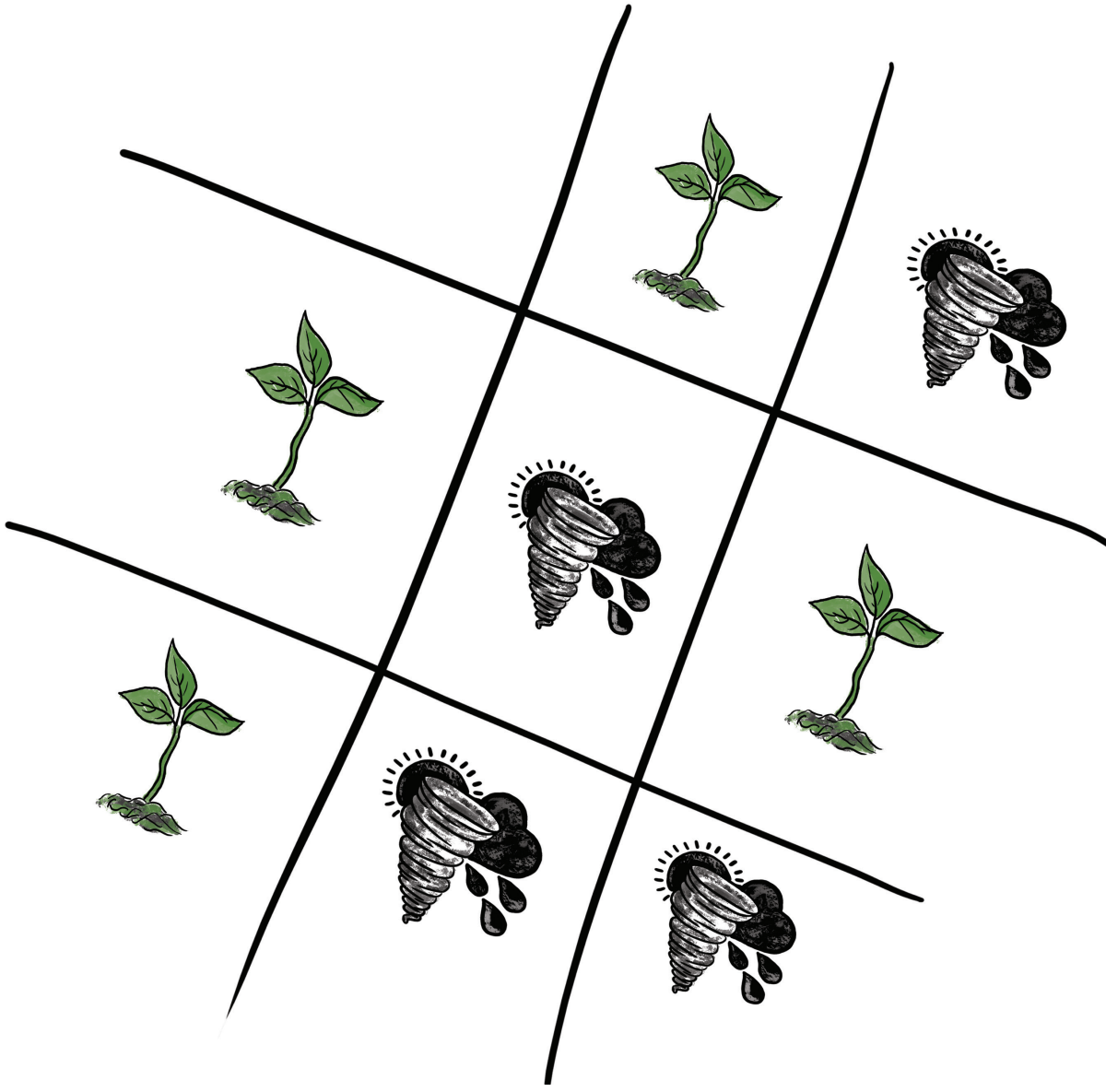
This intervention is designed to demonstrate that holistic resource management and closing the loop of waste can reduce the environmental footprint of campuses. CSE conducts campus-wide assessments of energy efficiency, water and waste parameters; provides guidelines for institutions to implement, followed by capacity building; and also inputs into greening curricula, including curricula of planning, engineering and architecture colleges.

- CSE worked with CPWD to help green 100 'general pool residential accommodation' colonies within a period of 100 days. CSE works with CPWD to implement pilot projects on solid and liquid waste management and rainwater harvesting at the National CPWD Academy. CSE inputs were accepted by CPWD in the revision of its Green Rating system for buildings.

- A compendium on green rating criteria for campuses was published, which included five case studies. CSE is pushing for the national accreditation council for higher education to consider green building /campus indicators when accrediting universities and colleges across the country.

- CSE works closely with faculty and academic councils of urban planning, architecture universities and colleges in Punjab to include environmental sustainability into curricula. CSE assisted the Guru Ramdas School of Planning in the launch of the Centre for Sustainable Habitat, and is providing technical assistance in designing the curricula of an MA in Sustainable Architecture and an MA in Transport Planning. The university was awarded in the Swacch Campus rankings organized by the Ministry of Human Resource Development.

- CSE conducts faculty development programmes in universities in West Bengal, Telangana and Karnataka. It works with campus management to help set up green teams/ committees to help secure funding, for e.g. through the Department of Science and Technology (DST), to execute pilots such as vehicle-free campus, public bike-sharing, on-site liquid and solid waste treatment, solar rooftop, lighting and cooling efficiency and rainwater harvesting, among others. These case studies were published in *A Green Campus Compendium* and shared at a national-level conclave with more than 70 colleges and universities.



CLIMATE CHANGE

TO PUSH FOR LOW-CARBON GROWTH STRATEGIES; MAINSTREAM CLIMATE CO-BENEFITS AND BUILD A CLIMATE-RESILIENT SOCIETY IN INDIA; AND WORK TOWARDS AN AMBITIOUS CLIMATE DEAL IN THE GLOBAL ARENA, BASED ON EQUITY, FAIRNESS AND HISTORICAL RESPONSIBILITY

BUILDING RESILIENCE OF THE MARGINALIZED, WITH FOCUS ON AGRICULTURE AND FOOD SECURITY

In 2017–18, we released an assessment report of the Pradhan Mantri Fasal Bima Yojana. The assessment received extensive coverage, and triggered detailed responses and rebuttals from the Union Ministry of Agriculture and the Tamil Nadu Agriculture Department. Findings of the report were raised in Parliament, and the government ordered a review of the scheme. The ministry initiated the practice of issuing 'acknowledgment receipts', based on a recommendation of the report.

The team also prepared a set of reports on India's National Action Plan on Climate Change (NAPCC) and State Action Plans on Climate Change (SAPCC)—these have been acknowledged as some of the first and most comprehensive assessments of the plans in the country. The findings were discussed at a stakeholder consultation of select experts and policymakers. CSE is now using the outcomes from these reports and the consultation to evolve a strategy on mainstreaming adaptation in India.

In the year that followed, 2018–19, we focused on pushing for an equitable global goal on adaptation (GGA) under the Paris Agreement. A report was prepared, which attempted to demystify and simplify the otherwise unclear and obtuse concept for implementation. The team also did a side event at the 24th Conference of Parties (CoP) to the UNFCCC in Poland on the subject jointly with CARE International. The subject of loss and damage and global parlays on it were closely followed and commented upon— the key meetings that were tracked included that of the Warsaw International Mechanism on Loss and Damage (Bonn, October 2018) and the Suva Expert Dialogue on Loss and Damage (Bonn, May 2018). We have also engaged with Act Alliance, Action Aid and German Watch to push for mobilisation of finance with regard to loss and damage. At CoP24, the team campaigned to have loss and damage reflected across the elements of the Paris Agreement Rule Book, by engaging with Indian, African and Island group negotiators. We have also been a part of the CAN working group on adaptation and loss and damage.

INDIA

In India, the programme has engaged with the Ministry of Environment, Forests and Climate Change (MoEFCC), as well as with the Ministry of Earth Sciences. CSE has participated in deliberations on the review of India's next NDC, and has been requested to prepare framing reports on G20 emissions trends. The climate programme has also engaged with the India Meteorological Department—providing state-specific recommendations to increase investment in the agromet system—and to provide inputs into public–private collaboration on weather data. A weekly digest on climate change from the global South reaches out to 5,000 climate researchers and decision makers in India, Africa and rest of world.

GLOBAL: ASSESSMENT OF RESULTS (2019–20)

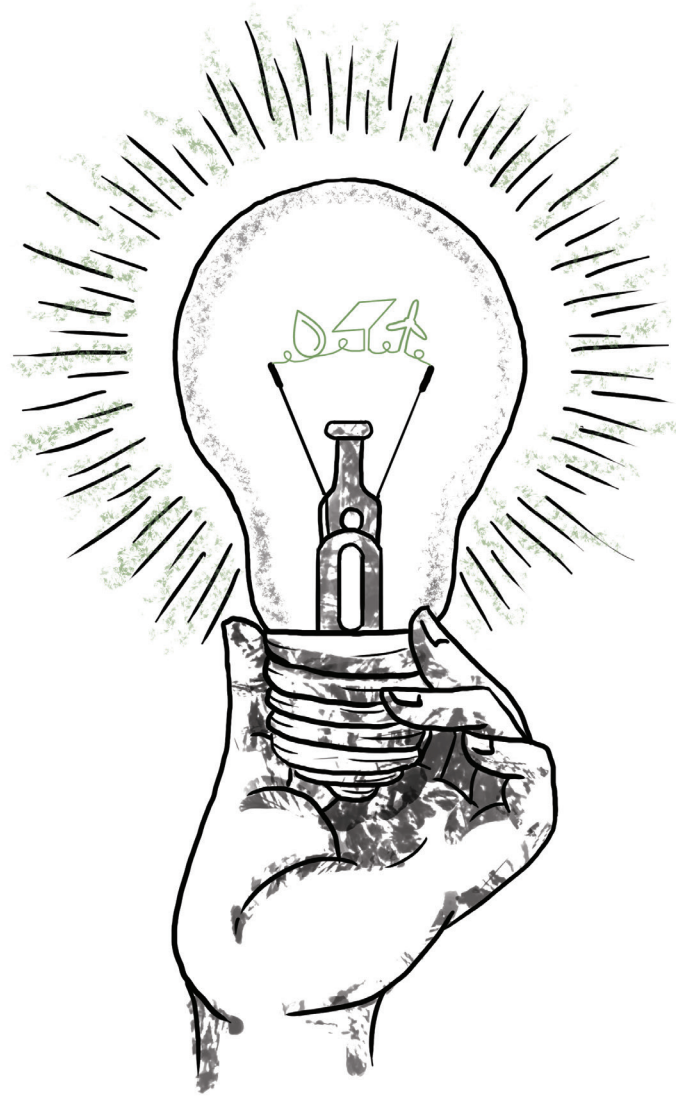
In the first year of this phase of the programme, limited progress has been made by creating ties and relationships with select climate-linked officials in Africa, especially around carbon markets and making first steps towards integrating the Paris Rulebook into national policy processes. In the coming years, we expect to be able to recommend concrete measures for countries to integrate adaptation into their development agenda.

