Centre for Science and Environment

STRATEGIC PLAN 2014-2018

REINVENTING PRACTICE & INFLUENCING POLICIES

for inclusive and sustainable futures

ON THE COVER

The women of Niyamgiri wait to hear the verdict in a landmark event—India's first environmental referendum. Between July 18 and August 19, as the monsoons lashed the country, villages deep inside the forests of south-western Odisha stood witness to the culmination of one of India's most talked about struggles, one among its many million mutinies. Following a Supreme Court direction to the Odisha government to seek consent of villages that were to be impacted by Vedanta's projects in and around the Niyamgiri hills, village council meetings unanimously rejected the projects and put a stop to the industrial giant's ambitions riding roughshod over people's will.

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CSE

Centre for Science and Environment

(CSE) is a public interest research organisation based in New Delhi. It researches into, lobbies for and communicates the urgency of development that is both sustainable and equitable.

We use knowledge to bring about change. In other words, we work India's democracy.

The challenge, we see, is two-pronged. On one hand, millions live within a biomass-based subsistence economy, existing at the margins of survival; the environment is their only natural asset. A degraded environment means increased destitution and poverty. We see enormous opportunities to build a viable local economy dependent on natural resources for livelihood security. This, we believe, will need a commitment to reform—structural reform—in the way we do business with local communities and the environment.

On the other hand, rapid industrial-urban growth is throwing up new problems: growing toxification, costly disease burden and increasing climate change impacts—hitting the poorest and most vulnerable. The answer lies in reinventing the current growth model, which will not cost us the earth. This is the challenge of the balance.

Our aim is to raise these concerns and to participate in seeking answers. And more importantly, we push for the answers to become policy and then practice. We call this knowledge-based activism.

Over the past years, our work has grown, as has the challenge of environmental management. Today, even as many countries of the developing world are struggling to find solutions to immediate problems of poverty, hunger, water scarcity and pollution, the entire world is faced with the catastrophe of climate change. In this age of environment, we see the need to expand our areas of work and most importantly, focus on how we can make change. We believe our work must and can make a difference.

We have worked on our strategic plan for the next five years, knowing fully well that directions or strategy may have to change based on new imperatives. But one thing we know: we are committed to making change on the ground.

We look forward to your feedback; we look forward to our collaboration and partnership to make the difference we all believe in.

CSE

contents

CHAPTER ONE

the challenge

In most parts of the developing world, environment and its degradation remains a big concern. Growing pollution of rivers, cities drowning in garbage, the problem of toxic air and conflicts over resources have become commonplace. Climate change is now threatening lives and livelihoods. The South cannot catch up on the capital and resource-intensive way to growth. We need a complete reinvention of growth, without pollution

In India and most parts of the developing world, environmental degradation remains a runaway problem impinging on public health and exacerbating poverty. Pollution in our rivers is worse today than three decades ago. The garbage in cities is growing by the day, even as governments scramble to find ways of reducing plastic and hiding the rest in landfills in far-off places. Air pollution in cities is worse and toxins damage human bodies, particularly of the poorest. Protection of forests has come at the cost of local economic growth of people who live in and around these areas. The poorest people of India still live in its richest forests. Clearly, this is not the way ahead.

This, in spite of efforts to contain the problem: India, for instance, has invested in building sewage treatment plants to deal with water pollution. It has greatly improved the quality of fuel that runs vehicles, changed emission standards and set up institutions to regulate industrial emissions. But still countries find they cannot catch up in this game of growth and its toxic fallout. This is because countries like India cannot afford to play the game, which is first-pollute and then-clean up. We need a trajectory of growth which leapfrogs us from no-growth-no-pollution to growth-without-pollution.

In the past few decades as India has opened its economy for industrialisation and urbanisation, the struggles for control over resources have intensified. Across India where land is acquired or water sourced or forest destroyed for development projects, a million pollution mutinies are brewing. The fact is in India vast numbers depend on the land, the forests and the water in their vicinity for their livelihood. For them, the environment is not a matter of luxury; it is not about fixing the problems of growth, but of survival. It is fixing growth itself. They know that when the land is mined and trees are cut, their water source dries up or they lose grazing and agricultural land. This is what we call environmentalism of the poor. The fact is today development projects take local resources—minerals, water or land—but cannot provide employment to replace the livelihoods of all those they displace. Therefore, the question is how can development be inclusive and sustainable.

For millions of Indians, environment is a matter of survival, not of luxury

So, where do we go from here? Developing country societies increasingly care about environmental issues. But they are failing to manage the environment. There remain two distinct challenges: First to manage the ecological fallout of economic growth—the pollution and toxification, which comes from generating wealth. Second, to learn how to use the wealth of the natural environment to build economic wellbeing—a truly green economy.

OUR SOCIETAL VALUES

Given the development and environment challenges of the global South, CSE's work will further the following societal values

- Build on the rights perspective to provide communities greater control over natural resources as well as build greater accountability in public regulatory institutions
- Empower the poorest and in particular women in the management of natural resources, including access to energy, water, mobility and also ensuring against exposure of the poorest to toxins and high health burdens
- Deepen democracy —this improves decision making for environmental management
- Eradicate poverty and promote growth that is inclusive, sustainable, promotes climate co-benefit and low carbon development

These are the same choices the environmental movement asked already industrialised countries to make some two generations ago. Today, industrialised country societies are environmentally more responsible and capable; local air and water pollution is under control. But economic growth and rich country lifestyle has pumped huge amounts of greenhouse gases in the atmosphere and has put the entire world at risk because of climate change.

This adds up to a new chapter of environmentalism in the world. Climate change is forcing the world to answer some tough questions on how to be or not to be an environmentalist. We are learning that techno-fix solutions, of cleaning up pollution even as we continue to emit more, are not good enough. Investment in efficiency will not be good enough to solve problems of greenhouse gas emissions. Simultaneously, methods and technologies developed for environmental control in the already industrialised world will also have to be re-engineered to make them affordable and accessible to work in the developing world. Therefore, on the one hand, we need to explore ways to reinvent growth without fossil fuels and on the other hand to grow differently. So, there are limits to growth, unless we can grow differently. ■

We are learning that techno-fix solutions of cleaning up pollution even as we continue to emit more, are not good enough

CHAPTER TWO

our strategy

Today, the idea of environment is accepted. The imperative is uncontested. But practice is poor. In this scenario, CSE will work towards meeting three key challenges: those of driving policy through research and its dissemination; of devising solutions that match the scale of the problems; and of developing capacity of those who can implement solutions and be the change

ANIL AGARWAL
1947-2000

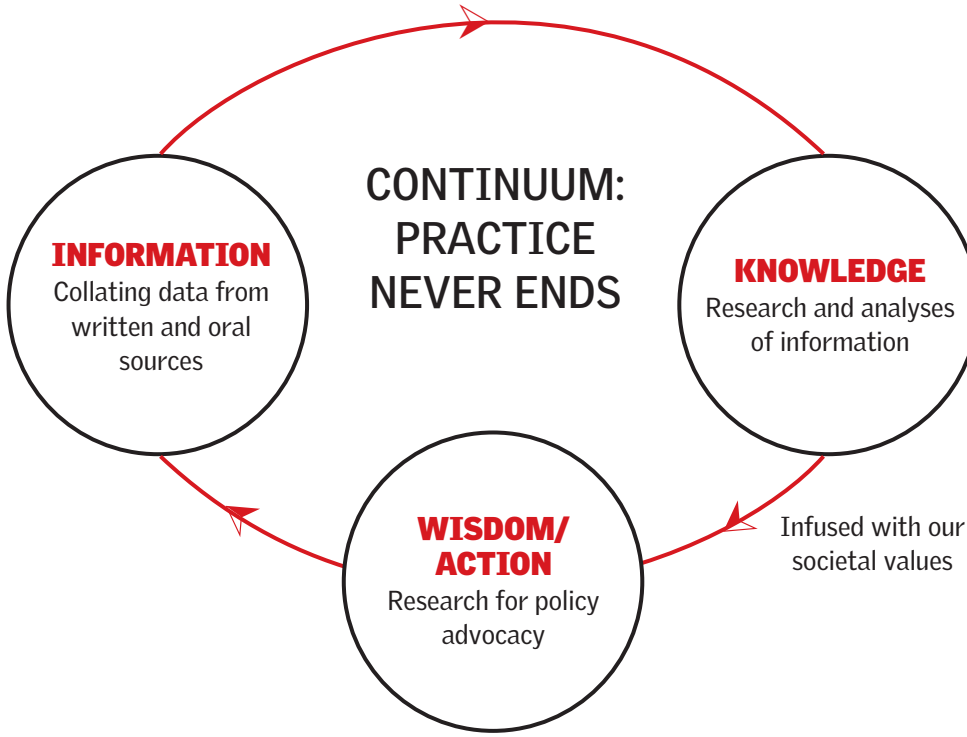
"Conservation and sustainability, as policy goals, must be constituted by the realisation that the State cannot, given its capacities, aspire to be an omnipotent policeman. It must involve the people—especially the most vulnerable; their welfare must be the primary focus of development policies—not as objects but as active agents... The challenge before India is, therefore, to develop a village-centered development strategy through which people can plan their natural resources and have the legal power to implement programmes. The role of government agencies and of voluntary agencies would then be to help people help themselves."

CSE's work has been to use information for driving policy and practice change. This has been a powerful strategy and we will continue to use this in our programmes. CSE practices research-based activism – to use rigorous and value-driven research to advocate policies that work for sustainability and poverty reduction. The key in this work is to disseminate our findings on one hand to build an informed public opinion, using today's powerful digital media (including social media) and on the other hand to influence key decision-makers and change agents. Today, the idea of environment is accepted; indeed the imperative is uncontested; but practice is still poor. This is also because current technologies, methods and measures for environmental protection are capital-intensive and often unaffordable for countries like India and also unsustainable for the Planet. In this, CSE's role is to push the envelope of thinking and practice. Our work programme is adapted to these needs:

- **The challenge of innovative policy:** The need to do research on out-of-the-box solutions and then to cajole and persuade society with this information to agree to big ideas for the transition that it needed.

- **The challenge of scale:** There is an urgent need to implement solutions at the scale of the transition needed. The time for pilot projects or small measures is over. The scale of the challenge is huge. But more importantly the pace of the change is enormous and fast. Society needs to find new solutions, but also find ways of implementing these at a scale, which is meaningful and makes a difference.

- **The challenge of capacity:** If the need is to implement solutions at scale, then the answer is to find multipliers in society who can implement changes; who can think and act differently. ■



CHAPTER THREE

our role

The structure of CSE's programmes reflects our perspectives of our roles in meeting today's challenges. From advocacy to support, and from capacity building to outreach and dissemination, our objective is to drive change. Our obsession is to remain credible, independent and rigorous. In public interest.

The structure of CSE programmes is driven by the overall aim of the organisation to do the following:

- To undertake rigorous (forensic-type) research with underlying principles and societal values so that it can provide answers to societal problems. And to use this research for policy and practice change: **Our thought-leadership and advocacy role.**

- To support environmentalism of poor so that the rights-based movement on environment grows and provides society with the necessary push to look for different answers: **Our support role.**

- To reach out to multipliers, who can help to build a larger circle of influence to drive change in society. To begin with have decided to work with three important groups – media, environmental regulators and public works engineers and schools: **Our capacity building role.**

- To expand work at regional and global levels so that we can influence policy and practice across the world: **Our growth and outreach role.**

- Make research findings accessible and visible through the use of digital and print communication tools that increase engagement and targeted information change: **Our dissemination role.**

To reach out to multipliers who can build a larger circle of influence

CSE PROGRAMMES

RESEARCH AND ADVOCACY	KNOWLEDGE DISSEMINATION	BUILDING CAPACITY/ EDUCATION/ MONITORING
Clean Air and Sustainable Mobility	Down To Earth	Anil Agarwal Environment Training Institute
Green Building	Portal/ Specialised websites	Environment Education
Water-Waste (capacity building, technical support, demonstration projects)	Publications	Media Resource Centre
Water-Waste (research and advocacy)		Pollution Monitoring Lab
Sustainable Industrialisation		
Climate Change		
Renewable Energy		
Food Safety		

Our impacts: in brief

Research and advocacy role

To expand work at regional and global levels to influence policy and practice

The Right to Clean Air campaign (renamed as Clean Air and Sustainable Mobility programme) has achieved remarkable success in pushing for CNG in all public transport in Delhi and more recently, in pushing for better urban mobility options that have made a significant impact on the city's air quality with reduction in carbon emissions from the fleet. **The People's Water Management campaign (now divided into two programmes on water-waste — see table on CSE Programmes)** has mobilised the country through a water literacy campaign calling for decentralised solutions to water harvesting, water pollution, urban sewage management, catalysing policy changes at both national and state levels. In recognition for its efforts, CSE was awarded the Stockholm Water Prize in 2005, the highest international award for water management. **The Sustainable Industrialisation programme** rates industries on energy and environment performance and publicly discloses the information. Using rating as a tool, this programme has achieved remarkable results in improving the environment and energy efficiency performance of Indian industry. A component of the programme provides *pro bono* services to project-affected communities to better engage with the social, legal, regulatory and environmental clearance processes to ensure accountable and transparent industrialisation in their locality. The programme provides project-affected communities with science-based data and evidence on point source pollution caused by industrial projects and their effects on the health of people, land and waterbodies.

The Food Safety programme has created far-reaching changes in the policies and regulations governing the use of toxins such as pesticides and antibiotics. Many of the pollution research and studies are conducted at CSE's **Pollution Monitoring Laboratory** in Delhi, which houses state-of-art equipment.

The **Global Environmental Governance (Climate Change) programme** actively participates in influencing international negotiations on climate change by stressing the need for an urgent agreement that is effective and equitous. An associated activity, the **Programme on Adaptation** has been undertaking studies on policies and real-world options available to India to adapt to changing climate realities. To further the climate mitigation and development agenda, CSE has introduced two new programmes. One on **Green Building,** which aims to do cutting-edge research to make long-term policy interventions important in a rapidly urbanising country. Likewise, the **Renewable Energy programme** conducts research on available renewable energy choices in India, and assesses on-ground implementation of solar, wind and biomass energy to meet the country's national actions plans.

Our capacity building role

Addressing the urgent need to introduce meaningful environmental education at the school level in India, CSE's **Environment Education programme** goes beyond nature education to

get children to evaluate and precisely measure their own environmental footprint using the Green Schools Manual. The Green Schools Network today includes more than 15,000 schools across South Asia, and the manual has been translated into English, Hindi, Kannada, Punjabi, and Arabic. In addition, **Gobar Times,** a monthly magazine for children, keeps students informed and inculcates environmental values. CSE has for long worked closely with journalists, recognising the powerful role the mass media plays in setting public agendas and shaping public opinion. CSE's **Media Resource Centre** has several components, from conducting regular briefing workshops for working journalists and country media briefing workshops in South Asian cities on key environmental challenges, to running a syndicated feature service and a fellowship programme to enable journalists to take time out to study and report on environmental issues.

Read inside: Who owns the sun?

A *Down To Earth* supplement, No.20, September 30, 2001

gobar times

ENVIRONMENT FOR BEGINNERS

THE SURVIVAL GUIDE

COWATS

RED RAIN
Some parts of Kerala received 'red' rains this monsoon. The Centre for Earth Science Studies (CESS) which had initially said that a streaking meteor triggered the rain, took back its statement. It now turns out that it might be fungal spores that made everyone see red in Kerala.

KOLKOTA IS SINKING
Not seen the city yet? Rush, for it might soon disappear. Due to huge reservoirs of groundwater underneath the city being used up, the ground's fast sinking and there is no way to raise it back to its original height, reports someone.

Fundung

WE WANT A CLEAN ENVIRONMENT SAVE US FROM PLASTIC BAGS

WE WANT A CLEAN ENVIRONMENT SAVE US FROM GAS BAGS

ILLUSTRATIONS: RUSTAM VANIA

LAGAAN

Once upon a time in India

Do we pay our ecological *lagaan*?

You have seen the film. You have cheered for my team. We won the match and saved our village from paying the cruel and crippling *lagaan* (tax) to the British for three continuous years. Have things changed much since then? Are the poor and weak still paying *lagaans* or taxes to the rich and powerful? Have you thought about who owes whom today? GT makes a case for a modern day ecological *lagaan* that we all must begin to pay to save our planet.

It is a hot, hot summer day. It is over 12 hours that you had food and you are very hungry, but it is your kid sister that you are more worried about. Despite the damp heat, you finally manage to fall asleep. Knock! Knock! The British officer cometh. 'TOOMNAY APNA LAGAAN DIYA NAHIN (You haven't paid your taxes)', He shouts.

You know very well what *lagaan* or tax means — slave the year long at the dry, unyeilding fields and give away precious grain without keeping enough for yourself. You get up with a start, sweating. Thank god, it was a dream! No British officer in sight, just your mother who is calculating how much income tax she has to pay, mumbling all the while about the pain she takes throughout the year to earn money just to give away huge sums at the end of the year to the government. 'It's our water but I have to pay for using it', she says, looking at the water bill. Through your window, you see the dark smoke spiralling out of the factory chimney across the river. 'Mom, does the factory pay for poisoning our air?' you yell. Your mother just glares back.

Throughout history, *lagaan* or tax has always been taken from every person who earns, uses, buys or owns property and services. Names vary — land tax, forest tax, income tax, property tax, sales tax, road tax. Have you ever wondered who takes tax, and why is it taken? Just like your parents need to earn money to feed, clothe and provide shelter to you and themselves, so does a government need money to manage the country. In fact no *lagaan*,would mean no governments!

