



Centre for Science
and Environment



Strengthen institutions, reform laws and streamline processes

Agenda for improving
environmental
governance in India

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Preface

The Centre for Science and Environment (CSE) has been actively engaged with issues of strengthening regulations and institutions to realize the vision of a more sustainable future where concerns of environment, community and the economy are balanced.

This report is based on CSE's past work and current engagement with such issues. Our findings and recommendations are based on review and analysis of various environmental regulations, statistics of statutory clearances and authorisations granted by the central and respective state authorities, review of compliance of various laws and their monitoring status, and our interactions with various stakeholders.

In India, environmental degradation is 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 getting worse and toxins have deleterious effect on human health, particularly that of the poorest. In addition, climate change is now threatening lives and livelihoods.

One of the main factors behind the worsening environmental quality is that our laws and regulation and the institutions implementing them have failed to keep pace with the rapidly growing environmental challenges.

Our assessment shows that major reforms are required in our laws and regulation. It also shows that these reforms will be of no use if we do not strengthen our regulatory institutions and make them more transparent and accountable. We, therefore, believe that any reform of regulations must accompany reform of institutions and institutional processes.

In this report, we have come up with broad recommendations with an objective to start discussions on these issues within the country. We believe that we need a comprehensive reform agenda that is well thought out. A hurried and piecemeal approach will harm the objective of environmental protection in the country.

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The State of Environment and Environmental Governance

STATUS OF ENVIRONMENT

The need for reforming the present regulatory regime has been felt for years. The need stems from the fact that despite having a plethora of legislations and regulatory authorities, our pollution burden continues to increase, exploitation of natural resources have multiplied, and people's participation in environmental decision making has remained inadequate.

Water pollution

- Most of our rivers are highly exploited and polluted. A study by the Central Pollution Control Board (CPCB) conducted in 2011, has identified 150 polluted river stretches in the country. These stretches overlap with cities, industrial centres and intensive farming practices. This indicates that our current regulatory regime has failed to control water pollution from cities, industries and farmland.
- Groundwater pollution is also a major concern. Groundwater in 122 districts are affected by salinity, in 66 districts by chloride, in 224 districts by fluoride, in 35 districts by arsenic and in 368 districts by nitrate.
- Section 17 (1b) of the Water Act 1974 directs State Pollution Control Boards (SPCB) "to plan a comprehensive programme for the prevention, control or abatement of pollution of streams and wells in the state and to secure the execution thereof". No SPCB has yet developed a comprehensive plan to clean one stream.

Air Pollution

- Data provided by CPCB under the Nation Air Quality Monitoring Program (NAMP) shows that, out of the 215 cities covered by the NAMP, 95 were identified as non-attainment cities with respect to ambient air quality standards. Percentage of cities with PM10 (particulate matter with diameter of 10 microns or less) above permissible limit was 62 per cent.
- According to World Health Organisation (WHO), more than 20 cities in the country with population over a million, which include the large metropolises - Delhi, Mumbai, Chennai, and Kolkata- are among the world's most polluted. A study released recently in 2014 by the WHO of 1,600 cities across the world, showed that New Delhi has the world's dirtiest air. The annual average concentration of fine particulate matter with diameter 2.5 microns (PM2.5) or less, is 153 micrograms per cubic metre (ug/m3) in Delhi. This is nearly four times the annual average of National Air Quality Standard of PM2.5 specified as 40 ug/m3.

Municipal solid waste

- We have no system of treating our municipal wastes. The present management system is a system of collection and dumping, leading to widespread pollution and disease. Of the total municipal solid waste generated in India, about 70 per cent is collected and dumped in an unsanitary manner. Nearly 90 per cent of the total municipal solid waste generated remains untreated.

Environmental degradation today is a runaway problem impinging on public health and exacerbating poverty. On top of it, climate change is now posing additional challenge threatening lives and livelihoods

The entire regulatory framework in India is effectively geared towards giving multiple clearances, consents and authorizations with poor assessment and monitoring of environmental and social conditions

We face major challenges in managing our forests, riverine ecology and coastal areas. Unregulated mining – from sand to Uranium – has created havoc across the country. As far as industrial pollution is concerned, we do not know the status of compliance simply because there is no nation-wide data on this. In addition, there is no standard definition of compliance in the country. So different pollution control boards have a different yardstick to judge compliance.

THE REGULATORY FRAMEWORK

The entire regulatory framework in India is effectively geared towards giving multiple clearances, consents and authorizations with poor monitoring and enforcement.

State Pollution Control Boards

- They give Consent to Establish and Consent to Operate under the Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act 1981. India is a unique country in the world where Consent to Operate (and some authorisations) is given annually for a certain category of industries.
- They also give authorisations/ permits for various rules and notifications under the Environmental Protection Act, 1986 – *The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, The Bio-Medical Waste (Management and Handling) Rules, 1998, Municipal Solid Wastes (Management and Handling) Rules, 2000, The Batteries (Management and Handling) Rules, 2001, The Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, Plastic Waste (Management and Handling) Rules, 2011, E-waste Management and Handling Rules, 2011 etc.*
- The pressure and workload of granting these consents and authorisations are so high that most SPCBs have little time and resources to do other important work such as planning, executing, assistance, monitoring, enforcement etc. In fact, “deemed consent” has become a norm in many states.

Consents and authorisations are a major source of income for the SPCBs and there is a huge resistance to reform the Consent/ Authorisation processes because of this. A sustainable financial model for SPCBs must be an integral part of the reform agenda.

Ministry of Environment, Forests and Climate change (MoEF&CC)

- Clearance under the Environmental Impact Assessment (EIA) Notification, 2006:
 - Big projects are appraised by an Expert Appraisal Committee (EAC) and cleared by the MoEF&CC. Small projects are handled by the State-level Expert Appraisal Committees (SEACs) and State-level Environment Impact Assessment Authorities (SEIAAs). The quality of most EIA reports is questionable. The regulators – EAC, SEAC or SEIAA – are not accountable to anyone. The entire process of clearances is just a lot of paperwork.
 - Environment clearance is the only platform where people are consulted and a formal public hearing is conducted. Over the past few years, this process has been systematically diluted and public hearings are routinely manipulated excluding people from the process.

- Forest land diversion under Section 2 of the Forest (Conservation) Act, 1980:
 - There is a Forest Advisory Committee (FAC) which appraises the projects and recommends diversions. Unlike environment clearance, there is no impact assessment report required for diverting forest land. The report on the basis of which forestland is diverted reads like a botanical report – number of trees, girth of trees, types of trees, etc. There is no assessment of the impact the forest diversion on the ecology, water resources or the people living in the area. Worse, none of the reports are made available in the public domain.
- Coastal clearance under the Coastal Regulation Zone (CRZ) Notification, 2011:
 - Under this, there are State Coastal Zone Management Authorities (SCZMAs) and the National Coastal Zone Management Authority (NCZMA). SCZMAs are supposed to map the coastal zone of the states and develop integrated coastal zone management plans. Based on these, they have to recommend clearances for coastal projects to SEIAs or the MoEF&CC as the case may be. But very few states have mapped their coastal zones and developed integrated coastal management plans.
 - As in the case of environment clearance, there is a conflict of interest in preparing the EIA report and demarcating the coastal areas for CRZ clearance. The project proponent pays to the consultant to do all these. Although preserving the livelihood of the coastal community is one of the main objectives of the CRZ Notification, the law does very little in this regard.
- Wildlife clearance under the Wildlife Protection Act, 1972:
 - Permission is required for taking up non-forestry activities in wildlife habitats and within 10 kilometers from the boundaries of national parks and wildlife sanctuaries. The State Boards for Wildlife (chaired by respective Chief Ministers) and the National Board for Wildlife (chaired by the Prime Minister) are involved in giving these clearances. Here also, most projects are accorded clearances.

Apart from the above, there are area specific clearances like those under the various Environment Protection Authority for Eco-sensitive Zones etc.