Meanwhile, the programme is navigating contradictory pressures on the climate agenda. The Paris Rulebook focused discussions until it was largely concluded at the end of 2018. The long-term future of the Paris Agreement is in doubt, at least until the end of 2020. Our efforts to maximize impact in this in-between environment have concentrated on three areas:

- Preserving the minimum commitments in the Paris Agreement, through our work on US emissions, carbon markets and NDCs.
- Strengthening the links between climate action and the development agenda, through our side-event at the Desertification COP, and our work on agrometeorological advisories in India.
- Setting expectations for climate ambition over the coming decade, through our work on net zero targets and NDCs.

The connections made during our work on carbon markets and the global goal on adaptation in 2018 remain strong. There is continued interest from international negotiators (e.g. Fiji, Nigeria, Argentina, Mexico, Costa Rica, Uganda, South Africa) on fresh recommendations for carbon markets, which is the last pending high-profile item in the Paris Rulebook. A representative of Nigeria at the UN Desertification COP indicated interest in working on the climate implications of the Great Green Wall in Africa.

Going forward, our work on international negotiations can range from deepening the Paris Rulebook and integrating it into national policy processes, or setting a fresh agenda for a new type of climate agreement altogether. Either way, the demand for concrete recommendations on climate adaptation will increase. We continue to field regular requests from journalists to comment on extreme weather stories, ranging from heat waves to locusts.



RENEWABLE ENERGY

TO ACCELERATE GROWTH OF RENEWABLE ENERGY AND ENERGY ACCESS FOR THE POOR THROUGH POLICIES AND PROGRAMMES, ESPECIALLY FOR DECENTRALIZED, OFF-GRID CLEAN POWER OPTIONS

CSE's renewable energy programme is designed to accelerate the deployment of renewable energy and strengthen energy access for the poor by designing relevant policies and programmes especially for decentralised, off-grid clean power options. The co-benefits of moving to renewable energy sources in a climate-challenged world are immense—energy security, climate protection, reduced pollution and health benefits.

However, challenges to upscale remain. There is an urgent need for a long-term plan to move from subsidy, incentives and tax exemptions and allow renewable energy to reach grid parity and, most importantly, play a role to provide access to large numbers of energy poor.

CSE's efforts are dedicated to ensuring development and implementation of sound renewable energy policies and programmes at the national and local government levels to enable large-scale deployment of renewable energy technologies in various sectors of the economy in order to meet the twin objectives of combating climate change and ensuring energy security.

INDIA

The India focus of the Renewable Energy (RE) programme is to help develop and advocate pathways and strategies for a 100 per cent renewable energy future. In continuation of these efforts initiated through the publication of the book *State of Renewable Energy* (SoRE), continued commentary was made. As part of this, CSE plays a watchdog role on following policy and market developments and flagging crucial issues of concerns for growth in clean energy, including critiquing the government's plan ecosystem for the RE sector, or flagging the issue of piling dues for the RE generators. The programme has some focus on solar water pumps, including the government's Pradhan Mantri Kisan Urja Suraksha evem Utthan Mahabhiyan (PM KUSUM) scheme—especially in the context of utilization, economics and groundwater exploitation, a crucial component of the 100 per cent transition to RE in rural areas. The programme also pushes for distributed generation of RE (rooftop, open-access and mini-grids). As part of this initiative, CSE is engaged with residents and city government in the city of Gurugram to push for the adoption of solar rooftop (SRT). There is high-level buy-in for CSE's ideas on making Gurugram a model solar city—for instance, interest and support from the Gurugram Member of Parliament, Rao Inderjit Singh, on CSE"s specific and detailed inputs.

GLOBAL

CSE's Renewable Energy programme continued its engagements in two focus countries. In Tanzania, CSE has signed with the Ministry of Energy & Minerals an MoU, which includes capacity building to support the growth of RE as well as assist in the development RE strategy for the country. In this first year of phase 2 of the programme, a strategy paper for RE promotion was submitted in October; the plan is to continue to push for the adoption of recommended measures in the country's RE strategy.

In Indonesia, CSE continues its partnership with the Ministry of Energy and Mineral Resources, Government of Indonesia, covering research support for solar and wind development. Here, our past work helped establish the crucial role SRT can play in Indonesian cities. Since then, a small target has been set by the government and net metering regulations have been notified. However, gaps remain in policy and business models are missing.

ENVIRONMENT EDUCATION

TO FOSTER ENVIRONMENTAL LITERACY AND MEANINGFUL ENVIRONMENTAL EDUCATION AMONGST SCHOOL AND COLLEGE STUDENTS BY MOVING BEYOND THEORIES AND TEXTBOOK KNOWLEDGE TO 'KNOWING BY DOING'

The Green Schools and Environment Education programme engages with school and college students, teachers and green educators to impart an understanding of environment-development linkages and to provide easy-to-use tools to help practise what is learned. GSP also offers a platform and a network of educators to catalyse cross-learning on the best green practices from different educational institutions and on building education tools for environmental learning.

GREEN SCHOOLS AUDIT

The annual Green Schools Audit provides teachers and students the methodology and tools to audit the resource consumption practices and green infrastructure of their own schools and assess themselves as environmental managers. The audit has six sections: air, energy, food, land, water and waste—together, they aim at providing a holistic picture of resource efficiency.

The programme has been able to bring about measurable changes in practice in schools, such as increase in water table, reduced electricity bills through energy conservation and gradual shift to renewable energy, 100 per cent segregation of waste at source, increased green cover, and move to sustainable modes of transport. GSP has built a strong partnership with state education departments, and with school networks across the country, including in Sikkim, Himachal Pradesh, Andhra Pradesh and Haryana as well as Kendriya Vidyalaya Sangathan (KVS), Navodaya Vidyalaya Samiti, Church of South India, Bharti Foundation, NCERT and Bhavyta Foundation (Maharashtra) among others.

About 6,000 schools from all across India—including some from remote regions—are part of CSE's Green Schools network today. This year's audit received complete reports from 1,704 of these schools—and out of these, 172 made it to the roll of honours. More than 700 teachers participated in GSP workshops.

GSP Awards: 2019 Climate Champions

The audit this year focused on the global threat of climate change. Andhra Pradesh was the top performer this year, with the highest number of schools that registered and submitted audit reports. Chittoor district in the state was adjudged the best—16 schools earned the 'green' tag.

The GSP Awards ceremony is organized every year as a culmination of the rigorous environmental audit exercise that schools undertake between July and November. Through awareness on carbon emissions, clean sources of energy, food consumption, biodiversity, rainwater harvesting and segregation of waste, the 2019 audit paved the path for schools to combat climate change at the local level and progress towards transforming into a sustainable campus.

Of particular interest are the 'Change maker' schools, those that have monitored their resource use over the years and made significant improvements to move towards an efficient manner of functioning. These schools convey the essence of the GSP audit, which is to evaluate, monitor, and improve resource usage over a period of time. This year's change makers were:

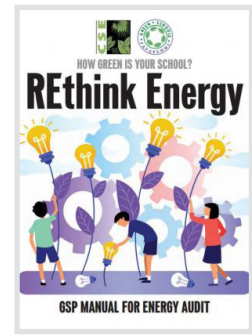
- Montfort Valley Senior Secondary School, Murickumthotty, Kerala
- Satya Bharti School, Bari Khas, UP
- Shivalik Valley School, Solan, Himachal Pradesh
- Senior Secondary School—Chail, Solan, Himachal Pradesh

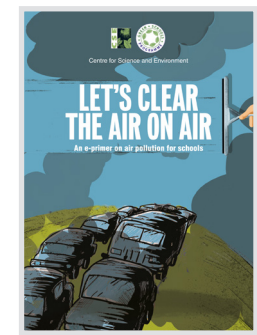
Likewise, 'Green-in-a-row schools' are those that have managed to sustain their green performance for three or more years while continuously moving towards more sustainable means by being environmentally-astute.

- Gyanodaya Vidya Mandir, Damoh, Madhya Pradesh
- East Point School, Delhi
- Mount Litera Zee School, Jamshedpur, Jharkhand
- Salwan Public School, Ghaziabad, UP
- Edmund's School, Jaipur, Rajasthan
- Bal Bharati Public School, IMT Manesar, Haryana
- Motilal Nehru School of Sports, Rai, Haryana
- George's School, New Delhi
- The Pinnacle School, New Delhi
- Bal Bharati Public School, Noida, UP

Engagement with university educators

The university educator network has grown to close to 450 members, comprising college and university faculty members teaching environment and green educators. The programme acts as a knowledge and information network by making members aware about the science and politics of environmental issues in order to stimulate discussions, debates on development patterns, lifestyles, and governance systems in college classrooms. The network helps build capacities of faculty to teach environment in classrooms, provides ready reference material to supplement curricula—such as *Environmental Reader for Universities*, *Climate Change Reader* and the monthly e-newsletter for educators carrying blogs, case studies, video links and environmental coverage—and provides platforms such as the annual Knowledge Conclave, summer courses and webinars to bring alive the vast subject of environment.





National Knowledge Conclave (AAETI, 29–31 January 2020)

The fifth National Knowledge Conclave drew the participation of more than 70 environmental educators, including college and university teachers. Discussions and seminars ranged from status of environmental teaching in higher education and sharing of best practices on pedagogical tools and approaches to make the subject more engaging and relevant. Teachers were exposed to the latest research and debates on pressing environment and development concerns via lectures, seminars, panel discussions and documentaries. Topics were wide ranging in scope and included climate change with special focus on extreme weather events, air pollution and mobility challenges in the developing country context, the spectre of junk food in schools and what it is doing to public health concerns of the youth, solid waste management and sustainable habitats.