The history of human civilization has been the history of evolving systems of *lagaan* by the rich from the poor, the landlord from the peasants, the colonialists from the natives, the ruling class from the working class, governments from citizens. A history of conflict over resources, especially natural resources.

The earth's land and water and its living resources was all that our ancestors had to survive on. Hungry? Just clamber up a fruit tree, or collect delicious berries and nuts from wild plants. What about honey from a beehive? Yummy! Or if you were a crack shot you could hunt animals in the jungle for their meat. Catch fish? If you were smart enough and knew how, you could grow crops and eat them. You could possibly also keep cattle and drink their milk and eat their meat.

'How nice!' you might exclaim. A few amongst our ancients, the more clever, shrewd and stronger ones, had other ideas. You scrap your knees when you climb trees, bees sting you when you collect honey, and ploughing a field in this heat? No way! Why bother with all this running around to survive. Just force the majority to pay a land tax or *lagaan*. In return we will provide you 'protection', they proclaimed. Thus the ruling class and their controlling armies were born. At the same time, this ecological heritage of forests, rivers, and the fruits and animals in them, still the basis of all the wealth in the world, ceased to belong to 'everyone'.

Various *lagaans* were created by rulers to tax landlords, who in turn took the extra produce that peasants grew on their land. In exchange they provided protection and patronage. Just like our modern day governments.

Today much of the world has 'progressed' to an industrialised one, colonised nations are free and independent. But the *lagaans* remain. The weak and the powerful sides remain. Unlike in Amir Khan's film however, we cannot settle the matter through a cricket match in real life!

A *lagaan* is a way to assert rights over the use of resources

GT

Gobar Times, a monthly magazine for children, is one of CSE's key information vehicles, targeted at young readers and students, with the aim of keeping them informed and inculcating environmental values. GT was born as a wall magazine (one of the older issues is seen here)

In the past five years, CSE has expanded its work to the regional level, with substantial success

Our growth and outreach role

In the past five years, CSE has expanded its work to the **regional** level, with substantial success. All programme units working at the national level have built new partnerships so that the circle of influence can grow. We now expect to do the same at the global level.

Our dissemination role

CSE has built a powerful medium through its fortnightly magazine and website, **Down To Earth,** for disseminating information. In addition, it has specialised websites for outreach and uses tools of social media for engagement. In this year, we have had over three million visitors and 6.5 million page views on our sites. In addition, we have a fortnightly newsletter of our activities, which reach 0.5 million people and provides a powerful way of dissemination. ■

CHAPTER FOUR

our partnerships

CSE has instituted close collaborations with a diverse set of government and civil society actors across a host of fields in India and abroad. We believe that without these partnerships, we cannot extend our circle of influence

As an environmental policy and advocacy think tank with a legacy of more than three decades of research, communication, networking and activism in public interest, CSE has built a strong and diverse constituency and a deep engagement with a varied set of actors and issues, both in India and abroad.

Today, CSE works in close collaboration with a variety of government and civil society groups across a host of fields in India and abroad. Individual CSE staff members are also part of important policy and rule-making committees in India and internationally, while the Centre provides a number of platforms for collaborative research and action.

We believe that without these partnerships, we cannot extend our circle of influence; we cannot reach out to multipliers who will then drive change in society. We also believe that it is critical to reach out and build capacity of the current generation of regulators and municipal and environmental officials so that we can scale up the practice of change that we need.

Our partnerships extend across disciplines. For instance, we partner with India's premier science and technology institutions to co-host the Indian Climate Research Network: these institutions include the Indian Institute of Technology (IIT)-Delhi; IIT-Madras; and the Indian Institute of Science-Bangalore (IISC). This is because we have clearly identified the need to build a network of scientists from the developing world, who will work on critical issues of climate impact, mitigation and adaptation.

Formal partnerships in India include a collaboration with the Ministry of Environment and Forests (MoEF) and the Central Pollution Control Board (CPCB) to help strengthen the capacities of central and state-level pollution control boards (PCBs) in the country. As part of this, a series of training and capacity-enhancement programmes are held, including a month-long induction course for all PCB officers with less than five years of on-job experience, as well as a series of advanced trainings to familiarise senior and middle-level pollution regulators with emerging pollution sources, and their abatement or control technologies. More than 360 pollution control regulators were trained from 2010 to 2013.

Exposing environmental regulators from South Asia to global best practices

In order to do this, CSE has signed an MoU with the Swedish Environmental Protection Agency (Sw-EPA). Under this, CSE leads a team of Indian pollution control officials to Sweden to explore cutting-edge technologies, tools and approaches of monitoring, enforcement and compliance of industries, based on both Swedish and EU protocols. Talks are on with the environment pollution regulator of Norway to broad-base this cooperation.

Governance for sustainable future: our work to strengthen capacity of public institutions and decision-makers

- Tripartite partnership between the Ministry of Environment of Forests (MoEF), the Central Pollution Control Board (CPCB), and CSE to train environment and pollution regulators.

- Partnership with the Gujarat State Pollution Control Board on training state-employed regulators on industrial monitoring and compliance mechanisms, and on hospital and biomedical waste management. The cooperation also covers training private sector industry professionals, and includes joint research.

- Structured capacity development agreements with the Bihar State Pollution Control Board, which is supported by the World Bank and covers training and technical backstopping to state-level pollution regulators. CSE has an agreement with the German development agency GIZ to support regulator trainings on e-waste and hazardous waste management.

- Designated a Centre of Excellence in sustainable water and waste management by the Ministry of Urban Development to train municipal functionaries and city authorities on rainwater harvesting and decentralised waste management.

- Designated a National Key Resource Centre in the area of sustainable water management and sanitation by the Ministry of Drinking Water and Sanitation. As part of this scheme, CSE helps build capacities of public health engineering department staff (responsible for planning and implementing water schemes in rural India) on sustainable drinking water management and rural sanitation.

- Nominated to the Bureau of Indian Standards (BIS) committee for developing standards for household water treatment systems.

- Over the past three decades, CSE has also collaborated directly with city governments in India on sustainable urban water and waste management: Chandigarh, Shimla and NOIDA are some of the examples.

- CSE has an agreement with the Ministry of External Affairs to train Indian Foreign Service (IFS) probationers on climate change science, politics, policies and practices. These are highly interactive courses and include simulation exercises to familiarise IFS personnel about international climate and other global environmental negotiations.

- CSE's Green Building programme works with the Central Public Works Department to help guide and train the government's main construction agency on green building technologies, approaches and practices.

More recently, CSE has entered into partnerships to leverage specialised expertise. For instance, it recently collaborated with the German development agency, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), to help acquaint state pollution regulators with the know-how and best practices involved in the management and handling of e-waste. Although the E-waste Rules in India came into force in May 2012, many states have not yet developed any framework to manage this waste generated in their cities. ■

CHAPTER FIVE

why global?

Global cooperation requires participation and engagement from the South. The approaches and solutions emerging from the countries of the South will sharpen global action. CSE, with its long track record in leading the development and environment discourse, is equipped to play that role. We believe the global agenda requires learnings from local action and in turn, the local action needs global support. It is a global-local world.

In India, CSE has already grown and matured in stages:

- **Stage I:** As an awareness raising body on Southern imperatives of the environment and development discourse
- **Stage II:** Playing an advocacy role to influence policies for sustainability
- **Stage III:** Playing a mentoring role for regulatory and societal actors for capacity building to support new generation policy-making and implementation
- **Stage IV:** Developing the ability to provide technical research support to bring hard scientific evidences to enable decision-making and support community action
- **Stage V:** Participating and engaging with global processes to integrate regional issues and solutions with the global framework

This multi-layered role has given enormous levers to CSE to directly participate in rule-making processes of the national and state governments in India as well as regional governments in South Asia, where CSE began working in late 2000. Our regional role is located in the regional demand to understand, share and address common and unique challenges for customised solutions in South Asia. There is strong demand for intra-regional flow of information and knowledge and inter-linking of global knowledge and experience.

CSE's engagement in South Asia has taken the form of:

- **Formal partnerships:** with various government ministries for capacity building and rule-making (EIAs, pollution regulation etc)
- **Awareness raising action** with civil society, news media and educational institutions (network action)
- **Transfer of technical knowledge** for implementation (water harvesting, waste management, air quality management, etc)

OUR regional role is located in the region's demand to understand, share and address common and unique challenges for customised solutions in South Asia

The broadening of CSE's ambit of work and influence is also driven by the demand from the state and non-state actors in the South Asian region. CSE is already integrating and disseminating the learning from different countries in South Asia.

Our partnerships and impacts in the South Asian region

CSE's presence in the South Asian region has matured because of its focused programme in the region. This is evident from the geographical spread of activities and the variety of its engagements with many kinds of stakeholders.

Today, CSE teams have forged collaboration agreements with more than 25 government, NGO and academic partners in Bangladesh, Nepal, Sri Lanka and Bhutan. The range of regional interventions is diverse—from capacity building to in-depth reportage, and information dissemination to direct policy-level interventions to guiding the implementation of sustainable infrastructure. Much of the work in the region is in response to demand from civil society actors, regulators and government agencies.

CSE teams have forged collaboration agreements with more than 25 government, NGO and academic partners in three countries

In **Bangladesh,** CSE has worked closely with the Department of Environment (DoE) since 2008. CSE prepared detailed technical EIA guidelines on leading industrial sectors, including coal mining, cement, pharmaceuticals, pulp and paper and coal-based thermal power plants, and conducted a series of trainings for DOE regulators. As part of its technical cooperation on urban water policies and practices with Water Aid, Bangladesh (WAB), CSE has trained more than 190 stakeholders, including architects, consultants, NGOs, academicians, and regulators in Bangladesh, and commissioned seven model projects on decentralised water and wastewater treatment in partnership with local NGOs.

In **Sri Lanka,** CSE provides technical and capacity support to the Central Environment Authority (CEA). Besides training key environmental regulators, CSE has prepared guidelines and standard operating procedures for inspection, monitoring and compliance assurance that will enable regulators to better evaluate development and infrastructure projects in the country. CSE has also entered into a tripartite agreement with the Ministry of Water Supply and Drainage and the Lanka Rain Water Harvesting Forum (a leading NGO on water), on building capacities and providing technical support to demonstration projects on rainwater harvesting and decentralised wastewater treatment. More recently, CSE's wide-ranging cooperation with the Geological Survey of Mines Bureau (GSMB) includes joint research, training and capacity development of GSMB officers.

In **Bhutan,** CSE provides wide ranging technical support to the country's environment regulator, the National Environment Commission (NEC), to manage, oversee and regulate the massive industrial and urban transformation the country is undergoing. This wide-ranging cooperation includes capacity building (more than 150 government officials from Bhutan have undergone CSE training), and exposure of NEC regulators to emerging technologies and approaches to pollution monitoring and compliance assurance (EIA). CSE has prepared the Environment Assessment (EA) guidelines of eight sectors for Bhutan—industry, forest, roads and highways, hydropower, mining, tourism, transmission lines and 'general' sector(s). Subsequent consultations were conducted to disseminate the guidelines to relevant NEC staff, and to line managers drawn from 23 key ministries and departments of the Royal Government of Bhutan. In response to a specific request, CSE has also developed an

action plan for clean air and sustainable transportation for the city of Thimphu, with focus on a time-bound plan to curb vehicular pollution and achieve sustainable mobility. CSE has also prepared guidelines for vehicle washing facilities, and conducted an inspection of the Pasakha industrial estate, near Phuentsholing at the India-Bhutan border.

The imperative to influence policy and action globally

The global framework for addressing sustainable development and climate change is transforming rapidly in response to emerging science as well as the evolving trajectory of national policy action in different regions of the world. All streams of concerns—health, climate change, energy security and local imperatives of sustainable development are converging. This requires a co-benefit framework for mitigation.

Global community (policy makers and negotiators, civil society, and industry from different regions) will have to reinvent the framework of global and regional cooperation to find locally and globally appropriate solutions within the co-benefit framework. This demands new methodologies for assessment and action and very strong interlinking of local and global initiatives and imperatives.

CSE with strong local roots and deep regional experience can play a crucial role in this interlinking of local and global action, especially in the developing world, and carry that forward to the global level.

We therefore, believe the challenge is to globalise cooperation and localise action. CSE's work at the South Asia regional level has given us opportunity and experience to see how effectively we can intervene. In the past three-four years, we have expanded the ambit of our research to cover different countries. This brought new ideas to the table and we used this to influence policy-making in India and other countries. For instance, in Bangladesh, we worked on a lake protection law and introduced rainwater harvesting training curriculum; recognising weak public governance practices we collaborated on training regulators from Bangladesh, Bhutan and Sri Lanka; we have also catalysed public opinion by working to brief media on the key aspects of the environment and development challenge.

With strong local roots and deep regional experience, CSE can play a crucial role in this interlinking of local and global action especially in the developing world and carry that forward to the global level

We believe, therefore, that CSE's work has relevance and resonance at the global level. There are two ways in which we currently play a role at this level:

- **As a thought-leader:** The ideas advocated for India have been widely disseminated and used across the world—from rainwater harvesting to workable options for mobility transition. These solutions are based on hard, and often complex, ground realities and therefore, look for different options for managing the balance of growth and environment.

- **As a partner in global processes:** We have a track record in participating in climate, biodiversity and toxin-related negotiations and agreements. Our research and interventions have influenced thinking and government positions. Staff members of CSE have played roles in many different global forums: for instance, as a member of the Swedish government's high level panel on climate change and development; as first co-chair of the GRI technical advisory committee; and as co-chair of the Clean Air Initiative for Asian Cities.

CSE particularly is in a unique position in the Southern world to understand, engage and convey the issues of the trajectory of growth of developing countries

What we propose to do?

- **Build knowledge through research on common global issues:** The key is that this global research will prioritise and emphasise the need for knowledge to be used to influence global and national policy:
  - Sustainable urbanisation—with particular focus on solutions that are equitable, transitional, and sustainable.
  - Ensure clean water access and advocate affordable sanitation solutions that do not add to the burden of pollution and health.
  - Find answers for energy access for the poorest, including devising national and global strategies for transition to clean and low-carbon energy.
  - Sustainable industrialisation by finding pathways of growth where incremental steps are avoided in chemical use and toxins.
- Disseminate findings of research through online and offline publications; workshops and press-briefings. Our existing outreach is powerful and global. We will build on this.
- Provide technical support for implementation in key focal areas (decentralised water and sewage).

- **Work with specific multiplier groups in the countries:**
  - To build a global network of environmental regulators, with capacity building to improve understanding of challenges and tools to make the difference. Our work in South Asia has shown us that the most effective work is demand-driven. In the region (as in India), we work directly with government agencies to support institutional and regulatory capacity building as the centre of excellence in new and appropriate technologies. We would like to expand this to other regions of the world.
  - Work with schools and colleges to implement green solutions (Green School/Environment Education programme) and also to introduce curriculum to impart learning on solutions.
  - Work with media to build public support and deepen engagement on specific issues and challenges. We would leverage the convening ability of CSE to reach out to different groups in society to build common understanding of the ways ahead and to take action.

- Work to build a critical dialogue on key global issues—climate change, biodiversity, toxins—to influence global negotiations. On one hand, global agreements require greater understanding of the positions and perspectives of developing countries. On the other, there must be a greater understanding of the global negotiations within developing countries. Our work will be to further this, by interventions at the global level and by influencing public policy at the national level.

Why global cooperation needs voices from South?

We believe global cooperation requires participation and engagement from the South. CSE particularly is in a unique position in the Southern world to understand, engage and convey the issues of the trajectory of growth of developing countries, which is different from that of the industrialised and capture the elements of learning for `reinvention of growth without pollution` to structure engagement with the global processes. This is a unique yet complementary role.

We believe global environmental cooperation cannot do without participation and engagement from the South. The approaches and solutions emerging from the countries of the South will sharpen global action. Similarly, global initiative can become effective only if unique challenges and potential of each region and the emerging solutions in different regions are well integrated to enrich and enable meaningful action, which we aspire to achieve. CSE, with its long track record in leading the development and environment discourse is well placed to be a global think tank with roots in the South to catalyse action locally and globally.

CSE's awareness action is geared towards building larger societal support for policy, practices and implementation in regions. Lack of public understanding and support is one of the biggest barriers to implementing solutions in all regions of the world.

CSE can effectively leverage its ongoing work on capacity building, particularly of public institutions and regulatory systems, to help both state and non-state actors to better scrutinise, mediate and balance sustainable development options.