Multiplicity of clearances and permits and multiple authorities conferring them has made the environmental governance framework a sanctioning platform

STATUS OF CLEARANCES, CONSENTS AND AUTHORISATIONS

Clearances, Consents and Authorisations are hardly denied to projects. Most projects coming in and around areas with highest protection status like Wildlife Sanctuaries and National Parks are also accorded clearances. Instead of strengthening the mechanisms and institutions for thorough assessment of environmental and social conditions before a project is commissioned, or monitoring of conditions once projects are in place, the process of granting clearances/permits has become an end in itself.

Environmental Clearance

- Nearly 100 per cent of the projects are given environment clearance. Very few projects get rejected on environmental grounds. Since the inception of the 11th Five Year Plan in 2007, large number of projects for every major development sector has been cleared, much exceeding the required capacity. For example between April 2007 till August 2014, thermal power

projects of more than 254,000 megawatt (MW) capacity have been cleared, which is much beyond the estimated capacity of 130,000 MW required till 2022 as per the Planning Commission. The status is same in almost every sector.

Forest Clearance

- Ninety four per cent of proposals seeking forest clearance are approved. With such low rejection rate, over the last seven years, about 270,000 hectare (ha) of forestland has been diverted, combining in-principle and final clearances. This is more than the core area of three prominent tiger reserves in India—Corbett, Kanha and Ranthambore. The rate of forestland diversion has more than doubled since the beginning of the 11th Five Year Plan as compared to 1980-2007 period.
- Compliance of clearance conditions as stipulated in the clearance letters is a major challenge for forest clearance. There is a clear lack of intention and capacity for complying with such conditions on part of the project proponent and the state officials. Data analyzed by CSE shows that majority of projects are not inspected post-clearance. Of the projects that are inspected, a large majority is found to be non-compliant.
- Compensatory afforestation scheme is also not working. For the period of 2006-2012, against the compensatory afforestation target of 1,03,382 ha, afforestation was done only on 7,280.84 ha, merely seven per cent. The scheme is also leading to serious land alienation issues. People are now being displaced from their lands for compensatory afforestation.
- Strengthening the implementation of Forest Rights Act, 2006, is another matter requiring urgent attention. Even after eight years of its commencement, issues involving settlement of rights of forest dwelling communities has been a highly contested matter for many prominent projects. Problems exist with the convening of “Gram Sabha” without proper representation, harassment and forceful eviction of forest dwellers without settlement of their forest rights, rejection of claims, and inadequate knowledge of the state authorities about the provisions of the Act etc. There are major ambiguities regarding the settlement of community forest rights as well; most states are not settling community rights.

Effectively zero rejection for all projects seeking clearances, has reduced the current process to a massive paperwork with little environmental improvements on the ground

Coastal Regulation Zone Clearance

- Like other clearances, almost all projects are awarded Coastal Regulation Zone (CRZ) clearances. Monitoring of clearance conditions for projects in CRZ is a much bigger challenge simply because there is hardly any capacity within the existing regulatory institutions to monitor coastal issues. As very few states have mapped their coastal zones and developed integrated coastal management plans, projects are being given clearances based on maps prepared by authorized agencies. However, so far these authorized agencies have not developed a uniform protocol for demarcating the coastal zones.

Consents and Authorisations by State Pollution Control Boards

- There is no data on rejection of consents and authorisations. However, interaction with various SPCBs indicate that hardly any project is denied these permits.

The entire regulatory system is based on self-monitoring and self-reporting with absence of a strong deterrence for non-compliance

MONITORING, COMPLIANCE AND ENFORCEMENT

The biggest problem is with monitoring and enforcement of the Consent/Clearance/Authorisation conditions. The entire system is based on self-monitoring and self-reporting as regulatory agencies have little capacity to do proper monitoring. On top of it, there is no deterrence for non-compliance.

Environment Clearance

- The environmental clearance letters contain a lengthy set of conditions that are to be met once projects are cleared. There are two problems with this system:
 - A large number of conditions are subjective and can't be evaluated for compliance. In fact, many conditions have nothing to do with environmental performance of the project.
 - The bigger problem is that these conditions are set with full knowledge that the MoEF&CC and its regional offices have little capacity to monitor whether developers are complying with these conditions or not.
- The six regional offices of MoEF&CC are supposed to monitor thousands of projects every year; they hardly monitor even one hundred projects. The entire compliance system is based on periodic submission of compliance reports by the project proponents. But MoEF&CC don't have manpower to even check these compliance reports. The incorrect or false information given in environmental impact assessment reports or the compliance reports often go unverified and offenders typically are never penalized. Worst still, these self-compliance reports are not put in the public domain.
- As far as projects cleared by SEAC/SEIAA at the state-level are concerned, there is no clarity on the monitoring authority, as this has not been specified under the Environmental Impact Assessment (EIA) Notification, 2006.

Central and State Pollution Control Boards

- Most SPCBs have poor inspection and monitoring capacity. On an average, nation-wide annually only about one effluent sample is tested per grossly water pollution factory to judge the status of compliance with water pollution norms. The monitoring of air pollution is even worse. It is estimated that air quality monitoring is done for only about 25 per cent of the grossly air polluting factories every year; the remaining submit self-monitored data. The status of waste monitoring is dismal – less than one per cent of hazardous waste samples are tested by SPCBs.
- The fact is that the entire system is based on self-monitored data wherein industries submit effluent, air quality and waste data monitored by a private “accredited” laboratory periodically. But under the present legal dispensation mechanism there is no deterrence for perjury and the self-monitored data cannot be used for enforcement.
- The environmental laws of India are criminal laws. It means if an industry is non-complying, either the Boards can issue a show-cause notice/closure notice or take the non-complying unit to the court for penal provision including imprisonment. Record of the past 40 years shows that the criminal nature of the law has not been a deterrence for non-compliance.

- There is also no economic deterrence for non-compliance as the cost of compliance exceeds the cost of defiance. The maximum penalty prescribed under the Water (Prevention and Control of Pollution) Cess Act, 1977 for violations is only Rs. 10,000. The maximum penalty under the Environment (Protection) Act, 1986 is Rs. 1,00,000.
- There is also no incentive to comply with the law. There is also no initiative for compliance assistance to support small and medium-sized enterprises (SMEs) to meet environmental standards.

INSTITUTIONAL CAPACITY AND CHALLENGES

The poor capacity of our regulatory institutions is one of the key reasons why we have failed to realise the intent of most Acts, Rules and Notifications.

Central and State Pollution Control Boards

- Most of the SPCBs, the country's largest environment regulators, suffer from huge deficit in terms of man-power, infrastructure and competence. They also have huge problem of transparency, accountability and corruption. These issues are well recognized within the SPCBs themselves. A report published by the Madhya Pradesh PCB on institutional capacity building highlights the fact that, "Madhya Pradesh PCB faces constraints in enforcement due to organizational weaknesses, which include high corruption, inefficient manpower and lack of adequate systems."
- The situation is only a little better at the CPCB. The CPCB has been operating without a full-time chairperson for the past few years and vacancy is being filled by ad-hoc posts.
- A large majority of SPCBs have not yet undertaken any institutional assessment and strengthening programme. In 1986-87, SPCBs were responsible for implementing three Acts and three Rules. This number has increased to four Acts and 24 Rules. But during this period the institutional design of most SPCBs have remained the same. They have been given responsibility to manage biological wastes in water to toxics in electronics and microbiological hazards in biomedical wastes, but no effort has been made to build their competence and infrastructure. The state of affairs can be gauged by the fact that Bihar SPCB entry-level salary is still Rs. 2500. This is below the minimum wages. Uttar Pradesh SPCB cannot hire environmental science or IT professionals, as it is not included in their service rules. Besides no SPCB has a position for an economist, a biologist, an ecologist, a statistician or a public relation officer.
- All SPCBs face huge manpower crunch. This can be gauged by the fact that a technical officer in the Maharashtra PCB is responsible for monitoring more than 250 factories, while in Gujarat and Karnataka PCB, a technical officer looks after 200 factories.
- Even where posts have been sanctioned, no recruitments have taken place. The vacancy is 60 per cent in SPCBs of Bihar, Karnataka and Meghalaya. It is 50 per cent in Kerala, Punjab and Goa and 30 per cent in Andhra Pradesh, Haryana and Orissa.