Solar in Schools (July–February 2020)

The project to raise awareness on sustainable energy options and to push renewable energy options in schools in Himachal Pradesh included workshops on RE for more than 80 schools, the distribution of do-it-yourself 'solar kits' and a state-wide science fair, in which 37 schools participated from across the state. Based on this initiative, the programme came up with specific recommendations for a national scale-up and implementation of RE in schools, including conducting a science fair, distributing customized solar kits for different class levels, increasing parent engagement, need for data on RE in schools, and also partnering with both the state education department and HIMCOSTE (Himachal Pradesh Council for Science, Technology and Environment, the state's nodal agency for environment education in schools). A workshop and field excursion to explore solar rooftop options for schools was also organized for close to 90 teachers in the state.

MEDIA RESOURCE CENTRE

BUILDING INFORMED PUBLIC OPINION TO INFLUENCE CHANGE

The Media Resource Centre facilitates the dissemination of topical, relevant environmental information and data of public interest, and catalyses wider discussions and debate for informed environmental advocacy in India and the global South, including in Asia and Africa.

It leverages the knowledge and perspective of CSE research and advocacy programmes, convenes sector expertise and thought leadership for informed public discussions, and helps build a cadre of informed and skilled environmental journalists. It does this by using a combination of tools, including issuing press releases and media alerts (a total of 44 in the year) on key issues, organizing briefing workshops for mainstream and regional journalists on topics of concern, using webinars, Facebook Live programmes, e-newsletters and social media posts, and training journalists and development communicators on critical professional skills and facilitating sector exposure.

Media briefings

Three media meetings were conducted in the year. The briefing in Aurangabad convened 50 journalists from Maharashtra and Delhi on the subject of solar pumps, while a skills-and-issues workshop was conducted on Shimla in association with the Shimla Press Club for 80 journalists. The Delhi briefing on air pollution and mobility brought in 50 journalists from Rajasthan, Maharashtra and West Bengal—states in which CSE's clean air programmes are actively engaged.

The UN CoP on Desertification in 2019 was hosted in Delhi. MRC organised a Global South Media Briefing on Desertification (https://www.cseindia.org/global-south-media-briefing-for-indian-african-journalists-9561) for 45 journalists from India and Africa. On internet searches, the CSE meeting itself and the *Down to Earth* special issue on desertification, which was unveiled alongside, occupied higher spots than the UN event. Post-briefing, the participants produced features and feedback, and a WhatsApp group of the participating journalists is continuing a vibrant interaction, sharing news and views almost on a daily basis.

Webinars

This format has been popular, given the Covid -19 pandemic and the 'lockdown' restrictions. Forced into a lockdown scenario since March 2020, CSE's Webinars on environmental issues have provide popular with African media, as they offered platforms for discussing key issues, understanding them in-depth, and developing the skills needed to report on them.

Feature service in Hindi

Given the reduced travel budgets for reporters, and the concomitant lack of credible, ground level reportage, the CSE–Down to Earth Feature Service has proved to be a rich and vetted content source for newspapers and magazines in the Hindi belt. This includes news and feature stories localized to newspapers, as well as data-centric analysis pieces of major global and Indian import. The service reaches out to country's top Hindi newspapers and magazines.

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Dainik Tribune	kevaltiwari@gmail.com
Dainik Jagran	manishtripathi@jagran.com webvarta@gmail.com saeedwebvarta@gmail.com

Engagements with media in Africa and Asia

CSE's Media programme organized media briefings on topical issues by bringing together expert knowledge and perspectives to enhance understanding and reportage; hosted African mainstream and freelance journalists in India to provide country perspective and to expose them to best management practices on water and sanitation; and convened media briefings in select countries on topical themes, in partnership with CSE programme teams. CSE's African media database includes more than 500 active journalists and freelance environmental reporters. CSE is part of an active Pan-Africa network of health and environmental journalists, including the Kenya-based Media for Environment, Science, Health and Agriculture (MESHA) as well as the National Association of Freelance Journalists, which is based out of Zimbabwe.

'The Sanitation Tours—Understanding India's Experiments in Rural Sanitation'

(https://www.cseindia.org/understanding-india-s-experiments-in-rural-sanitation-9799). This was conceptualized as an exposure visit for African journalists who travelled to India and were introduced to India's efforts and initiatives in managing sanitation in its villages. Nine journalists from eight countries were briefed about the CSE perspective, followed by an interaction with a high-level Central government team. The group was also taken on a guided field trip to Churu district in Rajasthan to witness the ground-level work being done there.

Country media briefing: Antibiotics

In collaboration with the food and toxins unit, a meeting of a small group of interested African journalists was organized at a Pan-African Workshop on Anti-Microbial Resistance (AMR). This event was organized in Lusaka (Zambia), and the media cohort was a part of a larger group of participants, which included AMR experts, health professionals, government functionaries and civil society representatives (https://www.cseindia.org/national-action-plans-on-antimicrobial-resistance-9865). A *Down to Earth* special issue on Antimicrobial Resistance (AMR) was released on the occasion. Five outstation journalists from five nations were selected to attend this workshop, along with a few Lusaka-based reporters.

ANIL AGARWAL ENVIRONMENT TRAINING INSTITUTE (AAETI)

TO FIND APPROPRIATE AND AFFORDABLE SOLUTIONS TO SOME OF THE MOST PRESSING PROBLEMS FACED BY DEVELOPING COUNTRIES

CSE's new learning, training and innovation/demonstration centre has been named after the late Anil Agarwal, the Centre's founder-director. The campus is located in Nimli, in Alwar district of Rajasthan, a two-hour drive from Delhi.

AAETI has been fully functional since December 2017, hosting CSE's trainings and workshops. The Institute brings together expertise, knowledge, research and innovative learning tools from across India and the world to build capacities of a range of audiences—regulators, lawmakers, communicators, professionals, students, civil society members and administrators.

During the year, the AAETI hosted 50 training programmes and meetings spread over 202 days in the year, which were attended by 1,493 participants. A total of 13 CSE teams and programmes conducted trainings, workshops and events on a range of environmental topics—from vehicular and industrial pollution, rural and urban water management and sanitation, industry-related topics such as environmental and social impact assessment, conducting environmental audits, aspects of compliance monitoring and enforcement, continuous emission monitoring techniques, smart and affordable monitoring techniques.

The highlight of the year was the Anil Agarwal Dialogue (AAD) in March 2020. The Rajasthan Chief Minister, Ashok Gehlot, attended the inaugural session and released the *State of India's Environment Report, 2020*. The AAD, an annual event, brings together eminent environmental experts in different fields and national and regional media professionals from across the country. It is a forum for journalists to get in-depth understanding of current environmental topics from experts. This year, 137 media professionals attended the event.

There were two other major events in the year—the SFD Conclave in April 2019 and the Knowledge Conclave in January 2020.

The SFD Conclave is an international meeting that brings experts, academicians, officials and NGOs working in the area of urban sanitation to share and discuss current challenges and solutions. The focus of this year's Conclave was on building affordable and sustainable citywide sanitation systems. The Secretary, Ministry of Housing and Urban Affairs, and the Director General of the National Mission for Clean Ganga spoke at the inaugural session of the Conclave, which was attended by over 120 participants.

The Knowledge Conclave is an annual forum for university educators from across the country. The aim is to impart an understanding of current environmental challenges and perspectives to the educators and also to understand from them the problems faced by them in teaching environmental subjects within the university system. It is a highly popular event and participants remain actively engaged and interested in the sessions. Over 70 university educators from across the country attended the Knowledge Conclave.

AAETI's aim is to foster critical and creative thinking so that participants will have the capacity and confidence to find workable solutions to everyday environmental challenges in their professional lives.

AAETI's approach to training is unique in that environmental knowledge and information is embedded within a trans-disciplinary and value-based approach. The classroom atmosphere encourages collaboration and community learning and pedagogy is backed by learning by doing methods and experiential learning. Most training workshops are enhanced with field trips that connect the classroom theoretical learning with practical action. A host of eminent subject experts contribute to add value to the trainings.

Topic-wise trainings

16 345 Industry related trainings	12 280 Urban water and wastewater management	5 128 Rural sanitation
5 142 Sustainable habitat	2 31 Environmental testing tools and methodologies	2 114 Environmental perspectives for educators
2 29 Urban solid waste management	3 85 Air quality management	

Total 47 1154

Meetings conducted at AAETI

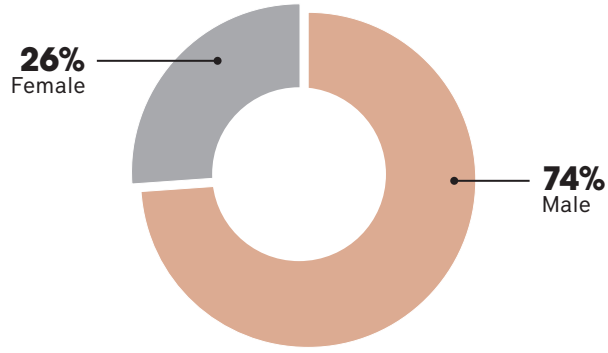
1 137 Anil Agarwal Dialogue	1 120 Shit Flow Diagram Conclave	1 82 Knowledge Conclave

Total 3 339

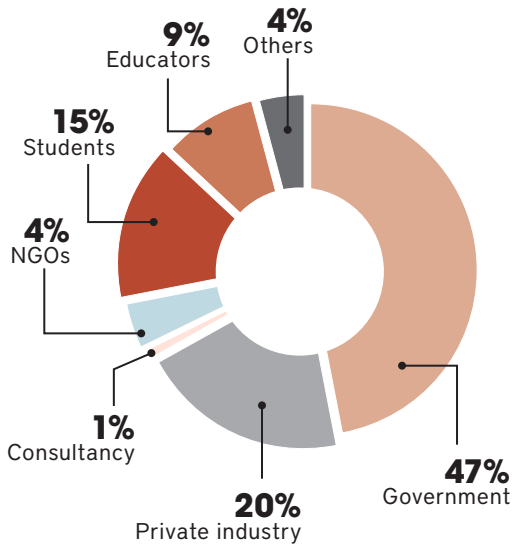
Number of trainings **Number of participants**

Total particpants in trainigs and events hosted in AAETI (2019–20) = 1,493
International participants = 147 (10 per cent of total)