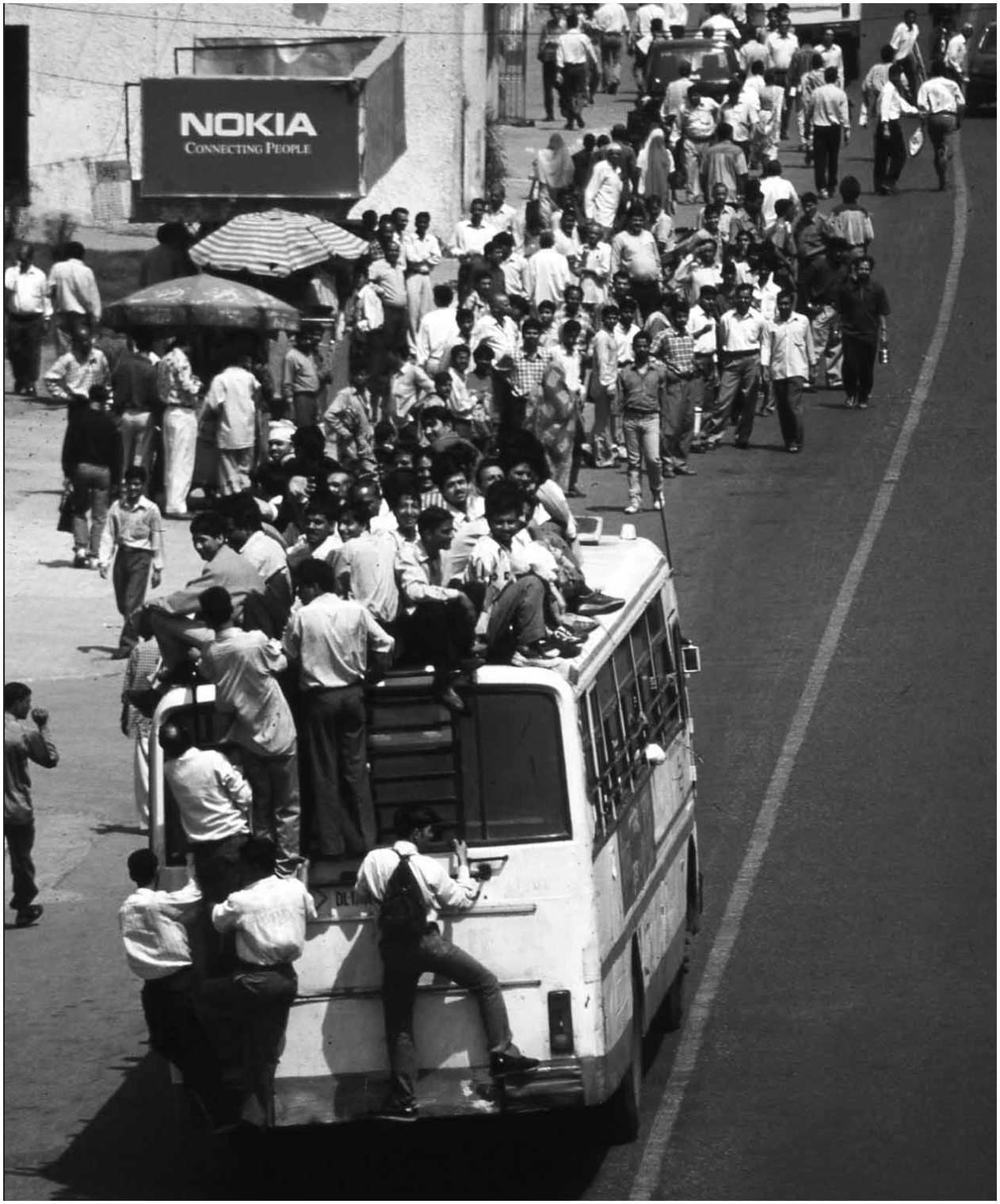
CSE's engagement with other global networks will help support initiatives in different regional hubs. It will enable better participation in global agreements and sharpen the need for appropriate development and environment action for a just and sustainable world. ■

CHAPTER SIX

our programmes

- Clean Air and Sustainable Mobility • Green Building
- Water-Waste • Sustainable Industrialisation
- Climate Change • Renewable Energy • Food Safety

Clean Air and Sustainable Mobility



The imperatives and proposed role

Vehicular air pollution in urban India has been one of our key areas of work. CSE's Clean Air and Sustainable Mobility programme had originated in the realisation that there was a crisis brewing on urban air quality and public health in Indian cities due to rapid motorisation. Over 50 per cent of cities have particulate pollution level that is officially classified as critical. This has compounded the problem of energy insecurity and climate impact. The transport sector uses up more than 40 per cent of the petroleum products. Massive use of diesel in vehicles is further aggravating the local toxic risk as well as climate risk because of high black carbon emissions (*see box on black carbon*).

1996

CSE releases ***Slow Murder.*** Arms people with information

Motorisation and dieselisation are happening based on outdated vehicle technologies and fuel quality—seven to 12 years behind Europe. On the other hand, the daily travel length and duration is increasing rapidly in cities with growing dependence on personal vehicles, traffic congestion because of increasing numbers of vehicles, and sprawl-based urban design.

Indian cities cannot fight this battle of dirty air, car bulge and fuel guzzling alone. Small steps are being taken across cities, but these are too little and too late—they need to gather pace backed by good science, technical and regulatory capacity, and an aware and involved public.

Between 1996 and 2014, CSE worked concertedly to introduce clean fuel (compressed natural gas or CNG) and pushed public transport as the option for breaking the mobility gridlock in cities. One of the most significant success stories that emerged out of these efforts was the transformation of the travel mode in Delhi, the nation's capital: the city now has the biggest CNG-run public transport system in the world.

However, it is time to move on, literally—and CSE is looking towards expanding the scope of this programme to a global scale based on co-benefit principles of public health, climate change and energy security. By 2030, CSE aims to propel the key regions in the Southern world towards meeting the World Health Organization (WHO) guidelines for ambient air quality. While about 25 per cent worldwide CO_2 emissions are attributed to transport, nearly one-fifth of global black carbon emissions come from the transportation sector, with a relatively large share coming from diesel vehicles. Worldwide, as per the 2010 Global Burden of Disease assessment, outdoor air

Black carbon

Black carbon is a component of soot, released during combustion, particularly incomplete combustion of fossil fuels or biomass. The main sources of black carbon emissions are burning of biomass in inefficient cooking stoves, diesel emissions from the transport sector and from generators (especially those without pollution filters), and burning of other fossil fuels and biomass in industry and power production.

Black carbon consists of ultrafine particles or PM0.1, and poses a strong health risk. It also strongly absorbs light and converts that energy to heat. The effect that worries scientists the most is, when black carbon is deposited on snow or ice, it darkens the snow/ice, increasing their absorption of sunlight and making them melt more rapidly. However, because of its brief atmospheric lifetime measured, black carbon's climate effects are strongly regional. Black carbon's short lifetime also means that its contribution to climate warming would dissipate quickly if emissions were reduced.

1996-97

CSE's ***Right to Clean Air*** campaign kicks off with communication tools such as this poster

pollution contributes annually to over 3.2 million premature deaths and over 74 million years of healthy life lost.

Evidently, clean air action in the Southern regions would require significant reduction in vehicular emissions through technology improvement as well as mobility management. This programme is expected to catalyse change in the targeted countries; these countries are currently working with differentiated targets based on their unique imperatives to set emissions standards roadmaps to get clean vehicles and fuels. One of the key clean air strategies will be to eliminate dirty diesel from the region to provide climate co-benefit.

By 2030, the targeted regions should also reduce vehicle miles travelled and achieve an 80 per cent public transport ridership with scaled up walking and cycling, and accessible and compact city designs to reduce travel distances. This will contribute to the new global transport agenda of doubling the share of public transport, walking and cycling by 2030 *(see box: Claim the road...)*.

India needs to tap into the emerging best practices in the Southern world as well as in developed countries to understand the principles for good regulatory practices, planning and public awareness to accelerate action locally. At the same time, India can share its own learning with these nations. On a global scale, reducing emissions from long-range transportation systems—such as railways, aviation and marine—will also require more effective and guided participation of the southern world. The Southern world needs to engage effectively to ensure a fair deal in which even as emissions targets are improved, unilateral market restrictions are avoided and Southern countries with growing aviation industries and a large marine presence can refine their national strategies to address this emerging challenge.

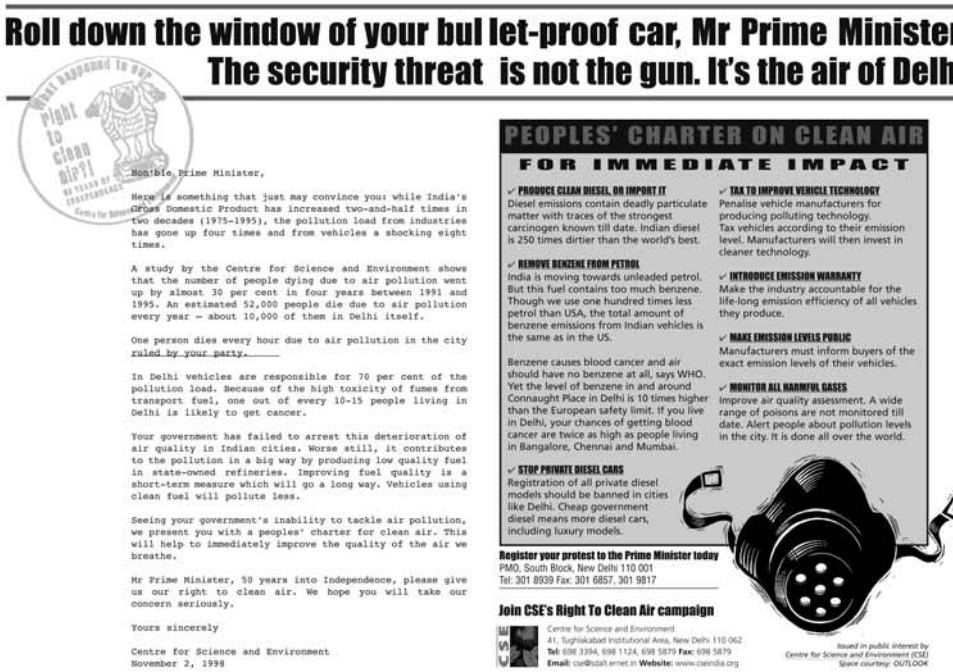
Claim the road...

Every year, hundreds of people die by doing nothing more than the most ordinary thing like crossing a road. This is what happens in every city of our country, on every road, as we plan without care for the safety of pedestrians and cyclists. There are no dedicated lanes for cycles and sidewalks for walkers; roads are for cars (see graph – on accidents).

But cycling and walking are difficult not just because of poor planning. It is also because of our mindset that only those who move in a car have a status and road rights. Anyone who walks orcycles is considered to be poor, and destined to be marginalised, if not obliterated.

This is what must change. We have no option but to reinvent mobility. If we are serious about combating air pollution then we have no option but to think of restraining the growth of cars. Learn how to move people, not cars. Today, there is talk of transport, even cycling and the needs of pedestrians. This is exactly the need of the hour; reduce lanes for cars and add space for buses, cycles and pedestrians.

Excerpted from an editorial written by Sunita Narain for Down To Earth.



Roll down the window of your bul let-proof car, Mr Prime Minister. The security threat is not the gun. It's the air of Delhi

Right to clean air?!

Hon'ble Prime Minister,

Here is something that just may convince you: while India's Gross Domestic Product has increased two-and-half times in two decades (1975-1995), the pollution load from industries has gone up four times and from vehicles a shocking eight times.

A study by the Centre for Science and Environment shows that the number of people dying due to air pollution went up by almost 30 per cent in four years between 1991 and 1995. An estimated 52,000 people die due to air pollution every year – about 10,000 of them in Delhi itself.

One person dies every hour due to air pollution in the city ruled by your party.

In Delhi vehicles are responsible for 70 per cent of the pollution load. Because of the high toxicity of fumes from transport fuel, one out of every 10-15 people living in Delhi is likely to get cancer.

Your government has failed to arrest this deterioration of air quality in Indian cities. Worse still, it contributes to the pollution in a big way by producing low quality fuel in state-owned refineries. Improving fuel quality is a short-term measure which will go a long way. Vehicles using clean fuel will pollute less.

Seeing your government's inability to tackle air pollution, we present you with a peoples' charter for clean air. This will help to immediately improve the quality of the air we breathe.

Mr Prime Minister, 50 years into Independence, please give us our right to clean air. We hope you will take our concern seriously.

Yours sincerely

Centre for Science and Environment
November 2, 1998

PEOPLES' CHARTER ON CLEAN AIR

FOR IMMEDIATE IMPACT

✔ **PRODUCE CLEAN DIESEL, OR IMPORT IT**
Diesel emissions contain deadly particulate matter with traces of the strongest carcinogen known till date. Indian diesel is 250 times dirtier than the world's best.

✔ **REMOVE BENZENE FROM PETROL**
India is moving towards unleaded petrol. But this fuel contains too much benzene. Though we use one hundred times less petrol than USA, the total amount of benzene emissions from Indian vehicles is the same as in the US.

Benzene causes blood cancer and air should have no benzene at all, says WHO. Yet the level of benzene in and around Connaught Place in Delhi is 10 times higher than the European safety limit. If you live in Delhi, your chances of getting blood cancer are twice as high as people living in Bangalore, Chennai and Mumbai.

✔ **STOP PRIVATE DIESEL CARS**
Registration of all private diesel models should be banned in cities like Delhi. Cheap government diesel means more diesel cars, including luxury models.

✔ **TAX TO IMPROVE VEHICLE TECHNOLOGY**
Penalise vehicle manufacturers for producing polluting technology. Tax vehicles according to their emission level. Manufacturers will then invest in cleaner technology.

✔ **INTRODUCE EMISSION WARRANTY**
Make the industry accountable for the life-long emission efficiency of all vehicles they produce.

✔ **MAKE EMISSION LEVELS PUBLIC**
Manufacturers must inform buyers of the exact emission levels of their vehicles.

✔ **MONITOR ALL HARMFUL GASES**
Improve air quality assessment. A wide range of poisons are not monitored till date. Alert people about pollution levels in the city. It is done all over the world.

Register your protest to the Prime Minister today
PMO, South Block, New Delhi 110 001
Tel: 301 8939 Fax: 301 6857, 301 9817

Join CSE's Right To Clean Air campaign

Centre for Science and Environment
41, Tughlakabad Institutional Area, New Delhi 110 062
Tel: 698 3394, 698 1124, 698 5879 **Fax:** 698 5879
Email: cse@sdalt.ernet.in **Website:** www.cseindia.org

Issued in public interest by Centre for Science and Environment (CSE)
Space courtesy: OUTLOOK

Open letter

To the then prime minister, Atal Bihari Vajpayee. This advertisement listed the actions needed and gave people the chance to protest: by providing the home phone and fax number of the prime minister!

The strategy for implementation

Our programme will have the following initiatives:

Initiative 1: Clean air and clean diesel

The focus of this initiative would be to build public awareness and deepen policy understanding to drive targeted countries towards clean air actions with special focus on vehicular emissions. It will aim at pushing governments or regulatory agencies to adopt a time-bound plan for clean air actions, including creating a roadmap on emissions standards, and instituting anti-diesel and/or fiscal measures in the target countries. For instance, it will work to push countries that are on the way to meeting Euro IV standards to set stiffer targets, including moving to Euro VI emissions standards within five years, introduce clean diesel (10 ppm sulphur), and initiate strategies to reduce diesel toxicity and black carbon.

The initiative would also concentrate on sharing CSE's learning and expertise in regional and global policy discussions, building capacity of all stakeholders including regulators, and strengthening networks to organise outreach to enable local and global action.

Initiative 2: 'Bus, walk and cycle' for safe and accessible cities

This campaign will work with select 'champion cities' from Asia and Africa to create safe and sustainable mobility plans by preserving their commuting practices dominated by walk, cycle and public transport. The aim would be to achieve 60-80 per cent modal share for public transport and non-motorised transport by 2030. Measures will include advocating accessible and equitable city design, together with demand management measures, including road pricing and parking. CSE will engage with global processes, such as policy deliberations on post-2015

2000-03

Down To Earth

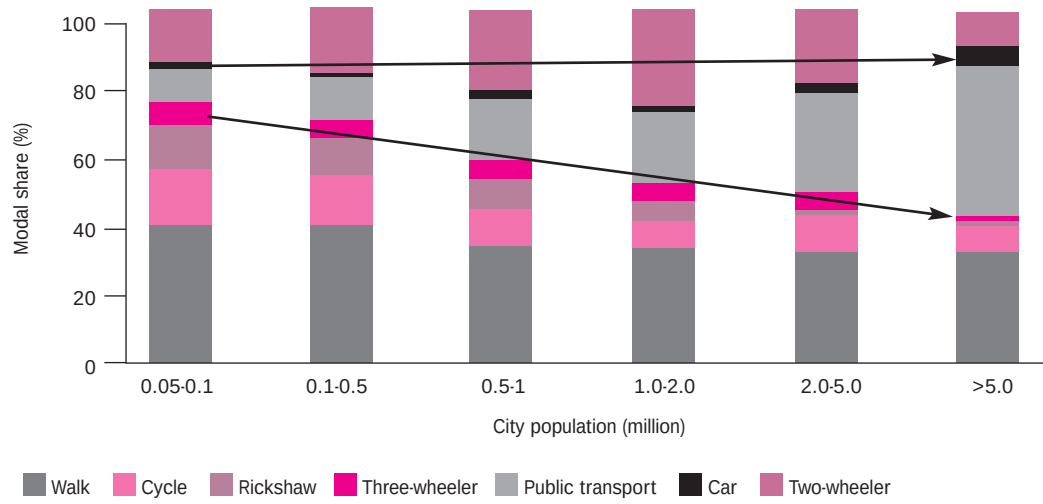
SAROTHARS

THE MEN WHO DERAILED THE SUPREME COURT CNG ORDER

Poachers run riot in Corbett Tiger Reserve
How do your genes react to toxic chemicals?
The map of the human genome is ready

The fight for CNG begins, and is won. Other issues that get covered include bus safety and an Auto Fuel Policy

How people travel in Indian cities: we walk, cycle and bus because we are poor. We must walk, cycle and bus because and when we are rich



Source: Transportation Research and Injury Prevention Programme (TRIPP), IIT, Delhi

Development Framework of UNGA (to double public transport ridership globally) and with the Rio Plus document of 2012 (which identifies sustainable transportation as one of 26 cross-cutting thematic areas for climate mitigation).