Most regulatory institutions suffer from huge deficit of man-power, infrastructure and competence. They also have poor transparency and accountability

MoEF&CC has outsourced all clearances without having a mechanism to ensure accountability

- While SPCBs have not hired people, they have also not upgraded their systems. Most of the boards still collect, analyse and present the data on consent management, compliance and enforcement manually. Some of the boards do not even have the resources or expertise to collect and present data; only a few have computerised systems to store information. Few SPCBs like the Andhra Pradesh PCB, Gujarat PCB, Maharashtra PCB and West Bengal PCB have implemented online systems for storing and maintaining information and for receiving consent applications electronically. However, these systems are not standardised; each Board has developed a data management system which is completely independent of the others. As a result, there are issues of compatibility. Currently, there is no centralised database in the country which compiles data on consent or compliance status.
- There is no standard definition, guideline or manual for what constitutes compliance and enforcement in the country. For instance, different SPCBs have different interpretations of what constitutes a proper compliance inspection and how frequently should it be conducted. The fact is that statutes/regulations are notified by the Central Government without comprehensive guidance on how to implement them. The SPCBs, therefore, interpret statutes/regulations and design implementation guidance as they see fit.
- In general, most SPCBs are grappling with financial crisis. The major source of income for SPCBs is consent fees and water cess. In this system, highly industrialised states are able to generate sufficient revenue, whereas less industrialised states depend on the support from the state and the central government to survive. In the present system, it is a disincentive for the pollution control boards to demand reduction in water consumption (and wastewater discharge) or refuse consent to an industry.
- There are huge issues of transparency and accountability at SPCBs. Most data is not put in the public domain. For instance, data and decisions on monitoring, compliance and enforcement for industries is not put in the public domain. In addition, most decisions are taken in a non-transparent manner (for instance bank guarantee scheme was implemented without guidelines). There is a dire need to improve systems and procedures for transparency, public participation and accountability at the pollution control boards.

Ministry of Environment, Forests and Climate Change

- For all clearances – environment, forests, coastal, wildlife etc. – MoEF&CC has outsourced assessment, but without incorporating any mechanism to ensure accountability. The EAC, the FAC, the SEACs and the SEIAAs are all manned (literally) by people who are either retired or are doing some other job. The MoEF&CC and its agencies have no capacity to do assessment internally. This is the main reason for poor assessment and decisions on clearances.

An agenda for reform

Given the complexity of issues, a reform exercise to ensure better environmental governance in India requires a multifaceted approach focusing on revising and synergizing the various laws, streamlining regulatory processes and strengthening our regulatory institutions. The main purpose of such revision is developing an integrated system which is robust, transparent, participatory and accountable.

REFORM LAWS

- Strong laws and regulations are important to address environmental problems. But multiple laws with overlapping regulatory provisions make implementation complex and lax. Such is the case with our umbrella legislations- Environment (Protection) Act, Water (Prevention and Control of Pollution Act), the Air (Prevention and Control of Pollution Act). As Water Act and Air Act deal with media-specific pollution issues, they can be subsumed as Rules under the Environment (Protection) Act. This will remove multiplicity in clearances/consents as well as in monitoring and enforcement.
- Regulatory agencies for the past four decades have failed to use the criminal penal provisions appropriately due to various justifiable and unjustifiable reasons. The criminal nature of our laws, thus, has not been a sufficient deterrence for non-compliance. We, therefore, need to decriminalize Environment (Protection) Act and make it part-civil and part-criminal.
- The current financial penalty provided under the Environment (Protection) Act need to be suitably amended. It should be commensurate with the extent of damage caused to the environment as well as the community. Penalties must be measured by the amount saved by the industry in not installing proper environmental pollution control devices and/ or it being non-operational. Penalty should also be linked to the extent of profit.
- There is a need to setup a transparent and accountable system and then give power to the regulatory agencies to issue legally enforceable administrative orders to resolve a violation without going to the courts for relief. Administrative orders based on the evidence of the violation, are legally enforceable and afford the violator due process and an opportunity to be heard. Under an administrative order, the violator will be required to take corrective actions within a prescribed time period, penalties may be assessed, and supplementary enforcement projects may be established.
- Law must be changed to enable the use of self-monitoring, self-reported data for enforcement action. Perjury should be made the biggest offence where misrepresentation of information or flawed reporting is observed.
- Instead of just a command and control approach to execute laws, multiple regulatory tools must be employed for their effective implementation.
- The Environment Statement submitted by companies under section 14 of the Environmental (Protection) Rules, 1986, should be made part of the Annual

Major reforms are required in laws and regulations; but these reforms will not work if we do not reform our regulatory institution and their processes

Financial Reports of the companies. Companies must disclose plant-wise environment statement in the Annual Financial Reports. Similarly, regulatory agencies must disclose the names of grossly polluting plants and non-complying plants to the public. They should also publicise the enforcement actions taken against plants.

- Insitute a system of polluters pay principle (for example, environmental cess) to incentivize industries to move towards cleaner and greener technologies and practices.
- Pollution standards must be revised based on Best Available Technology in each sector. Instead of concentration-based standards, load-based and ecosystem-specific standards should be specified.
- The focus of the regulatory system must move towards area and ecosystem based environmental planning and management. In this regard, rules must be framed for:
 - Undertaking Strategic Environment Assessment for major government policies and programmes (such as policies for industrial corridors, manufacturing zones, Special Economic Zone etc.).
 - Undertaking Regional Environmental Impact Assessment for developing master plans for cities, industrial hubs etc.
 - Carrying capacity studies for developing zoning plans at the district level.
- Develop standard operating procedure for inspection, monitoring and enforcement for existing laws and regulations. A uniform definition of compliance should be developed to avoid varied interpretations by various state pollution control boards that creates a challenge for monitoring of environmental conditions.
- All new laws, rules, notifications and standards must be accompanied by a Standard Operating Procedure for monitoring, compliance and enforcement. This should be made a legal requirement.

STREAMLINE PROCESSES

- The multiplicity in the system, both in various regulatory provisions and the functioning of administrative authorities needs to be streamlined. Multiplicity in the clearance/permitting process is a major problem that leads to poor-decision making and also sustains unscrupulous activities.
- A holistic and an effective system that integrates Consent To Establish/ Authorisation to Establish, and the environment, forest and coastal clearances is required. The clearance should be given based on one holistic impact assessment report.
- Wildlife clearance should remain separate and the current process should be further strengthened.
- There should be one consent/clearance agency at the state and the centre level.

- The consent/clearance agency should clearly outline the performance indicators, and monitoring and compliance conditions.
- Public participation should be incorporated into multiple stages of this clearance process including (but not limited to):
 - Public comment and consultation at the scoping stage (while awarding Terms of Reference)
 - Public consultation report prepared while preparing the Impact Assessment Report
 - Public hearing to discuss the draft Impact Assessment Report and Public Consultation Report
 - Opportunity for the affected community to present its opinion to the appraisal/assessment committee.
 - Decisions taken at the hearing to be an integral part of the assessment and clearance process.
- All the documents based on which clearance has been granted/ rejected must be put in public domain.
- The capacity of the regulatory agencies must be enhanced to do internal assessment before the project is reviewed by the expert committee.
- Expert committee should function as a recommending body, and not as an appraisal body. It should comprise of technical experts and its deliberations should be recorded including the dissent of members.
- An assessment and clearance fees should be charged by the regulatory bodies to fund the clearance process.
- Accredited consultants should prepare the impact assessment report. MoEF&CC should notify an accreditation scheme with strict accountability provision; perjury should be made the biggest offence.
- Over a period of time we must devolve all clearances to the state level. For this we must start building capacity and accountability in the state agencies.
- Similarly, over time low impact individual projects like buildings, restaurants, malls etc. within municipal limits should be cleared at the municipal level. New processes must be institutionalized and capacity of municipalities enhanced so that this can be done.
- The Consent to Operate given at the state-level periodically should be replaced with a periodic environmental audit process (annual audit for highly polluting and environmentally damaging projects). This is separate from the periodic inspection and monitoring that the regulatory agencies must do as per the clearance conditions.