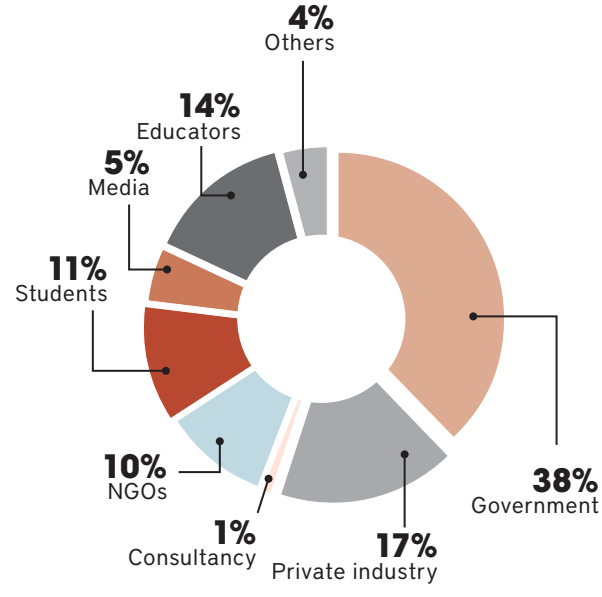
Snapshot of participants by gender



Training participants by type of organization (2019–20)



Event participants at AAETI by type of organization (2019–20)



ANNEXURES
KEY OUTPUTS

Clean Air and Sustainable Mobility

Key outputs

PUBLICATIONS

- Draft Clean Air Action Plan for Addis Ababa (printed and submitted to EFCCC, Ethiopia)
- National Urban Transport Policy for Nigeria (draft)

WORKSHOPS / MEETINGS

- Stakeholder Workshop on Clean Air Action Plan for Addis Ababa, 11–12 November 2019, Addis Ababa, Ethiopia
- Stakeholder Workshop on Clean Air Action Planning Strategies and Implementation in Nigeria, 25 February 2020, Abuja, Nigeria
- Meeting with Ms. Frenesh Mekuria Gobena, Deputy Commissioner, Environment, Forest and Climate Change Commission (EFCCC), Democratic Republic of Ethiopia, 11 November 2019 at EFCCC office, Addis Ababa, Ethiopia
- Meeting with Mr S. Zakari, Permanent Secretary, Federal Ministry of Transportation (FMoT) and Dr Anthonia Ekpa, Director, FMoT, Federal Republic of Nigeria, 25 February 2020 at FMoT office, Abuja, Nigeria
- Meeting with Mr Wadata Bodinga, Director, Directorate of Road Traffic Services (DRTS), Federal Republic of Nigeria, February 28 2020 at DRTS office, Abuja, Nigeria

PRESENTATIONS

- CSE presentation on Setting the agenda for Dialogue on air quality management in Ethiopia delivered in 11–12 November 2019 stakeholder workshop in Addis Ababa
- CSE presentation on Towards Clean Air Action Plan 0n 25 February 2020 stakeholder workshop in Abuja

Industrial Pollution Programme

Key outputs (Global)

WORKSHOPS, MEETINGS, CONCLAVES

- Indonesia advocacy meetings for SRT and coal, Jakarta, 22–24 May 2019: One-on one-meetings with RE head of Ministry of Energy and Mineral Resources, head of Indonesian Solar Energy Association, and project developers.
- Meeting with MoEF, Indonesia, June 2019,

REPORTS, POLICY BRIEFS

- Policy note: Emission standard (Mandvi Singh, Priyavrat Bhati), CSE, 2019

Key outputs (India)

PUBLICATIONS

- Benefit Sharing in the Mining Sector in Africa (Vikrant Wankhede, Lady Vanessa Reyes and Arjunvir Kol Chak, Centre for Science and Environment (CSE), 2020
- EIA Guidelines on Building and Construction Sector (draft submitted to the National Environmental Management Council, NEMC)
- Terms of Reference for Mining Projects (draft submitted to the National Environmental Management Council, NEMC)
- Terms of Reference for Industrial Projects (draft submitted to the National Environmental Management Council, NEMC)
- EIA Guidelines for Linear Projects (draft submitted to the National Environmental Management Council, NEMC)
- Environmental Impact Assessment Screening Framework submitted to Ministry of Environment and Tourism, MET)
- EIA Guidelines for Mining Projects for Ministry of Mines and Energy
- Development of Action Plan for the Polluted River Stretches (Draft)
- A policy roadmap to develop smart and affordable monitoring systems in Ethiopia—Policy Paper (Draft)
- Environmental Audit Manual for Ethiopia (Draft)

- Environmental Audit Manual for Ghana (Draft)
- Note: Emission standards

CAPACITY BUILDING/TRAINING

- Environmental and Social Impact Assessment in Mines (in partnership with the World Bank under the ZMERIP initiative)
- Environmental Impact Assessment (AAETI, 24–28 June 2019)
- Land Acquisition: Rehabilitation and Resettlement (AAETI, 15–19 July 2019)
- Hazardous Waste Management (AAETI, 27–30 Aug. 2019)
- Environmental Impact Assessment (AAETI, Nov. 18-22, 2019)
- Environmental Impact Assessment (AAETI, 24–28 Feb. 2020)
- Environmental Impact Assessment (for ICFRE officials, AAETI, 2–6 March 2020)
- Environmental and Social Impact Assessment in Mines based on the EIA [Amendment] in Tanzania (Dar-Es-Salaam, Tanzania, 19–21 Aug. 2019)
- EIA, its review, inspection and EMP compliance (Windhoek, Namibia, 29 July–1 Aug. 2019)
- EIA, its review, inspection and EMP compliance (Windhoek, Namibia, 4–8 Nov. 2019)
- Development of action plan for the polluted stretches along the Awash Basin (Addis Ababa, Ethiopia, 25–27 July 2019)

MEETINGS

- Consultation meeting on EIA Guidelines on Linear Projects (Dar-Es-Salaam, Tanzania, 22–23 Aug. 2019)
- Meeting on Screening Criteria for Project Categorization (Windhoek, Namibia, 2 Aug. 2019)
- Meeting on EIA Guidelines for Mining Projects with Ministry of Mines and Energy (Windhoek, Namibia, 5 Aug. 2019)
- Consultation meeting for finalization of Environmental Audit Manual (Accra, Ghana, 21–25 Oct. 2019)
- Consultation meeting on developing various aspects of the proposed action plan for polluted river stretches (Addis Ababa, Ethiopia, 25–27 July 2019)
- Meeting with MoEF, Indonesia (Jakarta, Indonesia, June 2019)

Sustainable Water Management and Sanitation

Urban Water And Waste Programme

Key outputs (Global)

TRAININGS

- Training Programme on Water Sensitive Urban Design and Planning (Potchefstroom, South Africa, 4–6 Sept. 2019) https://www.cseindia.org/training-programme-on-water-sensitive-urban-design-and-planning-9696
- Training Programme on Water Sensitive Urban Design and Planning (Modimolle, South Africa, 9–11 Sept. 2019) https://www.cseindia.org/training-programme-on-water-sensitive-urban-design-and-planning-9695
- Training on SFD Phase- III South Asia Launch Event (Dhaka, Bangladesh, 12 Feb. 2020) https://www.cseindia.org/sfd-phase-iii-south-asialaunch-event-9942
- Pan-Africa: Training of regulators and consultants (including Ghana officials) on SFDs and faecal sludge management from cross learning platforms to build engagement.

EVENTS

- Round-Table Meeting on Wastewater and Faecal Sludge Management (Accra, Ghana, 6 Sept. 2019) https://www.cseindia.org/round-table-meeting-on-wastewater-and-faecal-sludge-management-held-in-accra-9690

PUBLICATIONS

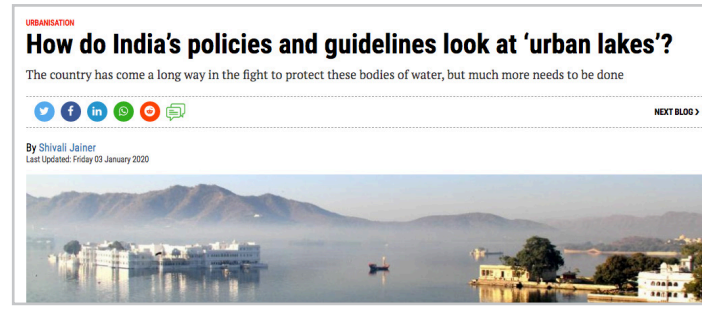
- Integrated Wastewater and Faecal Sludge Management for Ghana (Dr Suresh Rohilla, Francis Boateng Agyenim, Bhitush Luthra, Shantanu Kumar Padhi, Andrews Selom Quashie and Anil Yadav; December 2019 (https://cdn.cseindia.org
- Guidelines (draft for discussion) on integrated wastewater and faecal sludge management in Ghana (draft, developed by CSE in collaboration with (CSIR-IIR, Ghana)
- Potential of Rainwater Harvesting in Rwanda (Dr Suresh Rohilla, Mahreen Matto, Shivali Jainer; 2019; Centre for Science and Environment, Rwanda Water and Forest Authority). (https://waterportal.rwfa.rw/sites/default/files/2019-04/Potential%20of%20Rainwater%20Harvesting%20in%20Rwanda%20report-Final.pdf).