As in the case of the first initiative, this campaign will also include efforts towards sharing of learning, capacity building and strengthening of networks.

CSE will continue to push (hard and aggressively) for public transport transition in Indian cities. The government of India's urban financing programme (JNNURM) provides for mobility plans to be developed in all cities and also for a reform agenda, which would allow for large scale transition as well as car restraint measures. We will cajole action on this front so that we can deal with the double challenge of air pollution, health and mobility. CSE believes strongly that countries like India have the opportunity to leapfrog: we walk, cycle and bus today because we are poor, we must do this because and when we are rich *(see graph)*.

Initiative 3: Reduce emissions from long-range transportation systems (marine and aviation)

CSE will influence global decisions on emissions standards and mitigation strategies for the marine and aviation sectors that are being addressed in global forums such as the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO).

Under the UNFCCC, there is a worldwide effort towards integration of sustainable transportation in the global framework to influence issues related to transfer of knowledge, finance, and technology in the transportation sector. CSE will engage with this process—and similar other processes—more strategically. The Centre will also participate in global partnership forums to

maximise its outreach on targets, principles and goals for the sustainable mobility programme.

In addition to policy research and advocacy, each of these campaigns will require customised communication and outreach for stakeholders in the targeted regions, building capacities of regulators and changemakers, together with sustained media engagement. CSE will do all this by initiating and nurturing partnerships and alliances with formal as well as informal networks.

Naturally, global expansion will be strongly rooted in CSE's participation in policy-making and awareness creation in India. CSE is already deeply grounded in decision making processes through its formal participation in the official committees and authorities at the city and national levels. Among these key regulatory platforms are the National Panel on Climate Action Plan that is expected to drive climate mitigation in India; the Environment Pollution (Prevention and Control) Authority set up under the direction of the Supreme Court to monitor clean air action plan in eight cities of India; and the Committee on Habitat Standards under the Habitat Missions of the Ministry of Urban Development. This presence will be further leveraged to build dialogue across regions. ■

The key outcomes

- National/city governments or regulatory agencies commit to adopt a time-bound plan for clean air actions, including creating a roadmap on emissions standards, and instituting anti-diesel and/or fiscal measures in target countries by 2020.
- Clean air and health benefits in Indian cities because of improved fuel/vehicle technology and mobility transition.
- Targeted countries and cities in Asia and Africa to create safe and sustainable mobility plans—to achieve 60-80 per cent modal share for public transport and for NMT (walk and cycle).
- CSE and network partners are able to put forward Southern priorities advocating for tighter targets, climate and mobility co-benefits (transfer of knowledge, finance and technology) and a strengthened global and regional agenda on sustainable long range transportation and emissions mitigation strategies.

Green Building

The imperatives and proposed role

There is no doubt that greener buildings are key to sustainable development—buildings contribute to resource extraction for building, energy and water use and discharge of effluents. Therefore, ensuring that existing buildings are retrofitted for resource efficiency and that future buildings substantially reduce their resource footprint is critical. Countries like India can get it right today as over 80 per cent of the building stock will only now be built. But they can also get it horribly wrong if they do not have the right regulations for stipulating and measuring the green performance of buildings.

A few years ago, we asked why CSE should work in this area, which is dominated by large numbers of certification agencies and consultants. We found that there were no institutions working in the public policy space, which would critique developments and push for reforms. So, while there is a buzz about 'green buildings', there is still little understanding of what we mean by green buildings that are both sustainable and affordable. CSE believes that green is not about first building structures, which use lots of materials and energy, and then fixing it so that it becomes a little more efficient. Building green is about buildings, which optimise on the local ecology, use local materials as far as possible and most importantly, build to cut the power, water and material requirements. This is the only way that we will be able to substantially reduce the footprints of the building sector on the environment.

In the past few years, since we began work, we have revealed that even though the Indian government provides financial incentives for green buildings, interventions have been largely ineffective. This is mainly because standards for performance are weak and the sector remains opaque. CSE has argued for India needs performance-based policies, as measures including voluntary green rating of new buildings are currently not linked with actual performance monitoring of the buildings. Furthermore, our analysis of energy efficiency building code (ECBC, see box) revealed flaws in the existing code and we have argued that its implementation would result in locking up of huge energy and carbon in inefficient buildings. Our objective is to work with official agencies to create systems for quantifiable monitoring and audits for official assessment of actual savings from green building interventions.

On Energy Conservation Building Code

Simply put, the Energy Conservation Building Code (ECBC) sets norms and guidelines for walls, windows, roofs and skylights or the building envelope; use of daylight and electrical lighting; mechanical ventilation, air conditioning and space heating; motors and transformers etc to improve energy efficiency of buildings. The Bureau of Energy Efficiency claims that while the average energy performance of standard buildings in India is about 180 kwh/sq m/year, the ECBC compliance can improve energy performance to 120-140 kwh/sq m/year. But in reality, there exists no survey to back this claim.

Moreover, the implementation of this code has become technology-centric and sidelines creative architectural solutions for energy prudence. CSE's analysis of code shows that prescriptions mandated by the code for heating, cooling and lighting will push the future commercial building stock to become captive users of mechanical air-conditioning and heating as well as excessive use of glass in facades, pushing the national energy performance average higher. This code does not encourage buildings to take advantage architectural design blended with the advantages of local climate adequately to reduce needs for mechanical cooling and heating and lighting. The code does not cap the consumptive lifestyle-driven aspiration for energy guzzling buildings, but accepts it as inevitable. Being technology-driven, this code ends up promoting the market for high-end building materials, expensive insulation products, glass and chemicals that are marketed by a handful of companies. Thus, the way the code is designed and being implemented is leading to unintended consequences. ECBC requires urgent reform.

Building green

is about buildings which optimise on the local ecology, use local materials as far as possible and most importantly, build to cut the power, water and material requirements

There are also multiple regulations for environmental clearance of buildings which lead to poor decision-making and even poorer monitoring of projects. There is also great opportunity to improve resource efficiency in this sector. CSE's initiative in this programme will be to focus on the reuse of construction and demolition waste—this material ends up being dumped in rivers and other waterbodies and adds to the crisis. Our research has pointed towards major lacunae in the current policies that do not allow the use of recycled construction waste in buildings.

We also see the need to build a strong constituency for these ideas and to ensure that the curriculum of architecture is changed so that it reflects the opportunity for real transformation in this sector.

The strategy for implementation

Based on our past work, we have identified the following initiatives:

Initiative 1: Build a strong public support for green buildings through workshops and conclaves, articles, films and popular books. The particular objective will be to influence policies on low cost affordable housing and slum redevelopment, which promote architectural features and materials to improve thermal comfort and effective energy use to meet the community and livelihood needs of the urban poor.

Initiative 2: Research and advocacy to change the Energy Conservation Building Code (ECBC) for more effective performance in buildings.

Initiative 3: Research and advocacy for reform in environmental regulations for cohesive and effective performance-based monitoring of green buildings.

Initiative 4: Influence policies on recycling of construction and demolition waste in buildings.

Initiative 5: Review architectural education curriculum to understand how best to address environmental concerns.

Initiative 6: Facilitate setting up of a formal Sustainable Building Network of architects and allied services professionals. As the green building sector gains momentum, there are several emerging and eminent architects, building experts and engineers who have been innovating and pushing for the adoption of green aspects in the building sector. In addition, there are several grassroots and civil society groups involved in taking up reforms in the building sector and promoting traditional wisdom in building practices. These initiatives need to be documented and disseminated. This requires assessment and scoping studies to come up with a strategy for a formal network/forum to engage and partner with these national, regional change agents to build awareness on green building issues. ■

The key outcomes

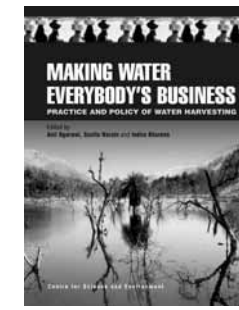
- Achieve change in Energy Conservation Building Code (ECBC) for effective performance and road map for reduction in energy use in buildings.
- Inculcate increased use of low-cost green technologies in the affordable housing sector for improved thermal comfort.
- Introduction of new standards on recycled aggregates by Bureau of Indian Standards and its adoption by public and private works departments.
- Reform environmental regulations for buildings so that there is transparent and accountable system for appraisal and post-project monitoring.
- Build a constituency of green architects in the country though a formal Sustainable Building Network; also, build a cadre of young architects through curriculum reforms in architecture schools and colleges.
- Build up a public communication and awareness programme and a media strategy on green architecture, regulations and habitat management to generate public opinion and enhance public understanding and support for change.

Water-Waste

The imperatives and proposed role

CSE's water programme in India has evolved to help establish policy principles, innovative technologies and implementation strategies for water and wastewater management—these efforts have been directed towards meeting the twin goals of laying the foundations for a water-prudent society and adapting for climate resilience. We believe this experience needs to be leveraged to share solutions with other countries in the developing world—from South America, Africa and Asia—that are enjoined in a common struggle to find ways of meeting the needs of urban and rural populations in the current water and wastewater paradigm. The South needs solutions which are affordable and sustainable and which can lead to distributed wealth generation.

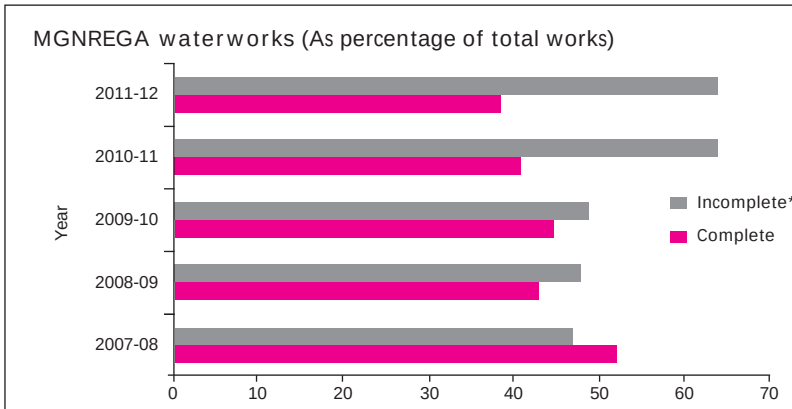
Two seminal publications from CSE have set the tone for its work on water: *Dying Wisdom* and *Making Water Everybody's Business*



CSE has been an important thought-leader in this sector. It has already influenced global policies and strategies to focus on the need for technologies to augment water resources in a decentralised manner through rainwater harvesting and to use that water to optimise on benefits. In fact, CSE's massive documentation of the extraordinary wealth and ingenuity of people living across different ecological systems to manage water (*Dying Wisdom: The Rise, Fall and Potential of India's Traditional Water Harvesting Systems*) is a guide on reinvention of solutions for today's challenges. Today, rainwater harvesting has been made mandatory in many cities in India and several states as well as the central government have launched schemes to popularise and support it. In addition, the Indian government has recognised the need for decentralised water management strategies in its rural employment generation programme (MGNREGA). The challenge is to ensure effective implementation of these programmes so that there is wider acceptability and upscaling.

Water-poverty-livelihood-climate change connect

India's experience has demonstrated that the issue of water is not about scarcity but about its careful use and its equitable and distributed access. Water is the starting point for the removal of poverty. It becomes the basis of food and livelihood security. Our work has shown that water management strategies must be designed to harvest, augment and use local water resources so that they lead to local and distributed wealth generation. It is also clear that local and distributed water infrastructure will require new forms of institutional management as water bureaucracies will find it difficult to manage such vast and disparate systems.

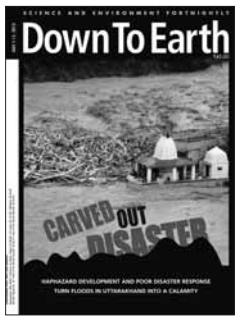


*Incomplete works include in-progress/suspended works and those approved but not in progress; *Source: Union ministry of rural development*

In India, under MNREGA, over 5.5 million water conservation structures have been created in the past eight years (*see graph*). But the fact is that thousands of these valuable assets remain

Down

To Earth's coverage of issues related to water ranges from drought (in Maharashtra) to floods (in Uttarakhand)



incomplete or simply abandoned. The programme, built on the right to employment, does not emphasise the need for completion of the developmental work. In this way, drought relief is not used to become a permanent relief against drought and water insecurity grows. This must change, we believe.

This adds to the crisis of groundwater availability, as recharge is limited but withdrawal is unabated. Groundwater—a resource under the land of individuals and under their control—irrigates the bulk of lands in India and not surface irrigation systems. The intense use of this resource has meant that groundwater levels across the country are falling sharply. What we have to recognise is that groundwater is a replenishable asset and what is needed is to recharge wells, so that annual extraction is limited to what is sustainable. In other words, we work groundwater like a bank. Live off the interest—what is recharged—and not the capital.

But even as groundwater has overtaken surface water systems, other irrigation systems—tanks, ponds and all other community-based and decentralised water harvesting systems—have simultaneously declined. But the fact is that these systems played a critical role in the recharge of groundwater as they stored rainwater, which then recharged underground aquifers. These were the 'distributed' sponges without which 'distributed' water management would not be possible. Therefore, we are extracting more and more, recharging less and less.

Climate change will exacerbate the crisis of water management in India and many other countries of the South. We know today that extreme and variable weather events will increase and this will have adverse and crippling impacts on the poor, particularly farmers. There is a need to incorporate coping and adaptation strategies that will harvest rainwater and to ensure that development strategies do not exacerbate the problems of flooding. In fact, finding shared Southern solution has become necessary to build resilience to counter vulnerability to climate change in the poor South. The IPCC report of April 2014 has highlighted that the number of people to be exposed to water crisis will increase significantly in Asia and Africa. Already, approximately 80 per cent of the world's population suffers serious threats to its water security. Each degree of warming is projected to decrease renewable water resources by at least 20 per cent for an additional seven per cent of the global population.

The urban water-sanitation-pollution connect

There is no doubt that the urban and industrial centers of the South are now putting greater pressure on water resources. Cities need more water for their growing populations and more importantly, their growing affluence. Their increasing demand leads to pressure to source water from further and further away.

Today, cities extract from cleaner upstream sources and discharge their waste—sewage and industrial effluents—downstream, which in turn leads to increased problem of polluted water and ill-health for poorer users of the rivers. The capital intensity of the modern sewage system—its transportation and eventual treatment before disposal—is such that it cannot be

afforded by all users and even all urban areas. The question then is how will the modern cities of the developing world grow without creating wastewater and pollution? How will these cities innovate so that they can practise the technologies of recycling and reuse, even before their counterparts in the industrial world? The challenge is to re-invent the waste management system so that it reuses every drop of water discharged, at costs that can be afforded by all.

CSE, in its two-volume comprehensive report *Excreta Matters* (*7th Citizen's Report on the State of India's Environment*) on the crisis of clean water supply, sanitation and pollution in urban areas, has strongly advocated for reinvention of the water-waste management system. It has shown that the current method is capital-intensive, creates and maintains a divide between the rich and the poor and is natural resource-intensive (uses water first to flush, then to convey the waste). Our work has led to greater understanding of the need for review of current infrastructure projects on water-waste and to explore alternatives for waste management that are based on principles of re-use and recycling. And the advocacy that followed this publication has led to a country-wide debate that has had impacts on the National River Conservation Plan. Such efforts have also led to advocacy to push for a separate policy or regulation for septage management in cities. The 12th Five Year Plan (*see box*) of the

Reform agenda on water for India in 12th Five Year Plan (based on CSE's publication, *Excreta Matters*)

"Nothing less than a paradigm shift is required if we are to move towards sustainable solutions to urban water and waste management"

Agenda 1: Investments in water supply to focus on demand management, reducing intra-city inequity and on quality of water supplied: The biggest charge on municipal water supply today is the distance water needs to travel. Water supply programme therefore must provide for demand management and reduction in cost of supply.

Agenda 2: Protection of waterbodies: Cities will get funds for water projects only when they have accounted for the water supply from local waterbodies and have protected local waterbodies and their catchments.

Agenda 3: No water scheme will be sanctioned without a sewage component, which joins the dots with pollution of rivers and waterways: Pollution control is not possible without investment in an extensive sewage system to reach all people and intercept the waste of all for treatment. This planning for 'full coverage and costs' will lead cities to look for unconventional methods of treating waste. The

principle also has to be to cut the cost of building the sewage system, cut the length of the sewage network and then to treat the waste as a resource.

Agenda 4: Plan deliberately for recycling and reuse of treated wastewater.

Agenda 5: Plan on a regional scale: Drinking water and sanitation issues are inter-linked in urban, peri-urban and rural areas and increasingly impact each other as development upscales. Thus, a regional planning approach for provision of drinking water supply and wastewater treatment and disposal is necessary to meet the needs of both rural and urban areas and avoid duplication of schemes.

government of India has taken CSE's position to ask for changes in the funding of the urban water and sewage projects in the country.