STRENGTHEN INSTITUTIONS

- The reform of laws and streamlining of processes can only be effectively realized if the institutions concerned with implementation have adequate competence, resources and infrastructure. The lack of capacity in the central and state pollution control boards and in various other agencies in planning, evaluation, monitoring and enforcement is a major factor for poor state of the environment in the country. There is a clear need to address this through institutional assessment process, revision of appointment criteria, increasing resources, building infrastructure and institutionalizing systems for transparency and accountability.
- We must develop a 2-5 year institutional strengthening plan for the regulatory institutions taking into account new areas of intervention and needs of a professional institution. This should be done both at the national, state and at the local levels.
- For making the regulatory institutions financially self-sufficient, a system of annual compliance fees must be institutionalized. This should replace the consent/authorization fees and water cess charged by the SPCBs.
- The resources collected from the environmental cess should come to MoEF&CC and redistributed to the CPCB and the SPCBs. A portion of the environmental cess should be used for developing and implementing nation-level plans and programmes.
- We must institutionalize best practices for public accountability at different levels in regulatory agencies. Regulatory bodies must be made accountable for achieving environment goals. This means that all environment data, consent, monitoring and enforcement data/decisions should be made public.

ENHANCE PUBLIC PARTICIPATION

- Public support and involvement is essential for improving the status of environment of the country. We must involve the people in regulatory processes and procedure.
- Information disclosure is the key to increase public participation. People must be informed about the status of the environment and what is leading to poor environmental quality. They must be informed about the status of compliance of industrial units in their locality and surrounding area. They must be encouraged to become the eyes and ears of the regulatory agencies.
- Use of social media can play a major role in involving the public in environmental governance.

Annexure I

State Pollution Control Boards and Laws Implemented by Them**STATUS OF IMPLEMENTATION OF THE MAJOR POLLUTION CONTROL LAWS****Water (Prevention and Control of Pollution Act), 1974**

- The Water (Prevention and Control of Pollution Act), 1974, a “sector specific” legislation concerns the “prevention, control and abatement” of water pollution, and “restoring the wholesomeness” of water in India. Section 17 of the Act specifies the functions of State Pollution Control Boards (SPCB) for executing the preamble of the Act by the way of developing a “comprehensive programme” to manage water pollution, and monitor the discharge of effluents in the water bodies. However information on water pollution and status of waste water generation and treatment across the country clearly shows that the SPCBs have failed to even implement the preamble of the act.
- A study by the Central Pollution Control Board (CPCB) conducted in 2011, has identified 150 polluted river stretches in the country. High levels of BOD in the rivers reflect the pollution situation. Out of 150 polluted river stretches monitored, 23 per cent were found to have BOD levels higher than 30 milligrams per litre (mg/l), 10 per cent have between 20-30 mg/l, 17 per cent between 10-20 mg/l, 25 per cent between 6-10 mg/l and 24 per cent between 3-6 mg/l¹.
- Groundwater pollution remains another concern. CPCB has installed 490 groundwater quality monitoring stations across various districts in the country. Data from these stations show that ground water in 122 districts is affected by high salinity, in 66 districts by chloride, in 224 districts by fluoride, in 35 districts by arsenic and in 368 districts by nitrate².
- The status of treatment of municipal waste water particularly in the urban centres of India with populations more than 50,000 is another major issue³. According to CPCB estimates, on an average around 38,000 million litres of waste water is generated in these centres on a daily basis. The municipal wastewater treatment capacity developed so far in India can treat about 11,000 million litres per day, accounting for only 29 per cent of wastewater generated in these urban centres. Therefore there is high discrepancy in the amount of waste water generation and treatment capacity that needs urgent attention.

Air (Prevention and Control of Pollution Act), 1981

- The Air (Prevention and Control of Pollution Act), 1981, a “sector specific” legislation, concerns the “prevention, control and abatement” of air pollution in India. Section 16 of the Act specifies that the CPCB is to plan a nationwide program in lines with the preamble of the Act. Section 17 of the Act outlines the role of the SPCBs for executing the core mission of the legislation by developing a “comprehensive programme” to manage air pollution, and by appropriate monitoring and inspection. Despite the mandates and nearly three decades into the enactment of the Act, the status of air pollution in Indian cities remain alarming.
- According to World Health Organisation (WHO), more than 20 cities in the

country with population over a million, which evidently include the large metropolises - Delhi, Mumbai, Chennai, and Kolkata- are among the world's most polluted.

- The problem is particularly notorious with respect to particulate pollution. A study released recently in 2014 by the WHO based on 1,600 cities across the world, showed that New Delhi has the world's dirtiest air. The annual average concentration of fine particulate matter -with diameter 2.5 microns (PM_{2.5})- in Delhi is 153 micrograms per cubic metre (ug/m³). This is nearly four times the annual average of National Air Quality Standard of PM_{2.5} specified as 40 ug/m³.
- Data provided by CPCB under the Nation Air Quality Monitoring Program (NAMP) shows that, out of the 215 cities covered by the NAMP, 95 falls in the non-attainment category with respect to ambient air quality standards. Percentage of cities with PM₁₀ above permissible limit was observed to be 62 per cent, while that for NO_x remained nine per cent.
- Of the total air pollution load nationwide, vehicular sources contribute to 64 per cent, thermal power plants to 16 per cent, industries to 13 per cent, and the domestic sector has nearly seven percent contribution. The growing energy demand in the country, the primarily source of which currently remains coal (60 per cent) with high fly ash content, is another major source of air pollution⁴.
- Despite such alarming situation, none of the Pollution Control Boards have come with up comprehensive plans for addressing the pollution control and prevention issues, and working towards the overall improvement of air quality.

STATUS OF IMPLEMENTATION OF THE VARIOUS RULES

Municipal Solid Wastes (Management and Handling) Rules, 2000

- The Municipal Solid Wastes (Management and Handling) Rules (MSW Rules), 2000, concerns the collection, segregation, storage, transportation, processing and disposal of municipal solid wastes in India. Every municipal authority responsible for any of these activities is liable to the provisions of the Rules.
- The Rules (Rule 6) require the State Pollution Control Boards (or the Pollution Control Committees) to monitor compliance of standards by waste processing and disposal facilities with respect to ground water, ambient air, leachate quality etc.
- For municipal authorities⁵, the Rules (Rule 4) specify that they are responsible for the collection, storage, segregation, transportation, processing and disposal of municipal solid wastes, within their jurisdictions. The municipal authorities are required to do so by setting up of waste processing and disposal facilities, monitoring their performance, improving existing landfill sites as required and identifying future landfill sites for future use and developing them suitably.
- However the status of management of MSW remains far from what the law intends. A CPCB evaluation of the status of municipal solid waste for the year 2010-2011 for the entire country showed that, of the total municipal

Table 1: Status of municipal solid waste management in India

	Tonne per day (2010-11)	Percentage (%)
Total waste generated	127,486	100
Total waste collected	89,334	70
Total waste treated (Composting, Waste to Energy, Refused derived fuel etc.)	15,881	12
Total waste untreated	111,605	88

Source: CSE analysis based on data derived from CPCB's report (2011-12) – Status report on municipal solid waste management

solid waste generated, about 70 per cent is collected⁶. However the bigger problem is with treatment. Nearly 88 per cent of the total municipal solid waste generated remains untreated. (See table 1: Status of municipal solid waste management in India)

- The municipal authorities (which also include Urban Local Bodies) are required to seek authorization from the respective SPCBs or Pollution Control Committees (PCC) for setting up waste processing and disposal facilities including landfills. However, most of the untreated solid waste is actually being dumped in unscientific and unauthorized disposal facilities. CPCB estimates for the year 2010-2011 showed that out of a total of 4041 Urban Local Bodies (ULB) in India⁷, only eight per cent of them have been given authorization to set up such waste processing or disposal facilities⁸.
- The reporting status of the ULBs also remains unsatisfactory. The ULBs need to furnish their annual report to the District Magistrate or the Deputy Commissioner concerned in case of all towns and cities, with a copy to the SPCB/PCC. However for the year 2010-11 it was found that 69 per cent of ULBs furnished their reports to SPCB/PCC (See table 2: Status of reporting done to SPCB/PCC by ULBs and authorization granted).