Key outputs (India)

- Practitioner's Guide on Decentralized Wastewater Management
- Practitioner's Guide on Lake Management
- Research report: Stormwater Management
- Research report: Water and Sanitation: What Works and what Not

DOWN TO EARTH
ARTICLES/BLOGS

- Wastewater resource, not liability: Moving towards circular economy (https://www.downtoearth.org.in/blog/water/wastewater-resource-not-liability-moving-towards-circular-economy-69728)
- Urban flooding around the world: Where is India placed? (https://www.downtoearth.org.in/blog/water/urban-flooding-around-the-world-where-is-india-placed--70765)
- Delhi's Sangam Vihar needs to use its natural drainage to solve waterlogging (https://www.downtoearth.org.in/blog/water/delhi-s-sangam-vihar-needs-to-use-its-natural-drainage-to-solve-waterlogging-69459)
- Urban lake: A reflection of its watershed (https://www.downtoearth.org.in/blog/water/urban-lake-a-reflection-of-its-watershed-69199)
- How do India's policies and guidelines look at 'urban lakes'? (https://www.downtoearth.org.in/blog/urbanisation/how-do-india-s-policies-and-guidelines-look-at-urban-lakes--68662)
- India needs to conserve waterbodies and value them (https://www.downtoearth.org.in/blog/water/india-needs-to-conserve-waterbodies-and-value-them-65998)
- India's water crisis: The clock is ticking (https://www.downtoearth.org.in/blog/water/india-s-water-crisis-the-clock-is-ticking-65217)
- Will Indian cities again drown this monsoon? (https://www.downtoearth.org.in/blog/urbanisation/will-indian-cities-again-drown-this-monsoon--64755)
- Schools need a roadmap for rainwater harvesting (https://www.downtoearth.org.in/blog/water/schools-need-a-roadmap-for-rainwater-harvesting-64547)
- Rainwater harvesting: Way ahead to encash the alternative water resource (https://www.downtoearth.org.in/blog/water/rainwater-harvesting-way-ahead-to-encash-the-alternative-water-resource-64511)
- Faecal sludge and septage management key for a clean Ganga (https://www.downtoearth.org.in/blog/india/faecal-sludge-and-septage-management-key-for-a-clean-ganga-67124)
- Why building sewage treatment plants in cities on the Ganga is a challenge (https://www.downtoearth.org.in/news/waste/why-building-sewage-treatment-plants-in-cities-on-the-ganga-is-a-challenge-67120)
- Swachh Bharat Mission: Need focus on citywide sanitation, clean Ganga (https://www.downtoearth.org.in/blog/water/swachh-bharat-mission-need-focus-on-citywide-sanitation-clean-ganga-67235)
- Excreta as resource: Looking at recovery, reuse of faecal sludge in UP (https://www.downtoearth.org.in/blog/rural-water-and-sanitation/excreta-as-resource-looking-at-recovery-reuse-of-faecal-sludge-in-up-71419)
- Can we declare ourselves ODF, without managing the collected excreta? (https://www.downtoearth.org.in/blog/water/can-we-declare-ourselves-odf-without-managing-the-collected-excreta--67270)
- Is the Ganga basin drowning in shit? (https://www.downtoearth.org.in/blog/rural-water-and-sanitation/is-the-ganga-basin-drowning-in-shit--67107


URBANISATION

How do India's policies and guidelines look at 'urban lakes'?

The country has come a long way in the fight to protect these bodies of water, but much more needs to be done

NEXT BLOG >

By Shivali Jainer
Last Updated: Friday 03 January 2020


WATER

Delhi's Sangam Vihar needs to use its natural drainage to solve waterlogging

There is a need to look at informal settlements like Sangam Vihar as part of a larger drainage basin while conserving the natural topography

NEXT BLOG >

By Shivali Jainer, Dhruv Pasricha
Last Updated: Tuesday 25 February 2020


WATER

Schools need a roadmap for rainwater harvesting

Despite school rooftops and playgrounds being the best places for rainwater harvesting, many institutions are unable to implement the system owing to lack of expertise

NEXT BLOG >

By Shivali Jainer
Last Updated: Wednesday 15 May 2019

FIELD EXCURSIONS

- The Sanitation Tours: Understanding India's Experiments in Rural Sanitation (CSE, Delhi, Churu and AAETI, Rajasthan, 20–24 January 2020)

WORKSHOPS, MEETINGS, CONCLAVES

- Meeting and release of report, Nigeria: Improving the State of Sanitation (Abuja, Nigeria, 3 December 2019)

REPORTS, POLICY BRIEFS

- Nigeria: Improving the State of Sanitation (Sunita Narain, Sushmita Sengupta, Rashmi Verma and Heli Shah, 2019, Centre for Science and Environment, New Delhi)

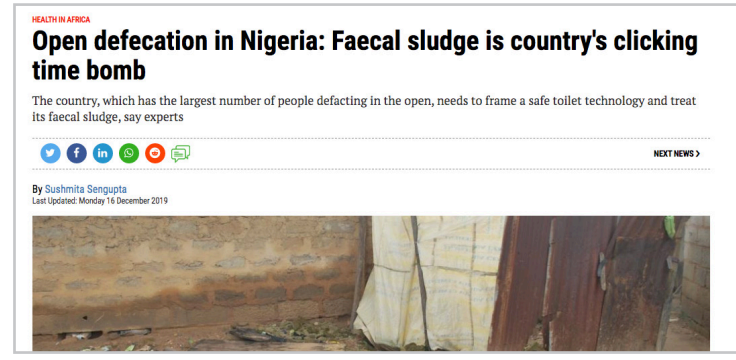
TRAININGS ON SUSTAINABLE RURAL SANITATION: INDIA WORK

- Training for government, non-profit and private organizations (AAETI, Nimli, Rajasthan, 3–6 Feb. 2020)
- Training for Karnataka goverment officials (AAETI, Nimli, Rajasthan, 24–28 Sept. 2019)
- Training for Karnataka govt. officials (AAETI, Nimli, Rajasthan, 5–9 Aug. 2019)
- Training for Karnataka govt. officials (AAETI, Nimli, Rajasthan, 21–25 May 2019)

Rural Water And Waste Programme

DOWN TO EARTH ARTICLES/BLOGS

- Can white faecal pellets take over as the future fertiliser in global south? htwtps://www.downtoearth.org.in/news/waste/can-white-faecal-pellets-take-over-as-the-future-fertiliser-in-global-south--63776
- After India becomes ODF, Nigeria faces a mounting challeng https://www.downtoearth.org.in/news/health-in-africa/after-india-becomes-odf-nigeria-faces-a-mounting-challenge-63833
- Does rural India have enough water to sustain open-defecation free status? https://www.downtoearth.org.in/news/water/does-rural-india-have-enough-water-to-sustain-open-defecation-free-status--63898
- All that crap: How can faecal sludge be reused https://www.downtoearth.org.in/blog/water/all-that-crap-how-can-faecal-sludge-be-reused-64040
- Is the world ready to meet the SDG target on sanitation? https://www.downtoearth.org.in/news/waste/is-the-world-ready-to-meet-the-sdg-target-on-sanitation--65238
- Successful project made women water entrepreneurs instead of water carriers https://www.downtoearth.org.in/news/rural-water-and-sanitation/successful-project-made-women-water-entrepreneurs-instead-of-water-carriers-66503


HEALTH IN AFRICA

Open defecation in Nigeria: Faecal sludge is country's clicking time bomb

The country, which has the largest number of people defacting in the open, needs to frame a safe toilet technology and treat its faecal sludge, say experts

NEXT NEWS >

By Sushmita Sengupta
Last Updated: Monday 16 December 2019

- Govt shifts focus to sustaining sanitation coverage https://www.downtoearth.org.in/news/rural-water-and-sanitation/govt-shifts-focus-to-sustaining-sanitation-coverage-66649
- Swachh Bharat Mission: 'Inducing behavioural change was a task' https://www.downtoearth.org.in/interviews/water/swachh-bharat-mission-inducing-behavioural-change-was-a-task--67016
- Open defecation in Nigeria: Faecal sludge is country's clicking time bomb https://www.downtoearth.org.in/news/health-in-africa/open-defecation-in-nigeria-faecal-sludge-is-country-s-clicking-time-bomb-68457
- Swachh Bharat Mission: Nilgiris sets example of community effort https://www.downtoearth.org.in/news/water/swachh-bharat-mission-nilgiris-sets-example-of-community-effort-67008
- Niligiris' journey to being ODF led to it embracing organic farming https://www.downtoearth.org.in/news/rural-water-and-sanitation/niligiris-journey-to-being-odf-led-to-it-embracing-organic-farming-66770
- Swachh Bharat Mission: Persuasion pays off in Uttar Pradesh https://www.downtoearth.org.in/news/rural-water-and-sanitation/swachh-bharat-mission-persuasion-pays-off-in-uttar-pradesh-67004
- Union Budget 2019-20: Focus shifts to SBM phase 2, women's role in it https://www.downtoearth.org.in/news/waste/union-budget-2019-20-focus-shifts-to-sbm-phase-2-women-s-role-in-it-65470
- Lack of access to sanitary products, privacy drives girls away from schools in Zambia

Climate Change
Key outputs

WORKSHOPS

- Side-event at UN Desertification COP on 'Climate co-Benefits of Programmes to Combat Land Degradation' (New Delhi, 3 Sept. 2019)
- Global South Media Briefing on Desertification, to be held on 5–8 September 2019 (co-hosted by CSE media unit)

PUBLICATIONS, REPORTS

- Report: State of US emissions and Consumption
- Factsheets: Nationally Determined Contributions, Carbon Markets, and Net Zero to inform deliberations at COP25
- Agrometeorological Advisories in India: An Assessment (Tarun Gopalakrishnan and Kapil Subramanian 2020, Centre for Science and Environment, New Delhi)

DOWN TO EARTH REPORTAGE

- Bernie Sanders, Joe Biden differ deeply on climate justice, common sense
- EU cannot use 'nature-based solutions' to make up for lack of emissions cuts
- IEA's push for climate ambition must start at home
- 2020 Climate Targets: The Paris Agreement legally requires better targets this year
- Economic Survey 2019-20: Need was to get serious about climate crisis
- Adani Carmichael coal: Do we need it or not?
- Do India's poor need coal from Adani's Carmichael mine?
- A just transition away from coal is in the offing
- Climate Emergency CoP 25: A failure on key deliverables
- Climate Emergency CoP 25: Decent outcome on 2020 Ambition
- CoP 25: Marginal improvements in new text on Article 6 Sustainable Development Mechanism
- Climate Emergency CoP 25: New proposal by CoP Presidency will undermine next round of climate targets
- Climate Emergency CoP 25: Negotiators in Madrid forced to look back before moving forward
- Climate Emergency CoP 25: The European Green Deal is far from good enough
- Climate Emergency CoP 25: 70% of top polluting countries failed to meet GHGs reduction target
- Climate Emergency CoP 25: India is the only major economy to be '2 degree compatible'
- Climate Emergency CoP 25: Why 2020 is a critical year for the planet
- Climate Emergency CoP 25: Developed countries have already exhausted the Earth's carbon budget
- Climate Emergency CoP 25: Will the world be net carbon zero by 2050
- Climate Emergency CoP 25: Technologies being experimented to become net zero carbon
- Climate Emergency CoP 25: The Adaptation Fund is perfectly fit to serve the Paris Agreement
- Climate Emergency CoP 25: The Paris Agreement is tilting into a downward spiral
- जलवायु आपातकाल, कॉप–25 : क्या सचमुच नेट कार्बन एमशिन शून्य हो जाएगी दुनिया?
- Climate Emergency CoP 25: What to expect from the second week
- Climate Emergency CoP 25: Technicalities of carbon markets continue to evade consensus
- Climate Emergency CoP 25: New platform linking oceans and climate launched in Madrid
- जलवायु आपातकाल, कॉप–25 : विकसित देशों ने पहले ही खत्म कर दिया अपने हिस्से का कार्बन बजट
- कृषि की बुरी दशा व खानपान की आदतों की वजह से जलवायु परिवर्तन में तेजी आई : आईपीसीसी
- Climate Emergency CoP 25: A storm is brewing on 'Loss and Damage'
- Climate Emergency CoP 25: Developed countries have largely consumed world's carbon budget
- Climate Emergency CoP 25: Can the world reduce its greenhouse emissions to zero by 2050?
- Climate Emergency CoP 25: What exactly are carbon markets?
- Climate Emergency CoP 25: World to warm by 3.2°C
- जलवायु आपातकाल, कॉप–25 : प्रदूषण फैलाने वाले देश नहीं कर पाए कार्बन उत्सर्जन का लक्ष्य हासिल
- Climate Emergency CoP 25: UN member states continue to default on payments
- जलवायु आपातकाल, कॉप–25 : दुनिया के लिए वर्ष 2020 अहम क्यों है?
- जलवायु आपातकाल कॉप–25 : भारत ही हासिल कर सकता है दो डिग्री सेल्सियस का लक्ष्य
- World must cut annual emissions by 7.6% till 2030 to meet 1.5°C target: UNEP
- The UN Production Gap report clarifies the need for fossil fuel non-proliferation
- Making agriculture sustainable is good and not for climate alone
- Only 13 of 132 largest energy cos committed to net zero emissions: Study
- https://www.downtoearth.org.in/climate-changeThe Green Climate Fund must be a champion for real sustainability
- The next round of climate targets will worsen the crisis
- Why State of New York vs ExxonMobil Corp is crucial for climate action
- International Monetary Fund, pension funds and climate: The heat is on
- Why Global Hunger Index also