The challenge now is to ensure that this approach is incorporated in urban design and implemented widely. The barriers to do this are as follows:

- Lack of capacity to undertake policy reforms in water governance for implementation of alternative methods and practices of water-wastewater management
- Lack of monitoring, assessment and sharing of good practices for adoption and implementation at scale
- Lack of technical knowledge and tools for implementation of alternative water-wastewater technologies
- Inadequate public and community support to enable implementation

We believe that distributed water management is a strategy for livelihood support and climate change adaptation. Our programme will work to join these dots and to find ways to nudge towards effective implementation of government programmes to up-scale impact

The strategy for implementation

We believe that distributed water management is a strategy for livelihood support and climate change adaptation. Our programme will work to join these dots and to find ways to nudge towards effective implementation of government programmes to up-scale impact. We will also use these experiences to build a much greater awareness of the opportunity for change across

other countries in the South. In addition, our programme will promote alternative urban water and wastewater management strategies for equitable access in countries of the South.

Our water-waste programme will undertake research, build institutional capacity, support implementation and promote awareness and societal engagement to achieve our goal in the following thematic areas:

- Equitable access to clean water and sanitation to all, particularly the poorest and women in society. This requires focus on alternative paradigms of water supply, like rainwater harvesting and decentralised water sources of supply. The plan will incorporate research on rainwater harvesting systems in different countries, particularly Africa, leading to strategy for building capacity, including technical capacity to implement projects on rainwater harvesting, sanitation and provision of clean water.

- Alternative waste management technologies for pollution control, to build understanding that water and sanitation strategies are interlinked and to find ways to combat the problem of pollution and resultant health burden on the poor. This requires shifts in waste management technologies to make them affordable and sustainable.

- Climate change and water to ensure development policies take into account the changes in water regimes and extreme weather events because of climate change and can promote strategies for adaptation and resilience. CSE will work to bring together best practices in different regions on adaptation and reliance to build a network of advocates for change in different countries.

To implement this, we have developed programmes teams to take on the following initiatives:

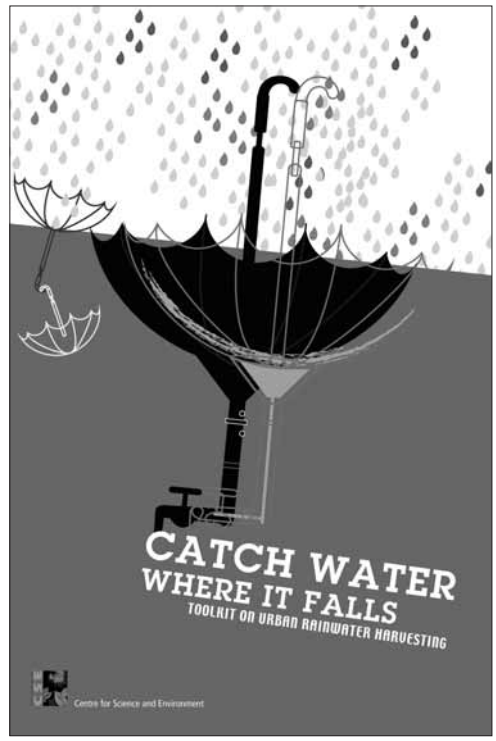
Research and advocacy initiatives

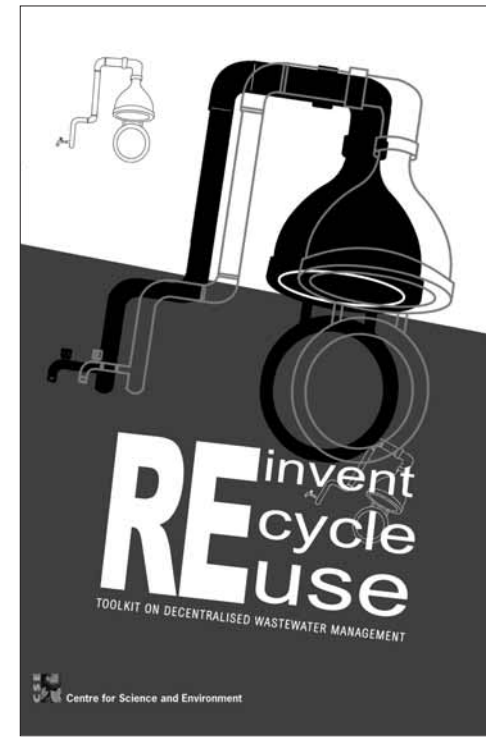
Initiative 1: Water for livelihood and resilience: Research, report and document best practices on Indian programmes for decentralised water management, including MNREGA, watershed management and other programmes for rural waterbody rejuvenation. Based on this research, the policy implications will be shared across the world and used to build similar approaches in other regions. This work will be done with the climate adaptation programme at CSE.

Initiative 2: Rural sanitation: Research, report and document best practices on rural sanitation so that water and waste management strategies work for livelihood and health.

Initiative 3: Continuous research and advocacy on urban water and wastewater systems: to fill gaps in policy and practice and to build a water literacy campaign for change.

Water solutions will require guided implementation. CSE's manuals on rainwater harvesting and wastewater treatment are tools towards such implementation





Initiative 4: Build living machines of water-waste systems at Neemli (demonstration and exhibition).

Capacity development, technical support and demonstration initiatives

Water solutions will require guided implementation in regions. In order to popularise the idea of rainwater harvesting, CSE has built several 'model projects' to showcase best practices in several cities of India and South Asia. Our water literacy campaign will catalyse public and policy interest in this issue. CSE's water programme will create regulatory capacities to address challenges in rural and urban water supply, including sustainability of water sources, hardware/systems, financial and institutional sustainability, together with water quality issues.

Initiative 1: Green rural development: Build capacity for village-level planning for source sustainability (water augmentation and conservation) and liquid and solid waste management.

Initiative 2: Urban lake conservation and rainwater harvesting: Build capacity and learning on strategies for local water body protection, rejuvenation for water supply and waste management. Also promote and build technical capacity for individual rainwater harvesting systems for local water security.

Initiative 3: Water-sensitive design and planning to push policies and practices for water audits, improved and water-efficient fixtures and appliances and planning.

Initiative 4: Decentralised wastewater management, including septage management, in urban areas: Build capacity of key implementation agencies to implement projects for decentralised sewage management and to build documentation of best practices in these technologies for further dissemination. This programme will also provide technical support for demonstration projects.

Initiative 5: Wastewater management for pollution control: Build capacity of regulators on city-wide water and sewage management and ways to incorporate affordable and sustainable strategies. ■

The key outcomes

- Build a cadre of regulators and multipliers in the areas of water and sanitation management through research and capacity building programmes for rapid uptake of innovative techniques and management practices.
- Develop a global network for sharing of best practices in climate-resilient water management practices.
- Build capacity of targeted model cities so that they commit to a time-bound plan on sustainable and equitable water provisioning and implement projects on rainwater harvesting. Influence urban project funding to design this change.
- Help incorporate decentralised and affordable wastewater management technologies in city plans.

Sustainable industrialisation

The imperatives and proposed role

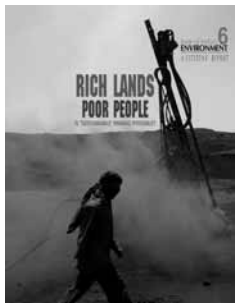
We see inter-related environmental challenges of industrial growth. First, there is the reform and strengthening of planning, monitoring and regulatory procedures, especially in the design and application of the environmental impact assessment (EIA) tools. Second, we find that regulatory systems in India and the global South are struggling to catch up with dealing with newer pollutants, even as the old pollutants have continued to grow. There are key issues of affordability of developing societies as the cost of pollution control grows. Third, there is the need to mitigate emissions and to work towards low-carbon growth strategies. All this, we believe, is not possible unless industrialisation is much more resource-efficient and works in the interests of all.

The capacity of regulatory institutions to implement environmental regulations and monitor environmental performance of industries effectively is weak in most regions of the developing world. As in India, the work of pollution control boards, including decision-making and rules for compliance and enforcement, often occur in an accountability and information vacuum. The lesson from India's environment clearance process combined with global best practices could provide a valuable Southern perspective on environmental governance in emerging economies. This will strengthen policy and implementation regimes.

Yet another barrier that industrial growth in India and other developing regions will face is the constraint of resources to grow—land, water and raw material. The low carbon strategies in the industry sector will have to be conjoined with strategies for resource efficiency. For instance, growth in the five key sectors of power, aluminium, steel, cement, and fertiliser will put a huge strain on India's freshwater resources. Even today several industries in many parts of the country stop production during dry season at an enormous economic cost. There is also growing tension between local community and industry over water withdrawal that increases risk. This will require technology invention that will reduce rate of growth of freshwater withdrawal by the industry. Similarly, India like several other developing countries, has an adverse land-population ratio. Thus, land for expansion of industry and mining as well as low carbon strategies such as hydropower in power sector will be severely constrained. Resource constraints on industrial growth will be a unique and special Southern challenge and Southern governments will have to learn to balance these goals.

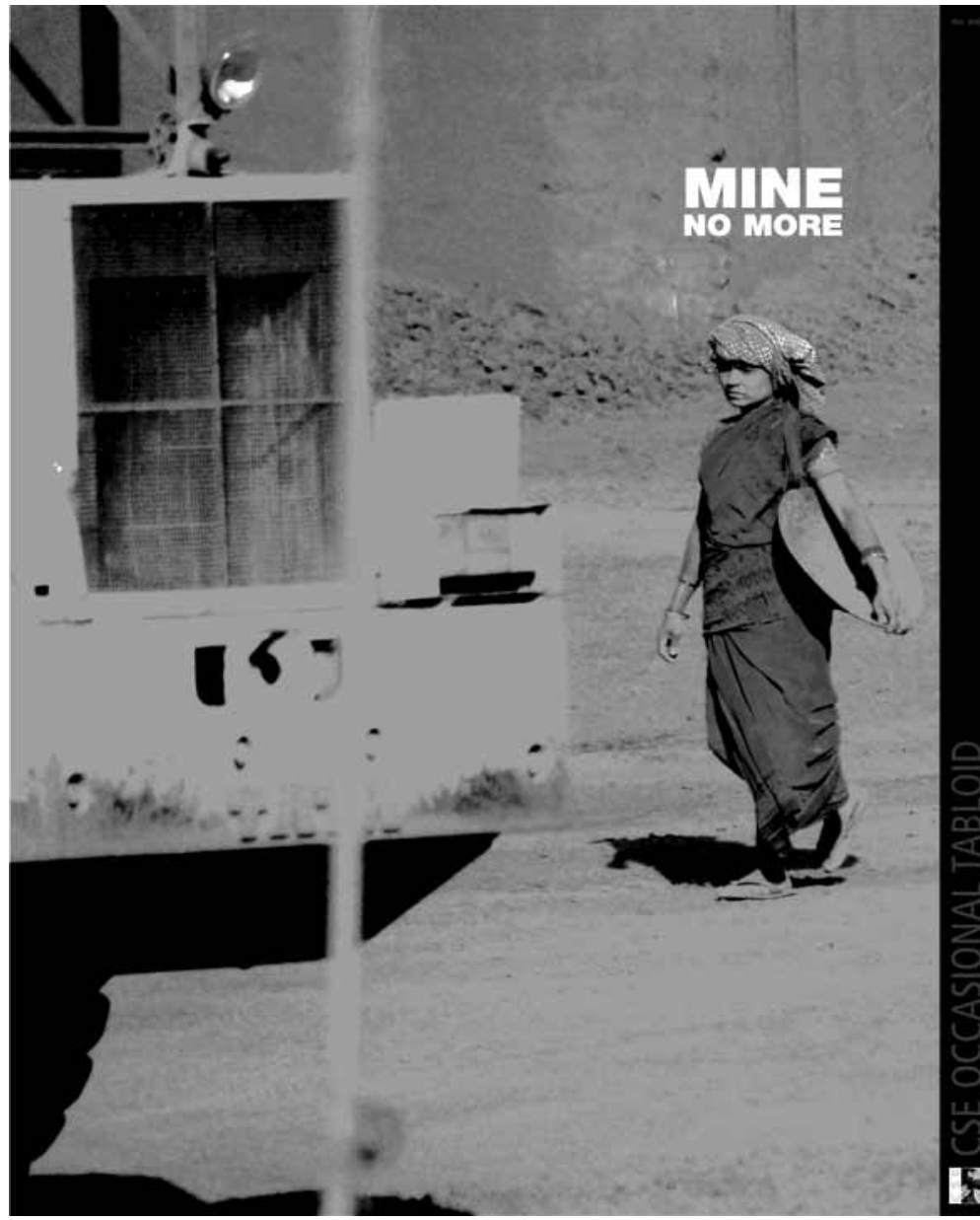
Despite the challenges, industrial growth in India and developing economies presents an opportunity to pave way for cleaner pathways. The advantage of delayed economic growth in the South is evident in the comparatively better energy performance of several large-scale sectors including cement, aluminium and fertilisers; in India, these already feature among the global best. These sectors, such as cement, being newer have modernised their technologies and therefore are among the most energy-efficient sectors in the world today. This advantage of the Southern world needs to be informed and guided well and leveraged effectively. Significant efficiency improvement and energy savings with climate and local co-benefits are possible in several sectors that can be supported through global cooperation. India has already

Despite the challenges, industrial growth in India and developing economies presents an opportunity to pave way for cleaner pathways



Mine

no more. A tabloid that followed CSE's mammoth study on mining titled *Rich Lands, Poor People*. Both looked at reducing environmental damage from the extractive industries



declared that it will voluntarily reduce emissions intensity of its GDP by 20-25 per cent by 2020. Other Southern governments will also work with their respective targets. But such improvements will require crossing the technology threshold that can present a daunting cost challenge for developing economies.

Our sustainable industrialisation programme seeks to prevent lock-in of greenhouse gas emissions and local air pollution, promote optimal resource use, and reduce environmental damage from extractive and manufacturing industries even as the emerging economies grow to reduce poverty and improve standard of living. The long-term goal of this programme is to push for changes in the clean technology roadmap for energy and resource-intensive industries and strengthen the environmental governance and regulatory capacity in the Southern regions for low carbon growth and less resource-intensive pathways.

At the global level, greenhouse gas emissions from the industry sector is expected to be significant and also increase substantially within the next two decades. In this, the countries of the South have a unique challenge. Not only their industrial production process will damage environment and public health, industrial growth itself will be constrained by the limited resources of land, water and natural raw materials. If low carbon growth and resource efficiency are not addressed together this will undermine their economic growth, aggravate environmental and livelihood crisis, and compromise quality of life and low carbon strategies.

GRP

It audits the environmental performance of industry, has had major impact as a tool to improve performance of industrial sectors.

CSE's Green Rating Project (GRP), which audits the environmental performance of industry, has had a major impact as a tool to improve performance of industrial sectors. The project helps motivate industries in sectors that have a high environmental impact—such as pulp and paper, cement, automobiles, chlor-alkali, coal-based thermal power, among others—to make improvements in reducing pollution and bettering the efficiency of resource use. The ratings follow a life cycle assessment approach and involve an assessment of hundreds of indicators, including the impacts on air and water, solid waste pollution, compliance performance, occupational health and safety practices and local community perceptions. The programme serves as a model for an alternative form of civil society governance to control industrial pollution in India. Today, a good GRP rating is considered as a valuable certification about a company's environmental performance. In 2014, we will work on thermal power stations which have major impacts on local and global environments (*see box*).

Our goal is to also influence the regulatory framework, capacity and practices of Southern governments for environmental management of industries. This will address environment impact assessment of top emitting industries that have large environmental impacts, such as steel, cement, aluminium, petrochemicals and extractive mining as well as good management practices for small-scale industries. It will seek regulatory capacity and innovative fiscal policies to catalyse investments in efficiency and improved environmental management in targeted sectors.

Coal-based thermal power sector

Coal based thermal power will continue to dominate the energy mix in the South to meet the energy needs of the poor, at least until the eventual energy transition to more efficient energy sources, such as renewable energy. Resource efficiency remains a chief concern of this sector, where it finds resonance with the energy security debate at the national level and with 'clean coal' and debates around the climate-energy nexus at the global level.

Action here includes pushing for a standards and technology roadmap for the sector, including supporting policies to replace inefficient, older generation conventional power plants with improved super critical technologies, promoting good practices in resource efficiency to lower the sector's overall environmental impacts, and promoting innovative fiscal measures to promote efficiency. It also calls for engaging with plant-level improvements, including pushing for thermal efficiency measures to match 40 to 45 per cent global best targets, substituting polluting coal with refuse-derived fuels (RDF) and the reuse of flyash. Measures also include use of recycled wastewater, and more efficient land use. This will be complemented with research on how to reduce the sector's carbon imprint and pollution load, thermal/solar co-generation, aligning particulate matter (PM) standards of old plants with global standards, and pushing for more stringent regulation on common pollutants, such as NOX, SOX and mercury.

The strategy for implementation

The sustainable industrialisation programme will build deep engagement with the targeted national governments in the emerging economies as well as with the global processes

We propose to build a 'Centre of Excellence' on environmental management in the South that will promote South-South cooperation primarily among the community of environment and pollution regulators. The Centre will be a learning and innovation facility engaged in sharing of knowledge and best practices in environmental regulation and management, and strengthening of institutions across the global South. The programme will work with a large number of tools including environment impact assessment, sector-specific emissions standards, voluntary initiatives in specific sectors, and incentives for compliance beyond standards. A new global network of industry regulators will bridge the knowledge gaps and spread best practices.