Plastic Waste (Management and Handling) (Amendment) Rules, 2011

- The management of plastic wastes, as per the Plastic Waste (Management and Handling) (Amendment) Rules, 2011 (PWM Rules), rest with SPCBs/PCCs and concerned municipal authorities. The board is empowered to register and give consent to manufacturers and recyclers, whereas the collection, segregation, transportation and disposal of plastic waste rest with concerned municipal authorities.
- While the enforcement of the provisions of the ‘Rules’ lie with the SPCB,

Table 2: Status of reporting done to SPCB/PCC by ULBs and authorization granted

	Number of ULBs	Percentage (%)
Total ULB in India (as per census 2011)	4,041	100
ULBs that reported to SPCB/PCC	2,806	69
Authorization granted to ULBs	371	8

Source: CSE analysis based on data derived from Census 2011 and from CPCB's report (2011-12) – Status report on municipal solid waste management

the Rules specify the development of a State level advisory body to monitor its implementation.

- According to Centre for Science and Environment (CSE) estimates, consumption of plastic products in India is around 11.74 million tonnes annually⁹. With India's growing appetite for plastics/ plastic products, the central concern remains the disposal of plastics after their consumption cycle. The CPCB estimates that of the total plastic products consumed, 70 per cent is disposed off as waste¹⁰.
- Though recent statistics is not available regarding plastic waste management in India, CPCB report of 2011-2012, based on 2008 estimates show that, of the total plastic products consumed, which is 8 million tonnes, about 5.6 million tonnes was disposed off as waste¹¹. What is of additional concern is the poor status of waste collection. Of the total waste generated, about 60 per cent or 3.36 million tonnes is collected and the rest 40 per cent enters the uncollected waste stream.
- The CPCB report also shows that out of 5511 plastic manufacturers and recycling units in the various industrial areas, only 38 per cent of the units were granted registration.
- The poor state of collection and disposal of plastic products become more alarming as till date no technology has been validated for safe disposal of plastics¹². A few pilot tests have been conducted to reuse in road construction, co-processing in cement kilns¹³.

The Batteries (Management and Handling) Rules, 2001

- The Batteries (Management and Handling) Rules, 2001, is applicable to all manufacturers, importers, re-conditioners, assemblers, dealers, recyclers, auctioneers, consumers and bulk consumers involved in manufacturing, processing, sales, purchase and use of lead acid batteries or its components.
- The Rules framed to improve the collection and recycling of used "lead acid batteries" or its components, requires bulk consumers and auctioneers to dispose off such batteries by depositing them with the dealers, manufacturers, importers, assemblers, registered recyclers, re-conditioners or at designated collection centers¹⁴. Auctioneers are also required to auction batteries only to registered recyclers. All information concerning auctioning is to be reported to the respective SPCBs/ PCCs. Despite the Rules' mandate, there is a serious shortfall in compliance and reporting on generation, collection and recycling of the batteries/its components.
- The SPCBs maintain a roster of manufacturers, recyclers, assemblers, bulk consumer, auctioneers, recyclers and collection centers. As per the Rules, the recyclers are required to be registered with the SPCBs. However there is poor reporting regarding the recycling status of these batteries. As per CPCB estimates of 2012, and inputs from Board officials, the CPCB till date has received data from only 17 SPCBs/PCCs regarding the status of battery recycling facilities. No report has been received from other the states in spite of reminder by the central board¹⁵.
- There is no system in place, to track the collection and disposal of smaller batteries or scattered users. For example, according to Chairman of Kerala Pollution Control Board, there is no conclusive information on the

collection and disposal of inverters, largely used by small businesses, in absence of such tracking system¹⁶.

- The Rule also requires the manufacturers, importers, assemblers and re-conditioners of lead-acid batteries, to create public awareness through advertisements, publications, posters or other appropriate means. But no such dissemination of information is typically carried out.

Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008

- The Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008, concerns the management of various types of hazardous wastes including the ones that are recyclable, landfill able and incinerable.
- According CPCB estimates, till 2011 there are about 41,523 hazardous waste generating units in India generating around 7.90 million tonnes of waste annually. Of the total generation, 3.32 million tonnes is landfillable waste, 0.6 million tonnes incinerable, and the rest 3.98 million tonnes recyclable¹⁷.
- Though the number of Treatment, Storage, and Disposal Facility (TSDF) in India has increased gradually over years, from four in 2003 to 38, spreading across 16 States/Union Territories (UTs)¹⁸, it has not improved the overall situation of hazardous waste management¹⁹. Waste generated in states that do not have TSDF facilities have limited or inadequate options for disposal due to hindrances in interstate movement and required permits, perpetuating the waste management problem.
- There is a need for setting up of TSDFs in the States/UTs generating moderately high quantities of hazardous waste but not having TSDFs—such as Chhattisgarh, Jharkhand, Jammu and Kashmir, Goa, Assam, and Ponducherry.

The Bio - Medical Waste (Management and Handling) Rules, 1998

- The Bio - Medical Waste (Management and Handling) Rules, 1998, requires any facility involved in the generation, collection, reception, storage, transportation, treatment, disposal and/or any other form of handling of bio-medical waste (BMW), to seek authorization from the concerned SPCB.
- The compliance status for bio-medical waste is much better as compared to others, with more than 90 per cent of the waste being treated (*See table 3: Status of bio-medical waste management*).
- A significant portion of the bio-medical waste is managed by the mediation of private agencies. Of total 159, 838 health care facilities (HCFs) in the country in 2012, nearly 76 per cent (121, 279) utilize Common Bio-medical Waste Treatment Facilities (CBWTF) commissioned by private agencies. Nearly 14 per cent (21,870) of HCFs do on-site treatment of their bio-medical wastes²⁰.
- Around nine per cent (36 tonnes/day) of the waste still remains untreated finding its way along with municipal waste²¹.
- Around eight per cent (12,990) of HCFs violated BMW Rules and around seven percent (11,583) of defaulter HCFs were issued show-cause notices and directions by respective SPCBs²².

Table 3: Status of bio-medical waste management

State/UT	Details
Total quantity of bio-medical waste generation in tonnes/day	416
Total quantity of bio-medical waste treated in tonnes/day	380
Quantity of bio-medical waste untreated in tonnes/day	36
Total number of health care facilities	159,838*
Number of health care facilities utilizing common bio-medical waste treatment facility	121,279
Number of health care facilities having on-site treatment and disposal facilities	21,870
Number of health care facilities violated BMW Rules	12,990
Number of show-cause notices/directions issued to defaulter health care facilities	11,583

*Excluding Chhattisgarh & Kerala

Source: Central Pollution Control Board, 2012, Annual Report

Annexure II

Structural and Functional Issues of State Pollution Control Boards

COMPOSITION OF STATE POLLUTION CONTROL BOARD

- Section 3 and 4 of the Water Act provides guidelines regarding the composition of the SPCBs. Currently, among the 17 members of the SPCBs, the ownership of the Board lay with only two, the chairperson and the member secretary.
- In many cases the chairman is part-time, which effectively means the board has only one full time member. This affects the efficient functioning of the Board.
- The other members of the board are nominated from different organizations and have tenure of three years. As the Act do not require the nomination of such members on full time basis, most of them are part time and serve on the Board besides full-time engagement with their parent jobs. Due to such engagement, the members may not find sufficient time for effective contribution towards functioning of the board.
- Currently, the board members are nominated by the state (and central) government from different sectors (agriculture, fishery, industry, companies and corporation owned by central/state government). Records of board meetings from across the country shows that these members have not shown interest in their duty as required by the Board. In many of the SPCBs, even meetings are not held on a quarterly basis, as stipulated in the law.
- SPCBs also have members who are either involved with public sector units or state government investment/industrial development board, creating a conflict of interest in the functioning of the these members

RECRUITMENT ISSUES

Loosely defined qualification of chairperson

- The qualification of SPCB chairpersons as outlined under the Water Act says that the chairperson can be “a person having special knowledge or practical experience in respect of matters relating to environmental protection or a person having knowledge and experience in administering institutions dealing with the matters aforesaid”. The qualification defined in the Act is general, which can be interpreted according to the convenience of the nominating authority to accommodate any person of his choice as chairman of the Board, with our without technical understanding. There is a need to revise this.