flags climate change
- The world is warming and we don't know how much carbon can it take
- UNFCCC Pre-COP: Restoring faith needs proactive agenda on loss and damage
- https://www.downtoearth.org.in/climate-changeOn climate, focus on what Putin does, not what he says
- Sustainable climate policy cannot dodge the question of consumption
- Climate summit in New York: Why it's happening and what to expect
- Trump's battle with California busts myths about American climate policy
- Poor agri, dietary practices have intensified climate change: IPCC
- 2020 US elections: No Democrat candidate offers bold plan for climate action
- Planting forests no panacea for the climate crisis: IPCC
- 2020 US polls: How Democrats plan to tackle climate change
- Climate talks need to re-focus on target-setting
- How to deal with extreme heat: Move beyond emergency mode
- COP24: Negotiators happy to agree on the basics, but not on long-term vision
- COP24: Long-term vision for climate finance missing at Katowice
- COP24: BASIC willingness to be transparent must bring Katowice consensus closer
- COP24: Proactive, support-focused approach required, says CSE
- COP24: A principled debate on adaptation communications
- https://www.downtoearth.org.in/climate-changeCOP24: Nationally determined contributions and search for common time frames in Katowice
- Katowice offers last chance
- BASIC Ministerial on Climate Change: India calls for developed countries to step up at Katowice
- A comprehensive GHG inventory for India is within reach
- IPCC 1.5 Report: Mitigation pathways clear, but countries need to commit
- How will climate change affect carbon sequestered in tropical forests?
- New CoP 26 Glasgow president: Alok Sharma distracts from national ambition
- Draft EU climate law: Too little ambition, net-zero target too late
- Draft EU Climate Law: Incomplete framework, poor on internationalism
- Innovation may not be the answer to India's development challenges
- BP and British media must stop green-washing
- Getting Amazon to pay its taxes could be Jeff Bezos' biggest climate action
- New CoP president's first foreign engagement disappoints
- Smoking gun letter reveals British CoP president's 7-point climate action plan
- Climate emergency: A question of semantics?
- Obituary: Rajendra Kr Pachauri: (20 August, 1940 - 13 February, 2020)
- Ed Miliband makes a potentially transformative pitch for CoP 26 Glasgow presidency
- Prince Charles pushed markets over State at Davos
- Indian Railways needs to look beyond its world-leading net zero target
- DTE analysis leads to sacking of British CoP president
- Economic Survey 2019-20: A radical deregulation agenda of poor economics and poorer economic history
- Budget 2020-21: Climate Change must be mainstreamed
- Extinction Rebellion needs to build solidarity and work on its race problem
- Europe's biomass problem
- Climate Emergency CoP 25: India's mixed role
- Climate Emergency CoP 25: Ranking of top climate change performers disregards consumption question
- Climate Emergency CoP 25: New index makes scathing critique of climate laggards
- Climate Emergency CoP 25: India must release its 2005 baseline emissions data
- Climate Emergency CoP 25: Europe's Kafkaesque progress on climate action
- Climate Emergency CoP 25: The inadequacy of net zero
- Climate Emergency CoP 25: 70% of top polluting countries failed to meet GHGs reduction target
- Climate Emergency CoP 25: India is the only major economy to be '2 degree compatible'
- Climate Emergency CoP 25: Why 2020 is a critical year for the planet
- Climate Emergency CoP 25: Developed countries have already exhausted the Earth's carbon budget
- Climate Emergency CoP 25: Will the world be net carbon zero by 2050
- Climate Emergency CoP 25: Technologies being experimented to become net zero carbon
- Denmark's new climate law could potentially be world-leading but does not go far enough
- जलवायु आपातकाल, कॉप-25 : क्या सचमुच नेट कार्बन एमिशन शून्य हो जाएगी दुनिया?
- Climate Emergency CoP 25: EU

not on track to meet its Paris commitments
- Run-up to CoP25 Santiago: Are global transport emissions on course?
- Influential new report abandons principle of Common But Differentiated Responsibility
- जलवायु आपातकाल, कॉप-25 : वकिसति देशों ने पहले ही खत्म कर दिया अपने हिस्से का कार्बन बजट
- Climate Emergency CoP 25: Large sections of western media insensitive to equity question
- Climate Emergency CoP 25: What leaders will discuss at the meet
- Climate Emergency CoP 25: Developed countries have largely consumed world's carbon budget
- Climate Emergency CoP 25: Can the world reduce its greenhouse emissions to zero by 2050?
- Climate Emergency CoP 25: What exactly are carbon markets?
- Climate Emergency CoP 25: World to warm by 3.2°C
- Climate Emergency CoP 25: Climatic tipping point is closer than we think
- जलवायु आपातकाल, कॉप-25 : प्रदूषण फैलाने वाले देश नहीं कर पाए कार्बन उत्सर्जन का लक्ष्य हासिल
- जलवायु आपातकाल, कॉप-25 : दुनिया के लिए वर्ष 2020 अहम क्यों है?
- Climate Emergency CoP 25: Saudi Arabia to delay oil fossil fuel phase-out
- जलवायु आपातकाल कॉप-25 : भारत ही हासलि कर सकता है दो डग्रिी सेल्सयिस का लक्ष्य
- Climate Emergency CoP 25: A gap that keeps growing
- Global industrial emissions: Steeling through?
- New Zealand's new climate change law: Inadequate and not really net zero
- African cities call for local climate action, adaptation finance
- Is India on track to meet its Paris commitments
- US not doing its bit to reduce emissions
- 2020 US elections: No Democrat candidate offers bold plan for climate action
- 2020 US polls: How Democrats plan to tackle climate change
- How green is the urea sector?

Renewable Energy
Key Outputs

WORKSHOPS, MEETINGS, CONCLAVES

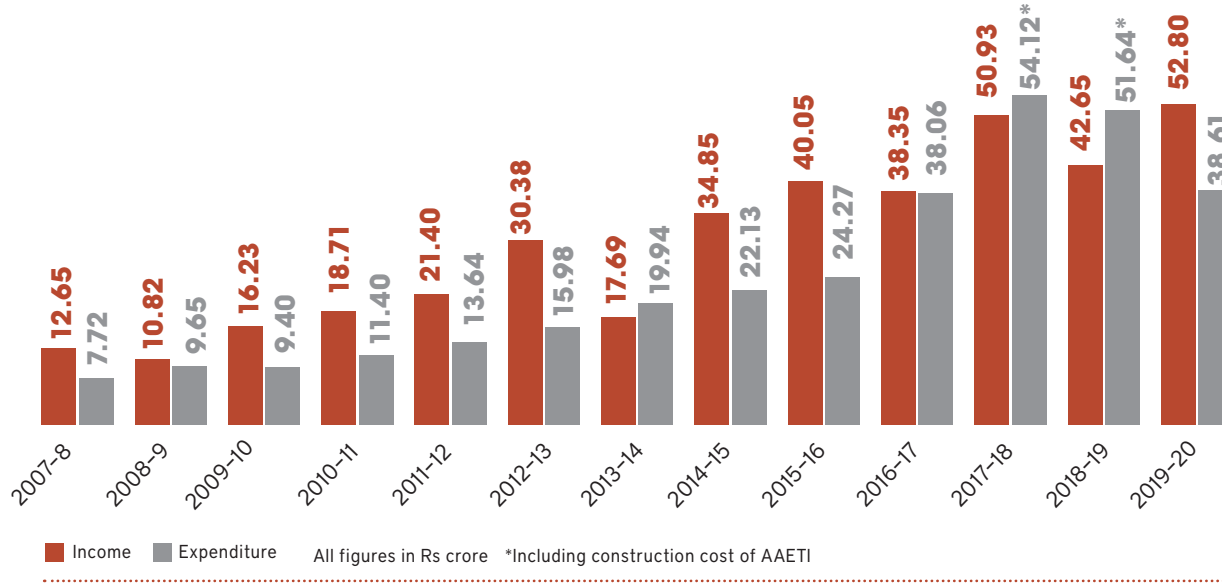
- Indonesia advocacy meetings for SRT and coal, Jakarta, May 22-24, 2019: One-on one-meetings with RE head of Ministry of Energy and Mineral Resources, head of Indonesian Solar Energy Association, and project developers.
- Tanzania RE meeting, Dar-es-Salam, 8 October 2019, 22 (16/6) [Link: https://www.cseindia.org/promoting-renewable-energy-in-tanzania-9728]