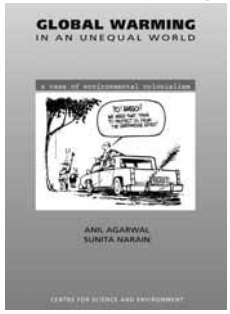
The sustainable industrialisation programme will build deep engagement with the targeted national governments in the emerging economies as well as with the global processes. Several governments are now grappling with the challenge of developing robust environment impact assessment strategies for effective mitigation and are looking at the emerging global learning curve for replication. Inter-governmental deliberations under the global processes in the relevant areas will also increase in the years to come. This is an opportunity for this programme to influence this process for meaningful impact. ■

The key outcomes

- Research and advocacy on resource efficiency: Assess the sustainability parameters of resource-hungry and polluting industrial sectors and push for resource efficiency parameters to catalyse the transition to green economy.
- Research on thermal power in 2014 to help catalyse improvements in the plant and at policy levels.
- Push Southern priorities on resource efficiency and improved pollution control frameworks: Engage with multilateral global platforms such as the Marrakech process, UNEP's resource efficiency programmes, World Economic Forum, UN sustainable development goals; and engage with governments, industry associations, trade bodies, multilateral finance agencies on resource efficiency
- 'Centre of Excellence' for improved environmental management: Create a network of environmental regulators and change agents to share knowledge and best practices in environmental regulation and management; strengthen regulatory capacities in the areas of environmental and social impact assessment (EIA and SIAs), pollution control and prevention and resource efficiency; and catalyse institutional reform to strengthen regulatory practices in targeted countries.

Climate Change

Equity



gained currency with our publication *Global warming in an unequal world: A case of environmental colonialism*

The imperatives and proposed role

CSE has played a major role in shaping international climate negotiations. Our publication *Global warming in an unequal world: A case of environmental colonialism* was instrumental in advocating the idea of equity in climate change negotiations. Today, equity and 'common but differentiated responsibility and respective capability' are the foundations of the UN Framework Convention on Climate Change (UNFCCC).

CSE has always believed that it is in the interest of the developing countries to get an ambitious and equitable climate mitigation deal, as they will be the worst sufferers of the impacts of changing climate. A warming world means that the poorest in the developing countries are going to bear the brunt—from failing monsoons to sea level rise and from increase in extreme weather events to water scarcity. Climate change will make poverty alleviation even more difficult.

CSE, therefore, has on one hand advocated an ambitious and equitable global deal in which the developed world takes the lead in cutting its emissions and supports developing countries to move towards a low carbon growth path; on the other hand, we have pushed low carbon growth and climate co-benefit agenda in India. We have pushed for tighter fuel efficiency norms in automobiles. We are demanding tighter emission norms for diesel vehicles to reduce black carbon emissions. We have advocated ambitious renewable energy and energy efficiency targets and have worked with the government to design one of the world's most ambitious solar

OTHER CSE PROGRAMMES WORK ON CLIMATE MITIGATION

PROGRAMME	INITIATIVES	OBJECTIVES
Sustainable industrialisation	Resource efficiency improvement in thermal power plants in India	Cut emissions in coal-based power plants for major climate benefits
Green building	Reform of energy regulations (ECBC)	Make buildings more energy-efficient
Renewable energy	Mini-grids, global feed-in tariffs, upscaling solar rooftop and wind in the energy portfolio	Work to upscale renewables and make clean energy accessible to poor
Air pollution	Clean air and clean diesel (including black carbon) Reinventing mobility and car restraint strategies Long range transportation systems	Reduce black carbon emissions Reduce CO2 emissions Contribute to global agreements to reduce GHG emissions
AAETI	Brick kiln Municipal solid waste	Reduce black carbon emissions Reduce methane emissions

energy programmes: the Jawaharlal Nehru National Solar Mission that plans to install 20,000 MW of solar energy in India by 2022. We have benchmarked industries on energy and climate emissions and have developed and demanded a low carbon growth strategy for them. We are asking Indian industry to leapfrog from HCFC to low-ODS, low-GWP alternatives and bypass the use of super greenhouse gas HFCs in the refrigeration and air conditioning sectors. In fact, many programmes at CSE work on the principle of mainstreaming climate mitigation (*see table*).

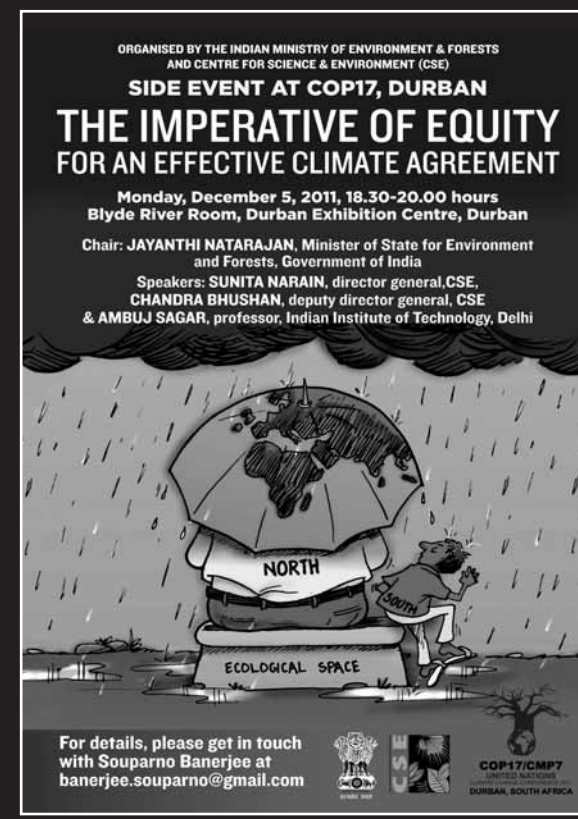
But we also recognise that in the warming world mitigation is not going to be sufficient. Countries like India are already experiencing climate change and we will need to mainstream climate adaptation in all our developmental plans and policies: agriculture, water, forests, fisheries, urban infrastructure etc. In this regard, we have worked with the government to mainstream decentralised water management as an adaptation tool in the world's biggest employment guarantee scheme, the Mahatma Gandhi National Rural Employment Guarantee Programme (MNREGA). And we continue to advocate a rights-based approach to natural resource management in the country as a key institutional tool to combat climate change.

CSE also recognises the importance of building knowledge and capacity in the society to deal with climate change. We have set up the India Climate Research Network (ICRN) in association with with IIT-Delhi, IIT-Madras and IISc-Bangalore to promote climate research in India. We organise workshops and trainings for South Asian media to understand climate change. We are training the probationers of the Indian Foreign Service on the nuances of climate change negotiations. We have set up an expert group to do research on loss and damage arising out of climate change in India.

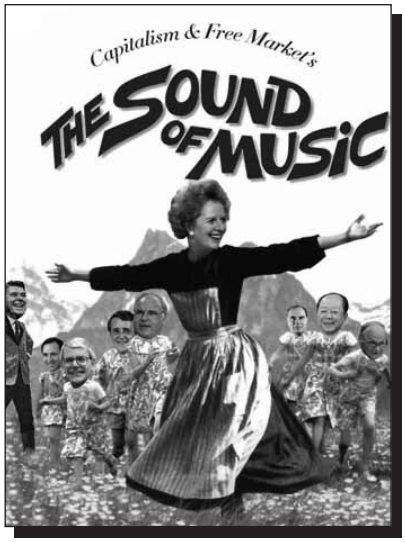
Our climate engagements

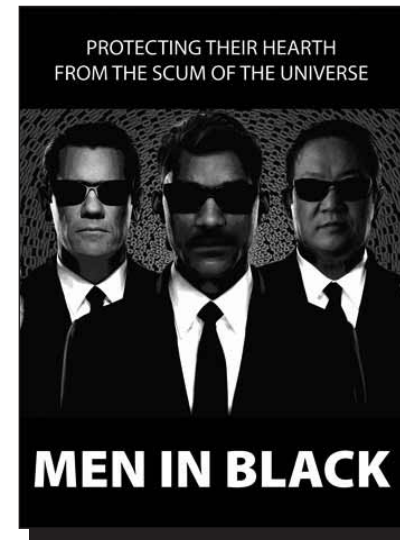
CSE has consistently tracked climate change negotiations and co-hosted side events at CoPs with the government of India; reported on climate change impacts on cities, economy and rural areas; built knowledge and interest of journalists from developing countries on global climate science and politics; engaged the youth in south Asia on climate politics, policies, and practices; established a comprehensive climate change information repository of research and policy documents, best practice documentation, news and features; and participated in leading global networks to vociferously demand the equity principle in global climate politics.

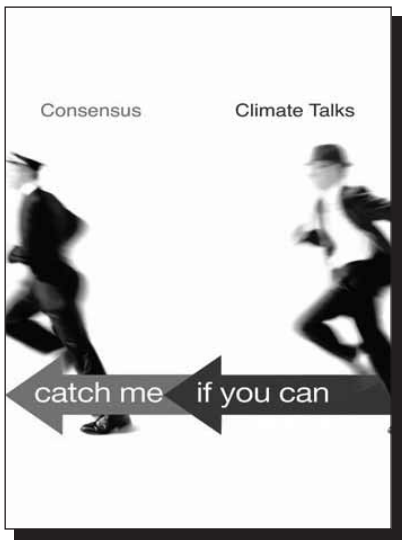
At the Durban CoP held in 2011, CSE organised a side-event in which the then environment minister Jayanthi Natarajan—along with CSE—re-entered equity into the terminologies of climate negotiations. The poster of the event is here....

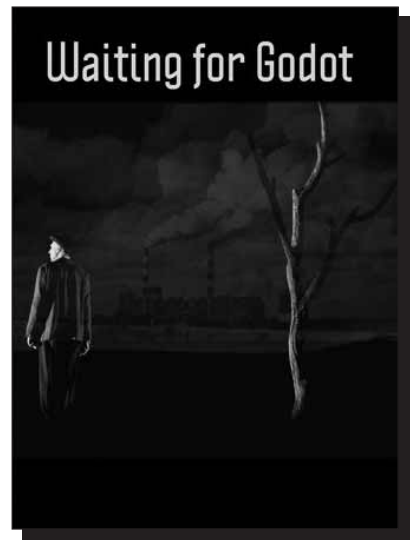


Climate Talkies... 2013. The CoP in Warsaw. CSE put up a unique exhibition of posters, a cinematic walk through the journey of 20 years of climate negotiations. Our way of telling the world what happened...









For complete online exhibition, please visit, http://indiaenvironmentportal.org.in/climate-talkies/

What we will do

The guiding principles of CSE's climate programme for India is to push for low carbon growth strategies, mainstream climate co-benefits, and build a climate-resilient society. Internationally, we will push for an ambitious climate deal based on equity, fairness and historical responsibility. We will also work globally to phase out HFCs.

We will push for an ambitious climate deal based on equity, fairness and historical responsibility

In the coming years, we will build on our past initiatives and strengthen our programme in the following thematic areas:

- Adaptation and loss and damage
- An ambitious, effective and equitous global deal
- Building capacity of media, negotiators and network of scientists and practitioners to advance the agenda of combating climate change

The strategy for implementation

Initiative 1: Adapting to climate impacts and loss and damage

CSE has been working to develop an effective adaptation programme for the past few years. The fact of the matter is good adaptation to climate change is about good development, delivered urgently, and at scale. Therefore, adaptation, we believe, requires effective implementation and delivery of existing government development programmes.

Currently, these programmes are expected to deliver on the need for water conservation, agricultural support, public health, forest-based livelihoods, improving small-scale fisheries, flood management etc. If these existing programmes delivered on their designed outcomes, it would build resilience to better cope with climate change.

Additionally, we know that adaptation is more than a business-as-usual development. Climate change will bring in new challenges of extreme weather events and slow onset events. Therefore, adaptation to climate change at one level demands delivery of better and faster development programmes, but these development programmes will have to be informed of changes that will happen due to climate change. This means that an effective climate change adaptation will demand incorporating climate change impacts in plans and policies.

Based on these learnings, CSE's adaptation programme will do the following:

It will focus on understanding impacts of climate change and identifying 'best practices' that are already taking place on the ground. Such understanding should translate into influencing development policies in developing countries and lend answers on how to incorporate climate change impacts in their plans and policies.

This understanding and knowledge will also be used to influence international negotiations on finance and technology support for developing countries to adapt to climate change. Furthermore, this can be used to design a global regime on loss and damage based on liability for apportioning costs of climate change.

Initiative 2: Research and advocacy for a climate deal based on equity

This initiative will focus on climate change negotiations and the global deal to emerge from it in the near future. At the heart of it will be advocating for a global deal that will find its basis in equity: how should it be operationalised? What does 'equity' mean for the South? It will pool in resources and knowledge from several fields to understand how climate change mitigation is taking place in the world and identify gaps and opportunities. CSE will also focus on critiquing the exiting framework for equity (reference framework) and prepare documents for negotiators.

HFCs

As part of a climate-sensitive growth strategy, CSE is already engaged with global processes to find cost-effective and climate-friendly solutions for the South. CSE's campaign on hydrofluorocarbon (HFC) use in industry contributes to the global agreement to phase down HFCs by 2030 under the Montreal Protocol but within the principles enshrined by the UNFCCC, including equity and common but differentiated responsibility. The HFC initiative has been shaped by the fact that global climate mitigation strategies for industry are also leading to unintended consequences and this should be prevented in the developing world by tapping the learning from the developed world. This is particularly relevant in the case of HFCs used as coolants in products, a gas that has a thousand times more climate warming potential than carbon dioxide.

Currently, HFC use in developed countries is very high, where it was introduced to replace ozone-depleting substances. The same countries are now under pressure to phase out HFCs. Developing countries where HFC use is still low, have the opportunity to make the one-time transition but only if supported with cleaner technology and fiscal strategies to facilitate this transition. HFC phase-out requires local strategies that engage with industry with global support for cleaner technology and financing. The science, technology and finance questions around this issue will require global and multilateral efforts.

Our other focus will be 'ambition' as the world needs an effective deal urgently. We will look at mitigation plans of key developed countries on transport, renewable energy and thermal power sector to identify the ambition gap and the need to fill these gaps for meeting the 2-dergree target.

Initiative 3: Global campaign on HFCs

HFCs are refrigerants that are harmful environmentally; they keep the chemical treadmill running which ensure profits to some companies at the cost of the environment. This initiative will focus on getting a global deal on phasing out HFCs in a manner that is equitable and ambitious and takes into account the perspectives of the global South.

CSE will do papers on the existing use of HFCs, alternatives and challenges to transitioning to climate-friendly alternatives in developing countries. It will also look at the techno-economic feasibility reports for developing countries to leapfrog directly to climate-friendly alternatives and not go through the HFC-alternate chemical route. It will work to convene meetings on this issue in India and at the meetings of the Montreal Protocol.

Initiative 4: Build knowledge and capacity of stakeholders for ambitious and equitable climate deal and climate resilience

This initiative is a crosscutting effort between the media, climate change and other teams at CSE to build knowledge and capacity in the society to combat climate change. It targets a wide range of actors across the spectrum—scientists, journalists, negotiators and diplomats—to ensure that Southern perspectives and research stay updated and relevant to the discourse on climate change at the international level and in national plans and policies.

CSE will continue to work with developing country scientists; build capacity within journalists of developing countries and bring them up to date on climate politics and policies; and extend its current programme to build capacity of Indian Foreign Service probationers to negotiators from the global South to engage effectively in climate change negotiations. ■

The key outcomes

- Advocacy and phasing out of HFCs under the Montreal Protocol by 2030 and transition to non-patented chemical alternatives.
- Push for an ambitious and equitable climate deal under UNFCCC. Ensure that concerns of right to development are incorporated.
- Push for an international mechanism on adaptation and loss and damage that takes into consideration climate change liability and compensation for impacted communities.
- Build knowledge and capacity of stakeholders for ambitious and equitable climate deal and climate resilience.

Renewable Energy

The imperatives and proposed role

The world needs to find solutions for energy access for the poor in a climate-challenged world. We believe this requires national and global strategies for a transition to clean energy sources (electricity and cooking fuel) through decentralised, distributed and democratised renewable energy solutions, while accommodating for environmental and social externalities.

CSE's approach brings together the energy access agenda often associated with conventional energy, with the renewable energy agenda that has climate benefits, to help catalyse a transition to clean energy in the developing country context.

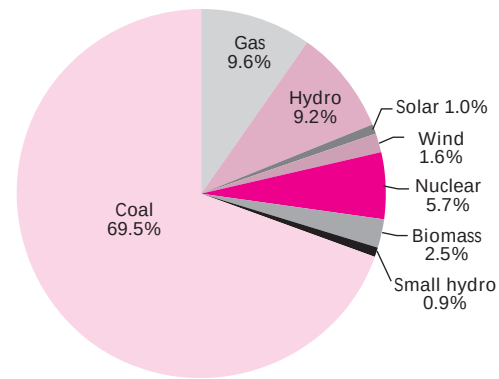
The global South suffers from chronic energy poverty. In 2010, nearly 1.3 billion people did not have access to electricity. Two-thirds of these energy poor are in 10 countries—India, Bangladesh, Nigeria, Ethiopia, Indonesia, Congo, Pakistan, Tanzania, Kenya and Uganda.

These countries are paying huge developmental costs for this energy poverty—education, health and economic development is getting stymied because of this. Growth in these regions and inclusive access will push up demand for power several fold in the next couple of decades. Energy poverty in these countries is, however, also an opportunity to help design a new energy future that leapfrogs over polluting fossil fuel grid to clean and futuristic energy sources.