Archaic recruitment rules

- The SPCBs are facing huge challenges when it comes to recruiting the right people. The dated recruitment rules make it difficult for the board to hire qualified people for a certain position. The problem is two fold- limited recruitment criteria and poor salary provisions.
- Recruitment rules in many boards do not have provisions for hiring IT staff or students with environmental science background, as in case of Uttar Pradesh PCB. Thus, for such positions, people are hired on a contractual

basis, often with little aptitude towards work. They also lack responsibility and vision.

- Another problem with the recruitment rules is the low salary that the board has to offer as specified in the rules, which has not been revised appropriately. For example, in Bihar SPCB, salary was fixed as Rs 2,500 per person for assistant engineer in the late eighties. This has not been changed in the last 30 years.

CAPACITY AND QUALITY OF PERSONNEL

Disparity in man-power and work-load

- Increasing industrial activities in recent years and formulation of new legislations have increased the workload of SPCBs. However the increased administrative responsibilities have not been matched by the required man-power.
- Detailed information provided by Odisha PCB officials show that, between 1996-97 and 2006-07, over 10 years, in most areas the administrative responsibilities of the Board has increased three to four times and several new responsibilities has been added. However, the technical manpower to handle such responsibilities has increased only 1.5 times, which is clearly a huge disparity (*See table 1: Increased responsibilities of Odisha Pollution Control Board not coherent with manpower*). This has led to inefficiency

Table 1: Increased responsibilities of Odisha Pollution Control Board not coherent with manpower

Functional Indicators	During 1996-97	During 2006-07	Increased responsibility in 10 years
Administrative responsibilities			
No. of industries / mines under administration requiring consent	306	1,199	4 times
No. of industries / mines under administration requiring No Objection Certificate	172	639	3.7 times
No. of miscellaneous industries (stone crusher & brick kiln)	0	1,200	Additional responsibility
No. of health care units under administration	0	774	Additional responsibility
No. of Urban Local Bodies	0	103	Additional responsibility
No. of public complaints handled	Insignificant	296	Additional responsibility
No. of public hearings / consultations	Did not exist	77	Additional responsibility
No. of inspections conducted	1,159	4,097	3.5 times
No. of stack and ambient air monitoring	711	2,590	3.6 times
No. of legal cases handled	3	72	24 times
No. of Acts and Rules notified	4 Acts and 9 Rules	4 Acts and 22 Rules	2.5 times
No. of Regional Offices	4	9	2.5 time
No. of external technical projects	0	5	5 times
Manpower and average individual workload			
Total Technical Manpower	35	55	1.5 times
Nos. of units regulated per person	13.6	71	5.2 times
Finance			
Annual budget of the Board	Rs. 298.96 lakhs	Rs. 839.12 lakhs	3 times
Amount of cess collected	Rs. 138 lakhs	Rs. 556 lakhs	4 times
Amount of consent fees collected	Rs. 29.52 lakhs	Rs. 866.03 lakhs	29 times

Source: Information provided by Odisha Pollution Control Board official

Table 2: Vacancies in various SPCBs

SPCBs/PCCs	% of vacant post as on March 19981	% of vacant post as on March 20132
Andhra Pradesh	34	43
Assam	3	0
Bihar	6	61
Goa	46	9
Gujarat	14	34
Haryana	31	23
Karnataka	65	61
Kerala	4	48
Maharashtra	17	17
Meghalaya	58	45
Mizoram	27	3
Orissa	27	2
Punjab	54	19
Rajasthan	8	22
Sikkim	0	0
Tamil Nadu	11	28

Source: 1. Evaluation study on functioning of State Pollution Control Board, Planning Commission, Government of India, 1998;

2. Geetanjoy Sahu, Environmental regulatory authorities in India: An assessment of State Pollution Control Boards, Tata Institute of Social Sciences, Mumbai 2013

and poor performance of the Board. In 1996-1997, on an average while number of units regulated per person was around 13.6, in 2006-2007, it became 71, more than five times increase in workload.

- Information provided in different reports also highlights the slackness on part of the regulatory body to hire people¹. Many SPCBs have large number of vacant posts, including instances where the situation has not changed over the last 15 years. There are more than 60 per cent vacant posts in the states of Bihar and Karnataka, while in Kerala it is nearly 50 per cent (See table 2: *Vacancies in various SPCBs*). In fact the Kerala PCB still operates with the staff strength it had in 1995, though new areas like municipal solid waste management, biomedical waste and high-rise buildings have been brought under its ambit. A committee appointed by the Supreme Court had recommended sanctioning of 20 additional posts to the Kerala PCB around six years ago, but nothing has been done so far.
- There is no existing protocol in the Board to decide how many minimum personnel they require to do respective jobs effectively. This understanding gap also is a contributing factor for the poor hiring status. Madhya Pradesh PCB has published an institutional capacity building report in 2005. The report highlights, “Madhya Pradesh PCB faces constraints in enforcement due to organizational weaknesses, which include high corruption, inefficient manpower and lack of adequate systems².”

Lack of personnel with specific skills

- The quality of staff at SPCB is an important factor that has long been disregarded. Graduates from good universities usually do not prefer SPCB as their first priority for job. Poor salary structure and growth opportunities create a big hindrance.
- The kind of escalation in infrastructural development, industrial activity, mining activity, waste management which country is envisaging, there is clearly a need to bring in competent people. Unfortunately, neither MoEF nor CPCB nor SPCB or PCC have deliberated on the right kind of incentives to develop this pool of people. If pollution control boards have to be an effective and authoritative organization, they certainly need to rethink their recruitment having people of varied skills, from scientists, engineers to statisticians, sociologists, economists, health experts, planners etc. (See table 3: Required expertise at SPCBs)

Lack of legally proficient staff

- The CPCB/SPCBs are the prosecuting authorities in case of pollution control violation, as well as the target of an increasing number of law suits for failure to enforce compliance. This necessitates the presence of substantial legal expertise within the Board, to understand such issues and deliberate on cases for prosecution in the courts. While the number of Public Interest Litigations (PIL) and judicial mandates has grown over the years, little attention has been paid to build legal capacity and training within SPCBs. In

Table 3: Required expertise at SPCBs

Expert	Responsibilities/job profile
Sociologist	Assess the socio-economics profile and changes in an area
	Assess socio-economics impacts on the local community
Environmental statistician	For enabling efficient use of statistical tools for better understanding
	Helping eliminate all possible sources of error in environmental analysis
Economist	Performing cost benefit analysis
	Bringing an economic perspective to the team of experts by analysis the proposed policy or regulation
Software engineer	Employing useful software tools to analyze the feasibility or impacts of a project
	Updating and building interactive websites
Environmental health expert	Assessing environmental health related issues of the region
Spokesperson	For clear and efficient communication by the technical team to the rest of the stakeholders
Occupational health expert	Assessing occupational health hazards by the industries
Forest manager/ranger	For addressing issues related to forest management
	Green belt development
Planner	For providing a holistic view of techno-socio political construct of the environment in the region
Experienced environmental ad	For providing legal advice to the technical board

addition, it has been increasingly difficult for SPCBs to prosecute cases due to the lack of legal knowledge and resources to collect the necessary evidence to convict polluters.

- While it is important that general and technical staff at the SPCBs get trained to better understand and deal with the underlying legal concepts for an environmental case, such as the importance of chain of custody, causation and harm, and procedural due process, the number of highly qualified legal staff at CPCB/SPCBs should also be increased or supplemented with contract attorneys.