REPORTS, POLICY BRIEFS

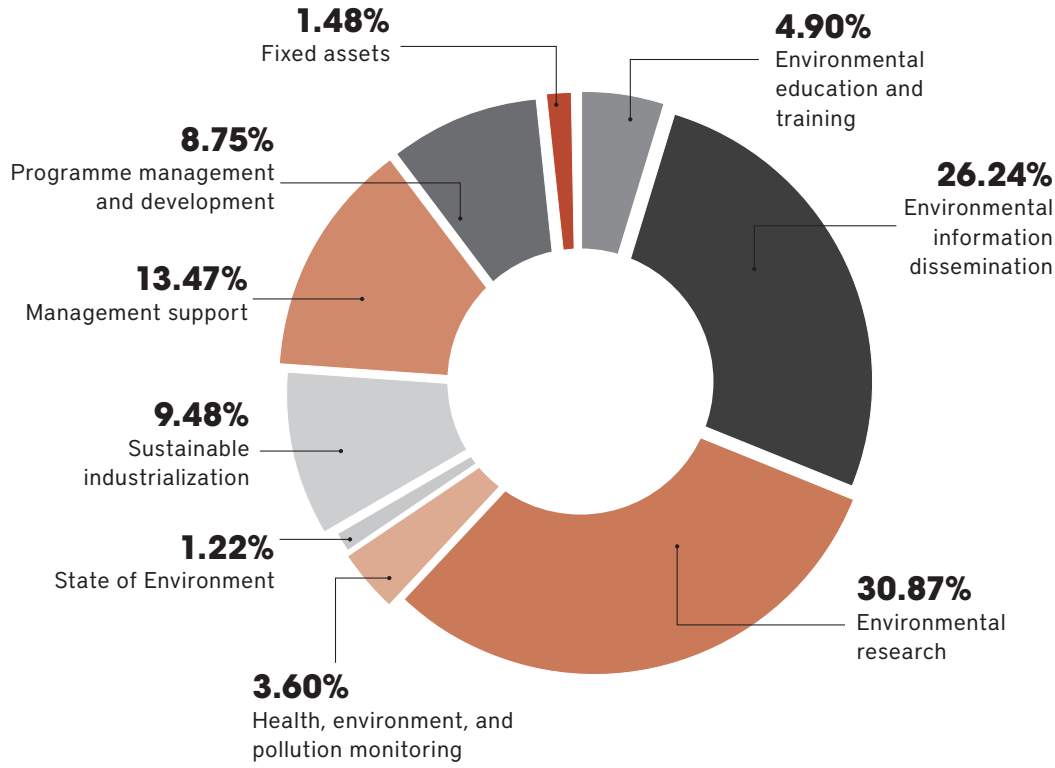
- Tanzania Draft RE Strategy Paper, By Priyavrat Bhati, Mandvi Singh and Shweta Miriam Koshy, 2019

FINANCIAL REPORT

Income and expenditure in FY 2019–20



Expenditure in FY 2019–20



List of donors 2019–20

Bill & Melinda Gates Foundation

Bread for the World

Charities Aid Foundation India

Children's Investment Fund Foundation

GIZ

Heinrichh Boll Stiftung

John D. and Catherine T. MacArthur Foundation

Katholische Zentralstelle fur Entwicklungshilfe e. V.

Ministry of Environment and Forests & Climate Change - Ozone Cell

Oak Foundation

Shakti Sustainable Energy Foundation

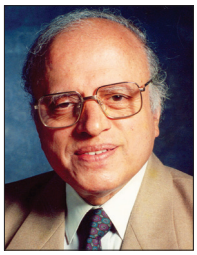
Sisters of Charity of Nazareth

Swedish International Development Cooperation Agency

Individual donors: 2019–20

Aditya Veer | Amit Langoo | Archana Singh | Arun Rathore | Ashish Shukla | Avijit Bhunia | Bishwanath Prasad | Chhathu Choudhary | Divvya Behal | Gautam Buddha Bagai | Gopikrishna Vunnam | Jayanta Topadar | Kamal Suchetan | Kusumakar Pakalapati | Manik Kar | Manohar Chandel | Manoj Harinath Jeswar | Mintu Paul | Navneet | Navneet Aggarwal | Nimisha | Nitin Bharat Pawar | Parag More | Prajith Kumar Pillai | Pranjal Agarwal | Prasanta | Kumar Barman | Praveen Alluri | Rahul Pawal | Ravi Kumar | Ravi Roshan Verma | S. Patri | Savez Sheikh | Sudhir Kothagunda | Tushar Prabhu | Vijay Simha | Vivek Pandey

Executive board



M.S. Swaminathan

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.

William Bissell

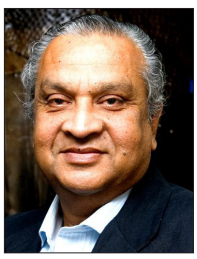
has been closely associated with the Centre for Science and Environment for many years. He is the Managing Director of FabIndia, a company that has made a signal contribution in popularising handlooms nationally and internationally.

He is deeply interested in issues of environment and sustainable development. Besides CSE, he is also involved with other non-profit organizations. William Bissell is the Managing Trustee of the Bhadurajun Artisan Trust, which runs schools in Rajasthan to bring quality education to the artisanal families living in rural areas.

G.N. Gupta

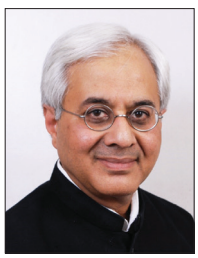
joined the Board of CSE in 1998 and is among the core group that provides guidance on institutional development issues, particularly on financial issues.

As a member of the Indian Revenue Service, he has 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.



Raj M.S. Liberhan

Raj Liberhan, 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.



A.K. Shiva Kumar

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

Prof. Ramaswamy Sudarshan 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 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

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 organizations in India.

Sunita Narain

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 organizations and on governmental committees and has spoken at many forums across the world on issues of her concern and expertise.

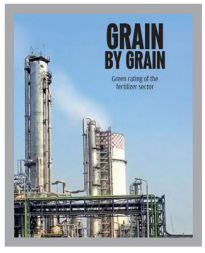
Sunita Narain has devoted a great deal of her time to develop the management and financial support systems needed to make CSE strong and sustainable. She has greatly contributed to the institution of management systems that ensure that CSE produces quality work consistently.

Jagdeep Gupta

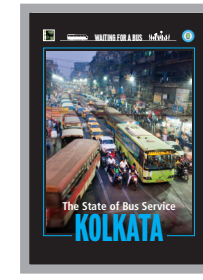
is currently the Executive Director, Planning and Operation. She brings a rare and befitting mix of a pure science background with a degree in management, indispensable to understanding the nature of work and the ethos behind an organization like CSE. Over the years she has shown her excellence in acquiring 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.

CSE Publications (April 2019–March 2020)

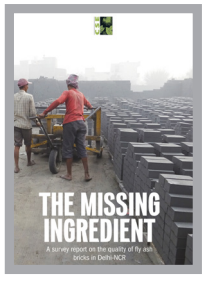
A SELECTION FROM THE OVER 100 TITLES PUBLISHED IN THIS PERIOD



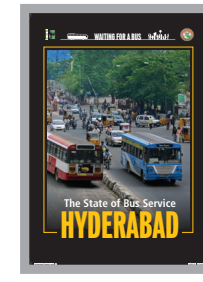
Grain by Grain: Green Rating of the Fertilizer sector



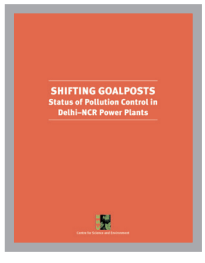
The State of Bus Service: Kolkata



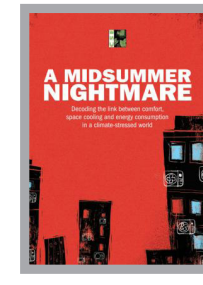
The Missing Ingredient: A Survey Report on the Quality of Fly Ash Bricks in Delhi-NCR



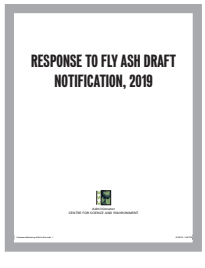
The State of Bus Service: Hyderabad



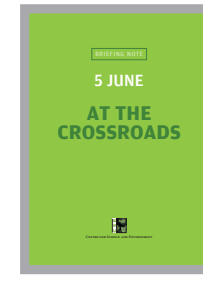
Shifting Goalposts: Status of Pollution Control in Delhi–NCR Power Plants



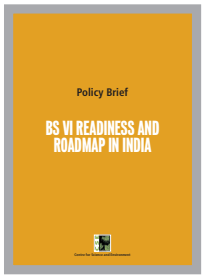
A Midsummer Nightmare



Response to Notification (Fly ash report 2

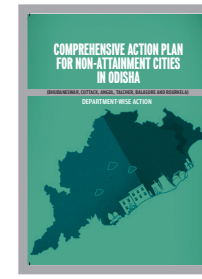


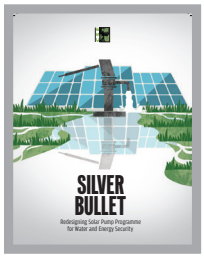
Briefing Note: 5 June: At the Crossroads



BS VI readiness and roadmap in India

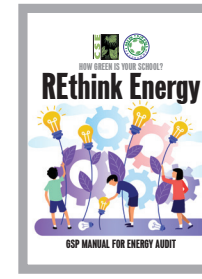
Comprehensive Action Plan for Non-Attainment Cities (Odisha; department-wise pointers)

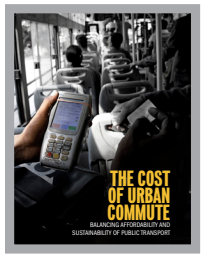




Silver Bullet: Are Solar Pumps a Panacea for Irrigation, Farmer Distress and Discom Losses?

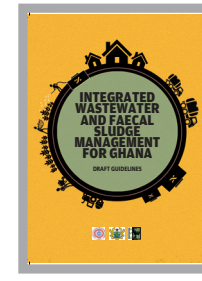
REthinking Energy: GSP Manual for Energy





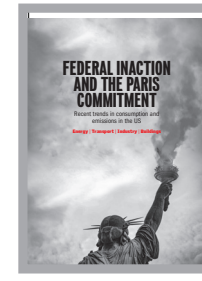
The Cost of Urban Commute

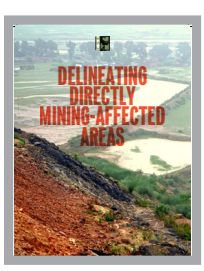
Ghana: Integrated Wastewater and Faecal Sludge Management: Draft Guidelines



Deforestation, desertification and land degradation: Is it time for a unified land-based carbon sink mechanism?)