Despite being the sixth largest producer of electricity in the world, India's per capita consumption of power remains very low—only 44 per cent of rural households in the country are electrified, which reflects lost economic opportunities and exacerbates poverty. Demand for electricity is growing at a relentless pace, while urban and industrial electricity consumption is also rising on the back of increased economic growth and consumption—India's gross power production will grow 4.5 times in the next two decades. In a business-as-usual scenario, much of this electricity demand will be met by coal-fired power plants and the contribution of renewable energy (excluding hydropower) will be as little as five per cent (*see graph*).

The CSE 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 are immense—energy security, climate protection, reduced pollution and health benefits. However, challenges to upscale remain. There is urgent need for a long-term plan to move from subsidy, incentives and tax exemptions

Generation in Business As Usual scenario (2030-31)



Source: Green Rating Project, 2009, Centre for Science and Environment, New Delhi.

We need to find solutions for energy access for the poor. CSE's series of publications, including its latest Citizen's Report (below), all point to this concern

CSE's work in India shows that there are policy opportunities to intervene and push for large-scale deployment of renewable energy

and allow renewable energy to reach grid-parity and most importantly to play a role to provide access to large numbers of energy poor.

CSE's work in India shows that there are policy opportunities to intervene and push for large-scale deployment of renewable energy. For instance, the initial target of the Jawaharlal Nehru National Solar Mission is to achieve solar power capacity of 20,000 megawatt (MW) by 2020 and deploy 20 million solar lightning systems for rural areas by 2022. Robust regulatory and fiscal mechanisms are needed to ensure large-scale adoption of economically viable solar power generation in the country. Similarly, wind power generation has also seen recent boost in the country, spread across the states of Tamil Nadu, Maharashtra, Gujarat, Karnataka and Rajasthan, where project developers are given several fiscal incentives in the form of tax exemptions, accelerated depreciation, loans, etc.

There is an urgent need to intervene to shake off institutional complacency for an integrated long-term vision for renewable energy, one that promotes inter-linkages and coordinated policy action among fractured governance systems. There is constant need for policy and regulatory oversight, and a people-centric mechanism that allows for course-correction and increases the level of ambition in the RE sector in India.

The developing world has much to learn from India's attempts to mainstream renewable

energy. Power tariffs and subsidy regime always need close surveillance—for instance, new guidelines to fix Renewable Purchase Obligations (RPO) by electricity utilities for quicker uptake of renewable energy. In many cases, incentives have led to significant capacity addition but not to adequate capacity utilisation. Some changes have been made in the fiscal incentives to switch to generation-based feed-in tariffs, especially for wind power projects feeding into the grid. There is need for green norms for this 'green' energy, including environmental safeguards to reduce the significant ecological impacts of this rapidly growing sector. The impact of wind power on forest ecology can be very high if proper environment impact assessments are not carried out, while large solar projects are land and water intensive. Such safeguards will become important as renewable energy is ramped up around the world. These are valuable lessons for the South.

The strategy for implementation

CSE renewable energy team will have the following thematic areas:

- Policy framework to develop sustainable decentralised distributed generation system to provide electricity access and financing through a global feed-in-tariff regime
- Policy framework for up-scaling renewable energy in the energy portfolio —emphasis on solar rooftop and wind power as major drivers of this transition.

Initiative 1: Energy access through renewable energy—distributed grid interactive mini-grids: Our work will be to learn best practices on building mini-grids and to use this to push for policy on mini-grids and then influence its implementation (*see box*).

Initiative 2: Energy access through renewable energy—global feed-in tariff: Work to contribute to a global feed-in-tariff model to make clean, decentralised energy more affordable for the poor in the target countries and enable a rapid uptake of clean energy across the energy starved developing world. As a big solution to the climate conundrum, renewable energy is as yet too

Mini-grids

Mini-grids have emerged as an innovative way to upscale decentralised energy generation and distribution to provide clean energy to the poor. The term refers to a system where one or many energy sources and storage systems – diesel generator sets, biomass gasification units, micro hydro plants, solar PV, or even hybrid models – are interconnected to a distribution network but not connected to the main grid. Mini-grids are located in remote villages and deployed by institutional users in urban and peri-urban areas.

The micro/mini-grid has become a buzzword in the developing world in recent years. A lot of emphasis has been given to sustainable development of mini-grid models in order to address electricity access issues in rural areas. Although there are several mini-grid models, none of them has been proved to be commercially viable. Several factors like tariff regulations, feed-in tariffs, interaction with the main grid, and operations and maintenance stand in the way of viability of these mini-grid models. Often, such systems are typically targeted at the poor and are built too small to match needs or aspirations.

A more viable option is to build grid-interactive mini-power plants, funded through a feed-in tariff, and where the cost of expensive electricity for the poor is offset partly through generation-based incentives and partly through tariffs collected locally by the developer.

Mini-grids were originally intended for villages where the grid has not reached or shall never reach. However, this limitation was removed subsequently in 2013 when the ministry of power's decentralised distributed generation (DDG) programme allowed the establishment of mini-grids in electrified villages receiving less than six hours of electricity per day. Mini-grids have the potential to democratise the energy marketplace and to become a source of reliable, affordable and environmentally sustainable energy for the poor.

expensive for the rapid uptake by countries in the global South. A globally funded feed-in-tariff regime is a promising mechanism through which poor countries can mainstream and subsidise this clean energy source, and make energy more affordable for the poor. Our effort will be to build a strong coalition to develop a common framework on global feed-in-tariff regime and to advocate for a global deal.

Initiative 3: Scaling up renewables—wind energy: Wind industry provides the biggest potential for renewable energy in a country's energy mix. CSE will continue to advocate for policies that will build a truly green wind energy sector. We will research on the current barriers for grid interaction of wind power (including other renewable energy as well) in India, learning from best practices across the world and possible policy recommendations for large-scale renewable energy deployment through national grid.

Initiative 4: Scaling up renewable energy—rooftop solar: Considering population density of 382 per sq km and solar irradiation of 6-8 kWh per sq meter per day for 280 days a year, rooftop solar has a huge potential India. As the demand of electricity in urban cities is rising, a significant amount of this demand can be met using rooftop solar installations. There can be various models for urban solar rooftop. It can be completely isolated off-grid model which serves the requirements of a house or a society or it can be net metering or feed-in-tariff model where rooftop power producer can sell excess power to the grid. CSE will develop a white paper analysing the state-level rooftop policies currently prevailing in India and come out with recommendations for national rooftop solar policy. The policy will be disseminated through active campaigns and national / state-evel meetings.

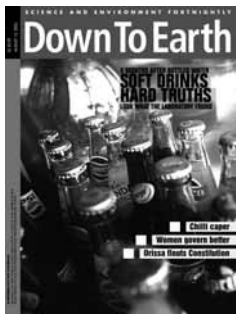
Initiative 5: Research and advocacy on renewable energy: Our report on *State of India's Renewable Energy* provides an agenda for renewables. We will advocate for its implementation and continue to do research on these sectors for greater impact. ■

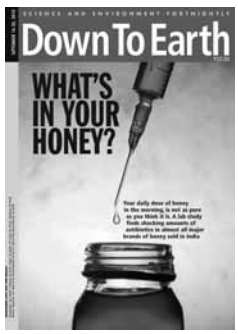
The key outcomes

- Energy access through renewable energy: Research and advocacy to promote decentralised, distributed renewable energy (mini grids) to enable democratised energy access for the poor. Get a framework policy, financed by Clean Energy Fund, to upscale mini-grids in India; learn from rest of world and get renewables to meet energy access needs.
- Energy transition to clean energy: Influence national-level policies and regulatory practices to mainstream wind and solar rooftop technologies to effect an eventual energy transition to renewable energy. Learn from other countries and take experiences from India to rest of world for affordable and sustainable energy transition for a increasingly at risk planet.
- Global feed-in-tariff for energy access for the world's energy poor: Contribute towards the design and development of a global feed-in-tariff mechanismto enable the rapid uptake of clean and inclusive energy access for the energy-deprived South.

Food Safety

CSE's acid test came when its laboratory tested pesticides in cola and was faced with powerful opponents. But there was no turning back after that. More recently, we have taken on the honey industry and the junk food sector with equal gusto





The imperatives and proposed role

When Anil Agarwal, CSE's founding director, decided to set up a testing laboratory for toxins and environmental contaminants we could not understand his reasoning. CSE had no track record in doing analytical testing, let alone running a state-of-the-art environmental monitoring facility. We were a policy research institution, comfortable with using our information for policy change. But Anil was convinced that this laboratory was essential. He said that we desperately needed science in the public domain that would challenge, indeed raise, critical issues of ecological security. His reasoning also stemmed from the fact that every time CSE had approached laboratories for testing contamination we had either been turned down—government and university laboratories said "this is too controversial" and private laboratories were just too expensive. As a result, even where we knew these was a problem, we could not test and therefore, could not prove that there was evidence of contamination and so we could not successfully push for change. In 2000, the CSE Pollution Monitoring Laboratory (PML) was set up (*see box*).

The first test of the laboratory came by chance. We had a letter in the post from a doctor who wrote to say that he was seeing terrible human affliction in his small village of Padre, located in the hills in Kerala. A journalist colleague was sent to investigate the issue. But this time, because we also had the facility to test the problem, we decided to get samples of blood, soil and food. The tests were done. The analysis showed very high levels of a pesticide called endosulfan in all samples. Why, we asked. We learnt that the cashew plantation around the village was aerially sprayed with this pesticide each year, year after year. We also learnt that the last spray was done just a few days before we collected the samples.

The test result was powerful. It put information in the hands of the community. But because it was powerful, it was also contested. Indeed, the powerful pesticide industry has worked overtime to dispute, discredit and dismiss this data. It has taken 10 years for the pesticide to be banned in the country. This was the result of perseverance of local groups and villagers. But the ban was possible also because, this time, there was hard data which led to change.

This is the power of information in the true sense. Since then, the laboratory has gone ahead to test pesticides in bottled water, antibiotics in honey and most recently, junk in junk food. The acid test came when the laboratory tested pesticides in the cola majors—Coke and Pepsi—and was faced with powerful opponents. The Joint Parliamentary Committee, the fourth in independent India and the first to be set up on health-related issues, was a formidable challenge for us. The attack was on our ability to test 'complex' cola problems. The slur was that we were not competent enough: the CSE laboratory had simply got it wrong. But at the end, after substantial discussions and retesting of samples by government laboratories, the JPC concluded "that the CSE findings are correct on the presence of pesticide residues in carbonated water. The Committee appreciates the whistle blowing act of CSE in alerting the nation to an issue with major implications to food safety, policy formulation, regulatory framework and human and environmental health".

Science in public interest: Pollution Monitoring Laboratory

CSE's Pollution Monitoring Laboratory (PML) is a learning lab that was set up in 2000 with a mandate to support environmentally sound and socially relevant public policy, and to support communities in their fight against polluters. The lab is equipped with state-of-art instrumentation for testing trace organics (pesticides, antibiotics etc), heavy metals, water and air pollution monitoring to investigate issues of public health concern and respond to community requests. It is equipped with Gas Chromatograph with Mass Spectrometer (GC-MS), Gas Chromatograph (GC) with ECD, NPD, FID and other detectors, High Performance Liquid Chromatograph (HPLC), Atomic Absorption Spectrometer, UV-VIS Spectrophotometer, Mercury Analyzer, and Respirable Dust Sampler.

For more than two decades, the lab has conducted high-impact and visibility studies, including tests for *pesticide residues*, on endosulfan residues in Kerala (2001) that led to an eventual country-wide ban on the pesticide; tests on bottled water and soft drinks (2004 and 2006), which prompted country-wide tightening of standards; tests for pesticide residues in blood samples of Pubjab villagers that spurred research on the high cancer incidence in the state. Tests on ingestible toxins, including antibiotics in honey, heavy metals in cosmetics and trans-fats in junk food that catalysed regulatory action, including supporting a ban on junk foods in schools in the country. Other high impact studies include tests on soil and water contamination (in the Union Carbide India Limited, Bhopal in 2009 and 2012), on mercury from thermal power plants in Sonbhadra district, Uttar Pradesh (2012) and on water samples drawn from Sri Lanka's central highlands to isolate the cause of the epidemic of Chronic Kidney Disease of Unknown Etiology.

The answer is to think of a different model for the food business. It cannot be the one-size-fits-all design of industrial production.

This endorsement of our work has pointed to the importance of research to drive policy and practice change. There is no doubt that the CSE Pollution Monitoring Laboratory has made a huge contribution to bring issues of food safety and toxins to public knowledge in India.

Challenge of food, livelihood and nutrition

We believe the challenge is massive. We need to develop, grow in productivity and economic prosperity. But how do we do this without compromising on health and nutrition security? The CSE laboratory, through each study, has shown convincingly that the options are to find leapfrog solutions—to cut the toxin treadmill and not to first contaminate our food, our environment and poison our bodies.

It is clear that we need safe food. It is also clear that we cannot afford to hide behind small producers to say that we should not have stringent standards for quality and safety. We cannot also argue that we are a poor developing country and our imperative is to produce large quantities of food and reach it to the large (and unacceptable) number of malnourished. We cannot say this because even if we are poor and hard-pressed to produce more and reach more food to people, we cannot ignore the fact that we are eating bad food, which is making us ill. This is one of the many double burdens we carry.

Toxins in our food are the chemicals used during the growing and processing of food, which even in miniscule quantities add up to an unacceptable intake of poisons. Exposure to pesticides through our diet leads to chronic diseases. The best way is to manage the food basket—calculate how much and what we eat—to ensure that pesticide limits are set at safe levels. We have no option but to ingest a little poison to get nutrition, but how do we keep it within acceptable limits? This means setting safe pesticide standards for all kinds of food.

Then there are toxins, which should not be present in food at all. For instance, a few years ago, CSE found antibiotics in the honey sold in Indian markets. It was there because industrial honey farmers fed bees antibiotics as a growth promoter and for disease control. Ingesting antibiotics makes us resistant to drugs. CSE argued for standards for antibiotics in honey produced for the domestic market, which were set by the government. The question for us remains how to ensure that this added and necessary emphasis on food safety protects the interests of small producers. This is why we believe that we need policies to change the business of food so that it is safe and it protects livelihoods.

It is also clear that food has to be not just safe, but also nutritious. Today, the world's panic button has been pressed on the matter of food that is junk—high on empty calories and bad for health. There is more than enough evidence that bad food is directly linked to the explosion of non-communicable diseases in the world. There is enough to say that enough is enough.

The strategy for implementation

The answer is to think of a different model for the food business. It cannot be the one-size-fits-all design of industrial production. It must be based on societal objectives of nutrition, livelihood and safety first and profit later. This is what our programme on food safety will continue to work for.

While this programme will evolve to take on new challenges and respond to growing concerns of communities, the team will consolidate its work on the following initiatives:

Initiative 1: Antibiotics in food animals and risk of antibiotic resistance in humans: Across the globe, antibiotic resistance is a growing public health concern. It is characterised by increasing number of antibiotics becoming ineffective against a wider range of bacteria leading to higher rates of mortality and morbidity while treating infections. Health outcomes are becoming unpredictable and individual and public healthcare expenses are increasing. The situation in India is possibly more worrisome because of high prevalence of infectious diseases and unregulated antibiotic availability and use. Another important reason that has been recognised worldwide as a key contributing threat to this huge public health concern, is the non-therapeutic use—other than treatment and prevention of diseases—of antibiotics in industrial food animal production. Antibiotics are increasingly being used in industrial production of poultry, fish and cattle across the world for growth promotion. Indian industry is also catching up with such mass scale use to maximise commercial gains while meeting the ever-increasing demand for protein from animal sources.

India is completely unaware and ill prepared to address this public health issue. There is no policy on the use of antibiotics in food animals. There is limited recognition of the linkages between the non-therapeutic use of antibiotics in animals and the risk of antibiotic resistance in humans at the government level. The general public is largely unaware about the issue. There is no integrated multi-sectoral approach that promotes rational use of antibiotics in food animals and neither is there any national-level data on use of antibiotics and presence of antibiotic resistance in animals and humans. Guidelines for veterinarians do not focus on the issue and existing bio-security measures are non-binding. Animal feed requirements do not factor-in antibiotics and there are limited food product standards for harmful antibiotic residues. Withdrawal periods are not implemented and there is no monitoring mechanism to check disbursal of over-the-counter antibiotics for animals. Neither are there any separate labelling requirements for antibiotics for animal use. Despite this, Indian policymakers are failing to react to the urgent need for a comprehensive policy on rational use of antibiotics in industrial production of food animals.

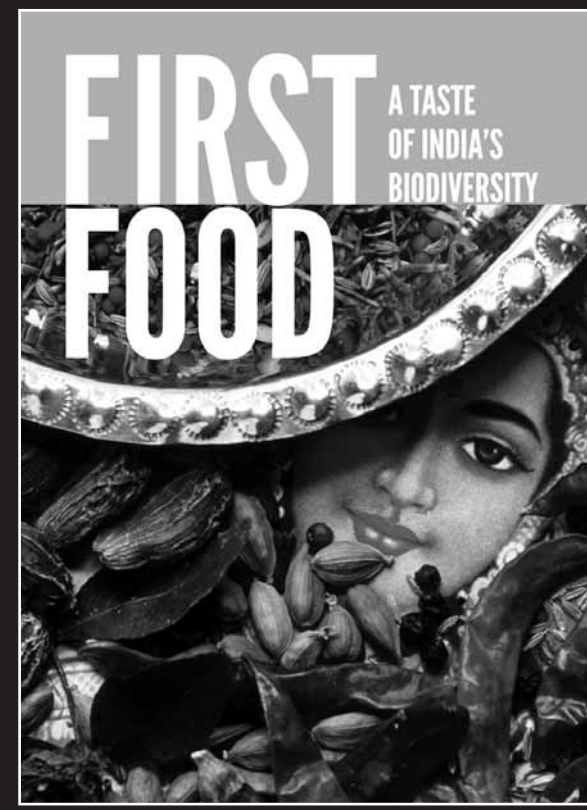
CSE's initiative for 'No antibiotic use as growth promoters in food animals' will use laboratory data and research to establish data and evidence on the use of antibiotics in food animals and advocate and influence for a national policy on 'Rational use of antibiotics in food animals'.