PERFORMANCE ISSUES

Poor monitoring and management

- The SPCBs are the primary compliance, monitoring and enforcement agencies in the country. The Board is entrusted with ensuring compliance with standards through inspection and monitoring, implementation of the National Ambient Air and Water Quality Standards, conducting public hearings, awarding consent to establish and consent to operate, generating environmental awareness and imparting training to their own staff.
- Most of the SPCBs does not have capacity for compliance monitoring. With respect to water polluting industries, the frequency of monitoring is once a year, while for air polluting industries is once in four years. Compliance status is therefore dependent on self-monitored data which are not admissible in the court of law.
- Another important challenge with SPCB's are huge number of small and medium sized industries, where compliance with environmental standards is poor. Moreover there is no provision within SPCB to provide compliance assistance to small and medium-sized enterprises (SMEs) to meet environmental standards.
- Most SPCBs have poor consent management procedure. Most of the boards still collect, analyse and present the data on consent management, compliance and enforcement manually, requiring lot of paper work and making the process highly inefficient.
- Poor data management is also another issue. Some of the boards do not even have the resources or expertise to collect and present data; only a few have computerised systems to store information.
- The Andhra Pradesh PCB, Madhya Pradesh PCB and West Bengal PCB, have implemented online systems for storing and maintaining information and for receiving consent applications electronically. However, these systems are not standardized. Each board has developed a data management system which is completely independent of the others. As a result there may be issues of compatibility and comparison between and among state-level information systems. Currently, there is no centralised database in the country which compiles data on consents given or the compliance status.
- There is also no standard definition or guideline specifying what compliance and enforcement precisely means. For instance, different state boards have different interpretations of what constitutes a proper

compliance inspection and how frequently it should be conducted. The fact is that statutes/regulations are notified by the central government without comprehensive guidance on how to implement them. The SPCBs therefore interpret statutes/regulations and design implementation guidance as they see fit. There is an urgent need to develop and disseminate standard guidance manuals on different aspects of compliance and enforcement for different statutes/regulations. The CPCB should identify best practices and work with the SPCBs to develop them.

Lack of area/eco-system based planning

- The existing plans for environmental management in the country are at unit level. The policy or action does not take into account environmental management in air shed or water shed areas. Moreover industrial units are only required to follow standards that do not take into account the location/area specific environmental assimilative capacity. This is a primary reason why we progressively experience deterioration in regional air or water quality.
- Development of zonal atlas and ecosystem level plans can prevent further degradation of pollution status in an area. It will help to assess the cumulative impact of any development proposal in an area and make decisions accordingly.
- Development of load and assimilative capacity based standards instead of concentration based standards can help in better assessment and monitoring of environmental pollution.

Weak penalty provisions incentive for non-compliance

- One of the major problems with the SPCBs has been their inability to monitor and implement pollution compliance under various regulatory provisions that fall under their jurisdiction. This is largely due to poor penalty provisions. The maximum penalty prescribed under The Water (Prevention and Control of Pollution) Cess Act, 1977 for violations is only Rs. 1,000, while the same under the Water (Prevention and Control of Pollution) Act, 1974 is Rs. 10,000. The maximum penalty under the Environment (Protection) Act, 1986 is rupees one lakh.
- Weak penalty provisions give leeway to violators to continue polluting without creating any deterrence. For example, installing an effluent treatment plant (ETP) or upgrading one could be a multi million dollar investment. But if industry decides not to install or upgrade, then SPCB can fine them at the max Rs. 10,000 per day. If SPCB fines the industry continuously for one year, maximum penalty levied will be Rs. 36.5 lakhs annually. It is meager in comparison to the installation cost of ETP.
- Given the cost of compliance often exceeds the cost for defiance, a non-complying industry not only saves handsome amount by not installing pollution control devices or undertaking treatment mechanisms, it also earns huge profits out of the defiance of laws.
- Penal provisions made under the anti pollution laws thus needs to be suitably amended, commensurate with the extent of damage caused to the environment as well as the community. Penalty should also be linked to the extent of profit.

Lack of administrative enforcement authority

- Environmental laws in India are criminal laws. Under the current system, the regulators do not have the power to impose financial penalty on violators. The Boards can either issue a show-cause/closure notice, or take the non-complying unit to the court. The former is a simpler procedure but can be challenged in the court, while the latter suffers from procedural delay and also needs to provide admissible evidences. The various SPCBs admit that their preference is less in legal procedure.
- The SPCBs have no power to issue legally enforceable administrative orders to resolve a violation without going to the courts for relief. In countries, such as where such powers are vested with state agencies, the routine enforcement is more efficient. For example, the USEPA and state EPAs use administrative enforcement as their preferred first response for routine enforcement because it is viewed as more expedient than the judicial system.

REVENUE ISSUES

- There is a wide variation in the levels of income generated by different boards. SPCBs of highly industrialized states such as Gujarat, Maharashtra and Karnataka are financially better off. A substantial part of the earnings come from the revenue generated by consent fees and cess reimbursements. Other Boards are grappling with financial crisis.
- The flow of finances from the CPCB to SPCBs also creates situations of financial crunch. With cess revenue, the current practice of getting 80 per cent of cess money from the centre by the SPCBs gets delayed every year. This funding system is based on Water Act 1974 and Water Cess Act, 1977. With the advent of Air Act, 1981 and various rules under E(P) Act, no separate fund was created for SPCB and CPCB. This is one of the bottlenecks for the growth of SPCBs as an independent professional body.

Annexure III

Green Clearances and Institutions

ENVIRONMENTAL CLEARANCE: AN END IN ITSELF

The Environmental Impact Assessment (EIA) Notification, 2006, and its subsequent amendments, developed under the provisions of the Environment (Protection) Act, 1986, is the centerpiece legislative framework outlining the process of granting Environmental Clearances (EC) for various development projects based on their potential environmental impacts. However, the clearance process has become an end in itself, involving massive paperwork without any significant improvement in environmental performance on the ground.

Near zero rejection of projects

- Industry lobby portrays environmental clearances as impediments to growth. But the fact is that nearly 100 per cent of the projects are cleared. Very few projects get rejected on environmental grounds.
- Since the inception of the 11th Five Year Plan in 2007, large number of projects for every major development sector has been cleared, much exceeding the required capacity (see attached factsheet on environmental clearances). For example between April 2007 till October 2014, thermal power projects of more than 254,000 megawatt (MW) capacity have been cleared, which is much beyond the estimated capacity of 130,000 MW required till 2022 as per the Planning Commission.
- The status is same in almost every sector. For instance, 269 iron and steel projects with 176 million tonne per annum (MTPA) production capacity has been cleared; 160 cement projects worth 273 MTPA capacity has been cleared. For coal mining, though the de-allocation of coal blocks has now brought into question the fate of many coal clearances, but the fact remains that the environment ministry has not been shy over the years while clearing coal projects. More than 265 projects with cumulative production capacity of about 833 MTPA have been cleared since April 2007.
- Various courts, including the National Green Tribunal (NGT), on a number of occasions have pointed towards the poor environmental scrutiny while evaluating projects for clearance, saying that the appraisal committee takes the words of the project proponent as “gospel of truth”. Therefore there is a clear need to make the appraisal process robust.

Poor quality Environmental Impact Assessment (EIA) reports

- The EIA report is the most important document based on which decisions are made about approving or rejecting a project. However, the completeness and correctness of EIA documents as prepared by project proponents remain questionable. An analysis of the cases at the National Green Tribunal (NGT) shows that a large number of cases involving environment clearance dispute relates to the inaccuracies in the EIA report¹.
- Though an accreditation scheme for EIA consultants has been put in place at the Quality Council of India (QCI) via an Official Memorandum, the scheme is not showing desired results due to various reasons. The most important of them being the lack of coordination between the accreditation

process at QCI and the assessment/ appraisal process of Expert Appraisal Committee (EAC) at MoEF&CC and State EAC. The result of this poor coordination is that there are instances when the reports prepared by non-accredited agencies have also been accepted by EAC and SEAC. There is also a need to build the capacity of the EIA consultants to make good reports. The accreditation process at QCI also needs to be strengthened.