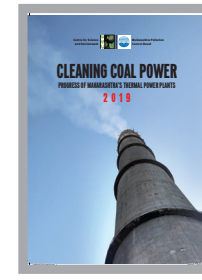
Federal Inaction and the Paris Commitment

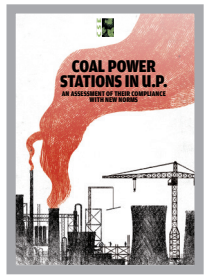




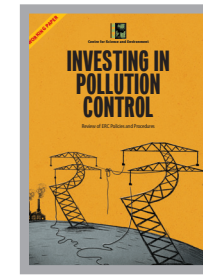
Delineating Directly Mining-Affected Areas

Cleaning Coal Power: Progress of Maharashtra's Thermal Power Plants

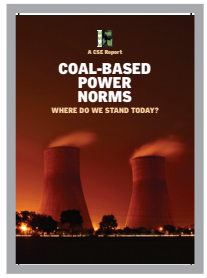




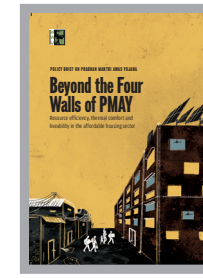
Fact Sheet: Coal power stations in U.P: An assessment of their compliance with new norms



Report: Investing in Pollution Control: Review of ERC Policies and Procedures



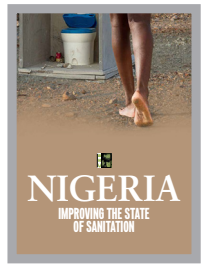
Report: 'Coal-Based Power Norms: Where do we stand today'



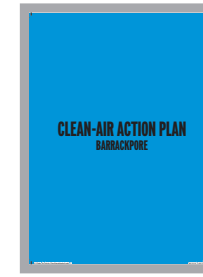
Beyond the Walls of PMAY: Resource efficiency, thermal comfort and liveability un the affordable housing sector

A policy roadmap to develop smart and affordable monitoring systems in Ethiopia (draft policy paper)

Kalinganagar: Clean Air Action Plan



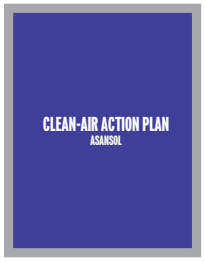
Nigeria: Improving the State of Sanitation



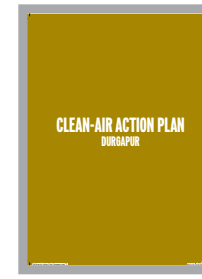
Clean Air Action Plan: Barackpore

Clean Air Action Plan: Raniganj

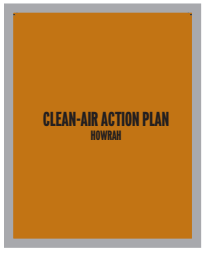
Clean Air Action Plan: Haldia



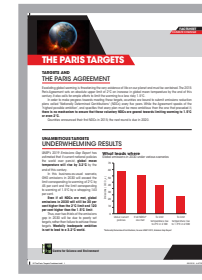
Clean Air Action Plan: Asansol



Clean Air Action Plan: Durgapur

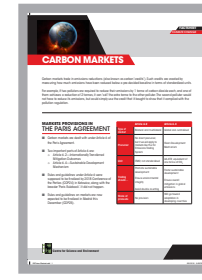


Clean Air Action Plan: Howrah

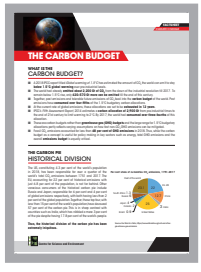


The Paris Targets

The Carbon Budget



Carbon Markets

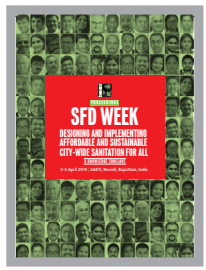


Net Zero

Modern Times, Ancient Excuses

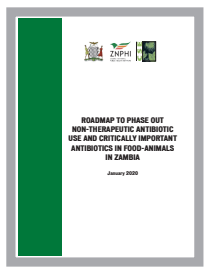
Breathing Space: How to track and report air pollution under the national clean air programme

Let's Clear the Air on Air



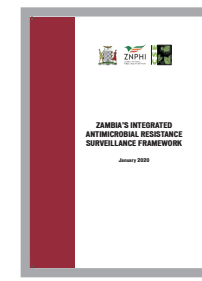
SFD Week Proceedings: Designing and Implementing Affordable and Sustainable City-wide Sanitation for All

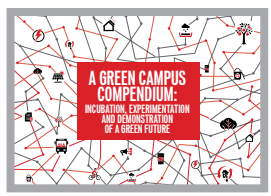
Report: Benefit sharing in the Mining Sector in Africa



Roadmap to phase out non-therapeutic use and critically important antibiotics in Food-Animals in Zambia

Baseline Information for Integrated Antimicrobial Resistance Surveillance in Zambia





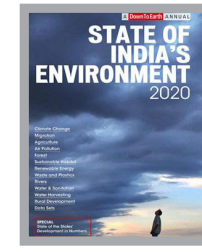
A Green Campus Compendium–Incubation, Experimentation and Demonstration of A Green Future

Green Sense–Residential campus inventory

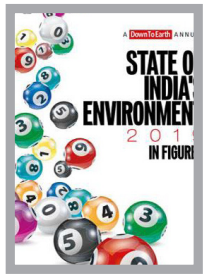
- Stack Monitoring of Brick Kilns: Zigzag Vs FCBTK
- Draft specification of sensor based instruments for measurement of particulate matter in outdoor and indoor environment
- Report: Tracking implementation of new environmental norms by thermal power stations in Maharashtra
- Environmental Impact Assessment Guidelines: Building Construction Sector, Tanzania
- C&D Waste: Dust control
- Mainstreaming Co-treatment of Faecal Sludge and Septage (FSS) in STPS in UP: Co-Treatment of FSS Options at Bharwara STP Lucknow
- Prioritized Activities of Zambia's Multi-sectoral National Action Plan on AMR
- Practitioner's Guide on Decentralized Wastewater Management
- Practitioner's Guide on Lake Management
- Research report: Stormwater Management
- Research report: Water and sanitation: What works and what not
- Tanzania Draft Strategy (pre-meeting)
- Revised Tanzania (with updates to Foreword and acknowledgement)
- Plastics Factsheets Series 1-4
- Environmental Impact Assessment Screening Framework for Namibia (submitted to Ministry of Environment and Tourism, MET)
- Terms of Reference for Mining Projects (draft submitted to the National Environmental Management Council, NEMC)
- Terms of Reference for Industrial Projects (draft submitted to the National Environmental Management Council, NEMC)
- EIA Guidelines for Mining Projects for Ministry of Mines and Energy
- Development of Action Plan for the Polluted River Stretches (Draft)
- Environmental Audit Manual for Ethiopia (Draft)
- Environmental Audit Manual for Ghana (Draft)
- Note: Emission standards
- Using Knowledge, Driving Change
- Anil Agarwal Dialogue: A Diary
- Breathing Space: How to Track and Report Air Pollution under the National Clean Air Programme

Down To Earth Publications

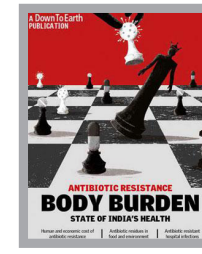
Business of Taste (Food book)



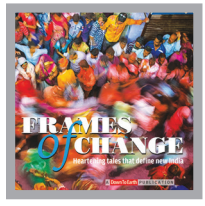
State of India's Environment 2020



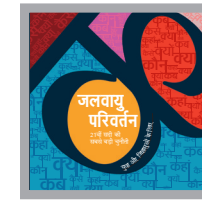
State of India's Environment 2019 in figures



Body Burden: Antibiotic Resistance (State of India's Environment series)



Frames of Change

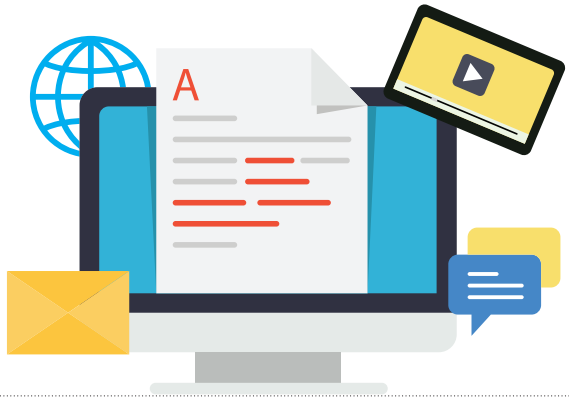


Jal Vayu Parivartan (Science of Climate Change, in Hindi)

India, Global Media Presence (April 2019-March 2020)

Mentions in Print Media

Topic Keywords	Total	India	Global,South Asia & Africa
Air pollution (fuels, mobility, vehicle tech)	468	439	29
Industrial Pollution (Bricks, TPPs, etc.)	17	16	1
Green Rating Project	14	12	2
Agriculture	7	7	0
Climate Change (CoP, Desertification)	62	2	2
Food Safety & Toxins (Antibiotics, junk foods, public health & environment)	111	89	22
Forests	12	11	1
Energy	30	26	4
Environment	31	29	2
Green Buildings/Smart city	22	21	1
State of India's Environmnet (SOE) in figures (2019)	65	60	5
Green Schools Programme	9	9	0
Mining	15	13	2
Wildlife	2	2	0
Water Resource, Water Pollution etc.	49	46	3
Waste Management	43	36	7
Sanitation	16	14	2
Articles by CSE staff (incl. Awards coverage, columns, etc.)	59	56	3
Misc. environment-linked coverage	37	30	7
Total press clippings	**1,091**	**978**	**113**



Mentions in Electronic Media

Air Pollution	112
Water	12
Climate Change	10
Food & Food Safety	17
Flood	04
Agriculture	01
Sanitation & Waste Management	15
Miscellaneous	11
Total electronic media coverage	**182**


DownToEarth
WHY IT IS A PLANETARY EMERGENCY
Fortification: a boon for multinationals
Mismanagement of dams causes floods
DownToEarth
डाउन टू अर्थ
फसल
OUR DISCARDED CLOTH IS A
डाउन टू अर्थ
बोझ
gobar times
Green
special
WORKED FOR THE FARMERS?
gobar times
0%
Emission
GOBAR TIMES
Polluted panchatatva
DownToEarth
IN CONVERSATION WITH PLANTS
ANNIVERSARY SPECIAL
DownToEarth
NEW WORLDS

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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