First Food

CSE's food campaign is also about the celebration of nutritious food that is both local and biodiverse. In 2013, CSE and Down To Earth decided to put together a compendium of recipes that originate in different regions and plants. The book, *First Food*, puts together this taste of India's biodiversity into recipes and information about food and its sources. It is an attempt to celebrate the knowledge of plants and their properties; how to best cook them to bring out their flavours and smells. This is lived and living biodiversity.

The emphasis is on appreciating the science and art of nature. If we can make nature part of our lives again, make the connection between what we eat and why we eat it, then we can also safeguard this resource for tomorrow. But if we lose the knowledge and culture of our local cuisines then we lose more than their taste and smell. We lose nature.

We want people to share our passion for food that brings back this connection—between our stomach, kitchen, health and the world around us. Otherwise, diversity in the wild will be lost. We have to remember that it cannot be protected unless we celebrate it in our lives.



One may argue that biodiversity does not need the ecosystem. It can be cultivated and can still be available to us. That is indeed possible. After all, potato originated in the far away lands of South America. It was brought to India not so long ago by the Portuguese and is now an essential part of our cuisine. We cannot imagine food without potato. Yet we miss the biodiversity of potato that gives South American food its richness and, indeed, its health. We cannot imitate nature. We cannot manufacture biodiversity.

But we can choose to live with it. We can value it in the wild and in the farm. We can savour its taste and smell. This is joy of living. This is what we must not lose. Ever.

Initiative 2: Junk foods and non-communicable diseases (NCDs): Junk foods are characterised by high amount of salt, sugar, and fat and limited and no proteins. They are energy-dense and have no more than empty calories in some cases. They are also highly processed. Worldwide, the linkages between consumption of junk foods and diet-related NCDs and obesity is established more than ever before. On one hand, greater percentage of children are now known to have NCDs and more and more evidence suggests obese children will turn into obese adults. On the other, children are vulnerable to marketing messages yet targeted most aggressively by the junk food industry through their marketing and promotional initiatives. It is in this backdrop, that public health imperatives necessitate immediate intervention in this space. While India is trying to address the issue of under-nutrition through the nationwide mid-day meal scheme, but the problem of over-nutrition, which is extending from urban to rural areas, is yet to be taken care of. The regulatory framework to safeguard the health of children is far from satisfactory.

CSE's laboratory has tested commonly available junk foods in the past and highlighted the issue of excess salt, sugar and fat along with the labeling issue. CSE has recently been part of an expert committee set up by the Food Safety and Standards Authority of India (FSSAI) as per the orders of the High Court of Delhi to set up guidelines to address this issue of excess consumption by children. In 2014-15, CSE will support the court case based on a PIL filed by a civil society organisation and build a case for the need for change.

Initiative 3: Campaign for safe pesticide use policy: The recommendations made by the JPC for safe and wise use of pesticides have not been adhered to. CSE's programme will advocate the need for reform in the regulation of pesticides; it will undertake monitoring of food and other products to understand the new pesticide compounds and chemicals that are being used in the country and build public awareness of the health risks.

Initiative 4: Continue research and advocacy on food safety measures and find ways to bring together the issues of the challenge of safe food, livelihoods of growers and food producers and nutrition for all. ■

The key outcomes

- A national level policy on 'Rational use of antibiotics in food animals' that aims to ban antibiotic use as growth promoters and helps reduce risk of development of antibiotic resistance in humans.
- Stringent regulatory policies and provisions on marketing and promotion of junk food targeted at children.
- Passage of an effective pesticide management bill that safeguards environment and human health and effective implementation of regulations for safe pesticide use.
- Initiative for stringent limits for trans-fatty acids in food; maximum level of trans-fatty acids to be brought down to 5 per cent (by weight) from the existing 10 per cent.
- Initiative for safer cosmetics to lead to finished product standards for individual heavy metals in cosmetics.
- Environmental remediation in and around the Union Carbide plant in Bhopal to remove risk of toxic contamination of the environment.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CHAPTER SEVEN

dissemination

Communication, media engagement and education

for schools and colleges ... for informed public opinion

to influence change

Change in society's behaviour, policy and practice requires information and knowledge as a driver. CSE has a track record in using knowledge for advocacy and influencing change. On the one hand, in the new age digital media world the possibilities are immense for outreach. But, on the other hand, there is a digital divide—not just because people cannot access the web, but also because information sources are limited and do not reflect realities in many parts of the world. It is also clear that there is an information overload—news today distracts, other than informs people so that they can become the agent of change. This requires new strategies for communication for change.

Our strategy for implementation

The objectives of this programme would be as follows:

- **Reposition Down To Earth as a popular and powerful voice from the South:** Build a powerful outreach of information and perspectives from the South – through web-based systems using tools for engagement like multi-media and info-graphics and social media. Make information accessible, visible and rigorous and powerful.

- **Build up a network of environment and climate change media:** Nurture engagement with print and electronic media, particularly from Africa and Asian countries, as multipliers of ideas and influence.

- **Green schools and college campus programme:** Build a network of schools, which adopt green practices like rainwater harvesting; waste management and pollution reduction. This 'practical' education allows young people to learn environment by changing practices in their schools and is a powerful game-changer.

- **Green educators network:** Bring together educators, working in colleges, to build knowledge about environmental issues, politics and solutions.

- **Gobar Times for beginners:** Materials for environmental awareness creation through a monthly publication that reaches out to general public, schools.

One, there is a need for 'smart' communication that uses multi-media and infographic materials to drive home the message in this crowded space. Two, there is a need for targeted interventions, so our research reaches important decision-makers.

In all this, we believe, media is a powerful multiplier of ideas and disseminator of information. In addition, there is a need to reach out to young minds to build awareness about environmental choices. CSE, in its work, has always believed that groups like media and schools are critical for long-term change and provide multipliers of growth of ideas and influence. Our objective would be to work with these communities at the global level as well, and aim at enhancing outreach, communication and dissemination using a variety of mediums, products and tools for ensuring maximum impact.

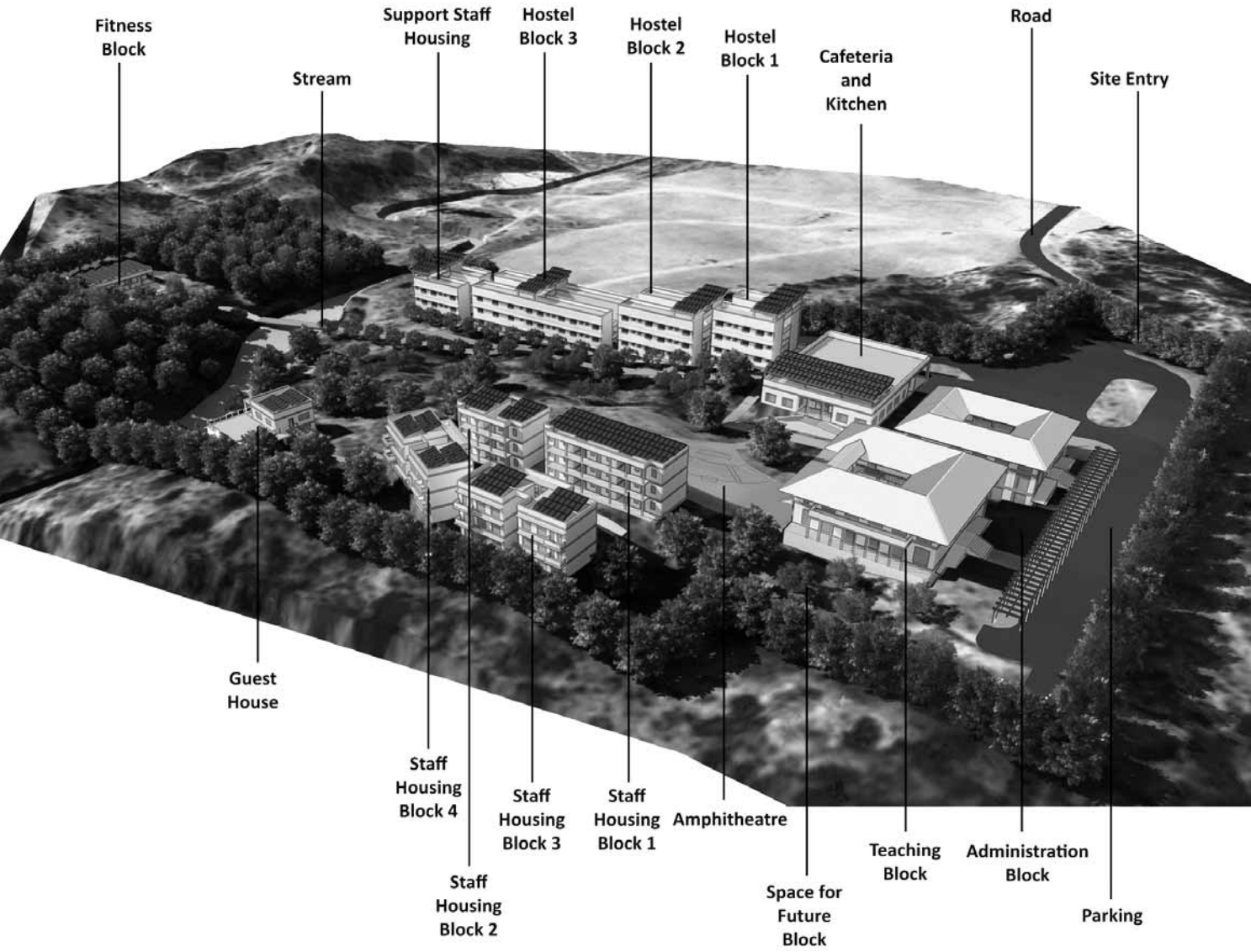
This is a crosscutting strategy as all issue-based programmes require communications to complement their work. The dissemination of results is critical for all programmes and for this, we need to strengthen outreach and build change-agents in media and schools.

Key tenets of the strategy

- Highly visible web-based information source, measured in terms of visitors and engagement through social media
- Targeted information for priority audience of policy makers through publication of highly credible and researched best practices database
- Comprehensive information source on global policies by inviting contributions from academics, researchers and policy makers on specific issues
- Network of environment and climate media professionals, who are outreached through briefing workshops by experts; trained in science and development reportage and provided fellowships for in-depth and investigative reporting.
- Network of green schools so that there is cross-learning from different societies on imperatives and collaboration between young people on best practices.
- Network of green educators so that there is a platform for building education tools for environmental learning.

The key outcomes

- A strong network of well-informed and active communicators, writers and mediapeople who can drive change through their work; annual meetings of media professionals on environment and climate change.
- Reposition Down To Earth as a popular and powerful voice from the South.
- Build a network of schools, which adopt green practices; actively disseminate environment education material.


Fitness Block
Stream
Support Staff Housing
Hostel Block 3
Hostel Block 2
Hostel Block 1
Cafeteria and Kitchen
Road
Site Entry
Guest House
Staff Housing Block 4
Staff Housing Block 2
Staff Housing Block 3
Staff Housing Block 1
Amphitheatre
Space for Future Block
Teaching Block
Administration Block
Parking

CHAPTER EIGHT

training

Our training initiatives are geared to augment skills and capacities of stakeholders to support more inclusive, accountable and environmentally sustainable development. The Centre's Anil Agarwal Environment Training Institute (model on facing page), being built near Delhi, will carry this vision forward

Need for trained environment managers

CSE's training initiatives are geared to address the urgent need in the global South to augment skills and capacities of a broad set of stakeholders to support more inclusive, accountable and environmentally sustainable development. In a rapidly developing country like India, with its vulnerable ecology, diversified economic base, unequal economic development and multitude of polluting and other environmentally degrading sources and activities, the need for well-trained, qualified and skilled environment managers in all sections of the society cannot be overemphasised. This need remains unfulfilled in most parts of the global South, where there are few, if any, dedicated institutes imparting holistic knowledge and skill-sets to managers to help address new and emerging environment and development challenges.

Build powerful multipliers in society

Trainings are targeted to build the capacities of influential change agents in society. Of particular interest are environment regulators such as pollution control board officials, who are in the frontlines of enforcing environmental regulation and compliance, and who are typically undertrained with no structured programme to comprehensively train new recruits or provide refresher trainings to existing staff on latest regulatory approaches and pollution abatement technologies. CSE-conducted training needs assessments have routinely pointed out glaring capacity gaps that need to be urgently plugged. Likewise, municipal engineers and urban local bodies are trained in prudent environmental management as they grapple with the rapid scale up of urban infrastructure—water, solid waste, river pollution, sanitation and housing—in most parts of the developing world.

Trainings help strengthen environmental regulatory institutions—pollution control boards and other departments and agencies involved in environment and social assessments of development projects, public and private sector industry, rural and urban local bodies, and students, young development professionals and NGOs.

From 2011, CSE has conducted more than 200 training events, training about 7,400 people, of whom close to 1,300 were drawn from countries in South Asia (see portfolio of training). There is a clear institutional commitment that capacity building and education are integral to our

Our portfolio of training programmes

- Decentralised water management
- Decentralised urban waste mangement
- Urban and industrial wastewater treatment
- Training on environment and social impact assessments
- Mobility and urban air quality management
- Green buildings
- E-waste and hazardous waste management
- Solid waste management: best practices
- Best practices in resource efficiency and pollution management in industries
- Regulations and compliance assurance
- Policy, science and politics of climate change
- Training programme on environment and development challenges of the South for international students
- Training of environment educators
- Urban transport reforms

Green learning campus

By 2015, trainings will move to CSE's new, dedicated 11-acre 'green' campus near Delhi, which is being designed with residential facilities for 150 people, in addition to quarters for faculty and recreational areas.

The AAETI is located amidst undulating hills of the Aravali mountain range in Neemli, Rajasthan, around two hours by road from Delhi. It is being designed with the goal to demonstrate that it is possible to build among the country's 'greenest' campuses without extravagant spending, by using innovative but cost-effective technologies, minimising wastage and optimising the use of available resources. Five key areas have been identified to meet green campus goals include site planning, material selection and construction, energy use, water management and waste management.

CSE teams are working in close collaboration with sector specialists and consultants to establish campus performance parameters and targets which will be actively monitored during construction, and once the facilities are operational.

- Site planning that will maintain natural slopes and drainage patterns
- Optimum orientation of buildings and openings to maximise light and ventilation for thermal comfort
- Use of ecological materials and construction technologies: rammed earth and fly ash bricks for walls, bamboo for the roofs.
- Solar energy will meet a major portion of the energy requirements of the campus
- Low energy consuming lights, fans, and equipment will be used, along with passive/low-energy cooling and heating systems such as stack ventilation and misting. Use of air-conditioning will be restricted.
- The campus is planned for optimal rainwater management. All rainwater on campus is channeled to recharge the groundwater or stored for future use using a network of swales, channels, recharge pits and storage tanks. A Water Innovation and Information Centre is being planned to spread water literacy.
- Wastewater treatment using natural decentralised systems, and the treated water reused for irrigation and toilets.
- Landscaping is planned using hardy, native and environmentally appropriate species to minimise the need for irrigation. A part of the land will be used for organic farming to partly meet needs of the campus.
- Food and organic waste will be composted, while inorganic waste will be segregated and recycled.

mandate to promote wise environmental decision-making and sustainable practices. CSE's capacity building programmes draw upon decades-long experience of various CSE research and advocacy programmes. These also provide access and linkages with a variety of stakeholders, including regulators, academics, grassroots activists, media, NGOs, government officials, lawyers, industry leaders, among others.

Anil Agarwal Environment Training Institute

Once fully established at our upcoming facility (*see box*) some two hours from Delhi, we propose that activities at the Anil Agarwal Environment Training Institute be organised along various schools, each of which adopts a multi-pronged approach that includes action research; courses, trainings and workshops to build a cadre of skilled environmental professionals.

- **Centre of Excellence for Improved Environmental Management in the South:** Courses on environmental regulation, monitoring and compliance, EIA and SIA, pollution abatement technologies for environmental regulators, municipal bodies, NGOs, private sector consultants and industry
- **School of Water and Waste Management:** Urban water management, rainwater harvesting, rural water sustainability, and industrial water and wastewater management
- **School of Climate Change:** Science, global policies, politics and practices
- **School of Environmental Communications:** Journalism, development communication, information management and campaign communication
- **Community College:** Green jobs in RWH, wastewater, renewable energy, organic agriculture, green buildings, etc.

The key outcomes

- Improved state of environmental governance leading to implementation of sustainable development policies and practices.
- Improved institutional capacity to address climate change impacts, within the governmental and industrial sectors and in the local communities and NGOs.
- Improved organisational and management competence and capacity in various sections of the society to strike the balance between social, economic and environmental needs.

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