No Cumulative Impact Assessment done

- Projects are cleared without considering the cumulative impact on land, water, pollution, ecology and the health of the people. Currently, all projects are cleared individually, without assessing the cumulative impact on the region or district. This is evident through clearances given in already critically polluted areas (CPAs) such as Singrauli, Korba, Raigad, Hazaribagh.

No post clearance monitoring

- The environmental clearance letters contain a lengthy set of conditions that are to be met once projects are cleared. The problem is that these conditions are set with full knowledge that the government has little capacity to monitor whether developers are complying with environment clearance conditions or not. The regional offices of MoEF&CC have no capacity to inspect projects. The lack of capacity can be gauged by the fact that MoEF&CC do not have manpower to even check the compliance reports submitted by the project proponents.
- Studies and inspections done by various government committees point towards the fact that non-compliance of clearance conditions is norm. The Ministry of Coal in a response to CSE dated November 15, 2011, acknowledged that about 228 mines of Coal India Limited fall under the category of violation of different environmental norms. Blatant violations of conditions has also been observed for iron ore mining projects in all states by the Shah Commission, where it has clearly been shown that companies have extracting iron ores beyond what is stipulated violating mining and environmental norms.

Discounting the importance of public hearing

- The process of public hearing is very important part of the environmental clearance process as it provides an opportunity for the local communities to voice their opinion about a proposed project and express their concerns. However, it is considered as a major hindrance both by the government and the project proponents. Over the past few years, this process has been systematically diluted and public hearings are routinely manipulated excluding people from the process. The result is that people are alienated and are opposing projects across the country. Public hearing process is the only democratic platform to integrate the community in decision-making. We need to strengthen this process further.

Unaccountable EAC and SEAC/SEIAA

- The EACs and SEACs/SEIAAs clear projects with very little due-diligence. An analysis by CSE shows that EAC on an average spends less than an hour – from granting of the Terms of Reference to final recommendation – to clear each project.
- Questions have been raised about the competence of the EAC and SEAC/SEIAA members to do proper assessment. The NGT in a judgement

delivered in July this year, has said that only those people should be appointed as chairpersons and members of expert appraisal committees who have “expertise and experience” in environment-related issues.

- Most importantly, these bodies are also not accountable for poor decision-making. In fact, there is no oversight on SEAC/SEIAA at the state-level.

FOREST CLEARANCE: NO PROPER ASSESSMENT AND NON-TRANSPARENT

The Forest Conservation Act (FCA), 1980, and the rules developed under it, is the umbrella legislation concerning forest clearance in India. The process also involves implementation of the provisions of the Forest Rights Act (FRA), 2006, where diversion of forestland involves forest dependent communities. However there are major problems in the way forestland is being diverted for developmental projects.

Too many clearances with very low rejection

- Ninety four per cent of proposals seeking forest clearance are approved. With such low rejection rate, over the last seven years, about 270,000 hectare (ha) of forestland has been diverted, combining in-principle and final clearances. The rate of forestland diversion has more than doubled since the beginning of the 11th Five Year Plan compared to 1980-2007 period.

No Impact Assessment Report

- No impact assessment report is required for forest land diversion. The information based on which forest land is diverted reads like a botanical report – number of trees, girth of trees, types of trees, etc. There is no assessment of the impact the forest diversion on the ecology, water resources or the people living in the area. There is also no discussion regarding the impact of replacing one type of forest by the other, impacts on soil erosion, habitat fragmentation etc., which are long term considerations for any kind of forestland diversion.

Ecosystem impact not considered

- The impact for forestland is not a “point source” problem, but is an ecosystem level issue given the continuity and complexity of forest habitats. Therefore the absence of ecosystem level study to assess the impacts of forestland diversion, makes it impossible to understand the actual impact of such action.

Non transparent

- Usually none of the information that leads to the diversion of forestlands, such as the information provided by the project proponent, the various reports etc. are put in public domain. As of now only the forest clearance letters are put in public domain. There is no involvement of the affected community in the entire process.

Noncompliance and poor monitoring of clearance conditions

- Compliance of clearance conditions as stipulated in the clearance letters is a major challenge for forest clearance. There is a clear lack of intention and capacity for complying with such conditions on part of the project proponent and the state officials. Data analyzed by CSE shows that majority of projects are not inspected post-clearance. Of the projects that are inspected, a large majority is found to be non-compliant.

Compensatory afforestation issues

- Compensatory afforestation is a key for in-principle clearances. Based on a report submitted by the state government affirming fulfillment of this condition, the final clearance is granted. However the report of the Comptroller Auditor General (CAG) on Compensatory Afforestation Fund Management and Planning Authority (CAMPA) released in 2013, noticed serious shortcomings in regulatory issues related to diversion of forest land

and the dismal failure of the compensatory afforestation scheme.

- For undertaking compensatory afforestation against forestland diversion, an equivalent area of non-forest land needs to be received by the Government. However, for the period of 2006-2012, against the receivable non-forest land of about 1,03,381.91 hectare (ha) for compensatory afforestation, only 28,086 ha was received, constituting only 27 per cent of receivable non-forest land. Compensatory afforestation done over the non-forest land received was abysmal. Out of 1,03,381.91 ha, afforestation was done only on 7,280.84 ha, merely seven per cent.
- Regarding fund disbursement and utilization for CAMPA, the CAG audit found that out of Rs. 2,925.65 crore of the compensatory afforestation funds released by Ad-hoc CAMPA between 2009-12, only Rs. 1,775.84 crore were utilised by the State/UTs leaving an unutilised balance of Rs. 1,149.81 crore. In 11 of the selected 30 State/ UTs, utilisation ranged between zero to 50 per cent, indicating very poor utilization.
- Compensatory afforestation is also leading to serious land alienation issues. People are now being displaced from their lands for compensatory afforestation.

Forest Rights Act implementation

- Strengthening the implementation of FRA, 2006 is another matter requiring urgent attention. Even after eight years of its commencement, issues involving settlement of rights of forest dwelling communities has been a highly contested matter for many prominent projects. Problems exist with the convening of Gram Sabha without proper representation, harassment and forceful eviction of forest dwellers without settlement of their forest rights; rejection of claims and inadequate knowledge of the state authorities about the provisions of the Act etc. There are major ambiguities regarding the settlement of the community rights as well; most states are not settling community rights.

COASTAL REGULATION ZONE CLEARANCE: NO MAPS, NO PLANS

The Coastal Regulation Zone (CRZ) Notification, 2011, outlines the delineation of coastal zone and permissible activities within the coastal areas. However there are a number of issues with the regulatory mechanism for conserving our coasts and permitting activities in the coastal areas.

Understanding the coastal zone

- India primarily uses a distance – based approach for defining its coastal areas. As per provisions of the CRZ Notification, 2011, the coastal zone is typically understood as the area from the High Tide Line (HTL) to 500 meters (m) on the landward side.
- Besides these, other areas in the landward side that fall under CRZ include the inter-tidal zone -area between HTL and Low Tide Line (LTL); area falling between the hazard line and 500m from HTL on the landward side (for tidal influenced water bodies this distance is 100m).
- However given the dynamic nature of the coastal areas and the vulnerability to climatic conditions, the vulnerability index of coastal areas should also be taken into account to develop a comprehensive understanding of our coasts. Activities should be accordingly permitted in these areas.
- The present notification looks at permitting or prohibiting activities in the CRZ primarily from developmental perspective, with very little provisions for coastal communities or habitat conservation. This needs to be incorporated.

Status of Coastal Zone Management Plans and Maps

- Coastal Zone Management Plans (CZMPs) and maps are the most important components for planning and scientific management of coastal areas. However, currently no CZMPs or maps have been finalized as per provisions of the CRZ Notification, 2011. The last maps that were developed based on the CRZ Notification 1991 remain dated.
- The CRZ Notification enacted in January 2011, had specified that the coastal states/UTs should prepare draft CZMPs in 1:25,000 scale map, within a period of 24 months, i.e., January, 2013. The plans after being appraised by respective Coastal Zone Management Authorities (CZMA) should be submitted to the MoEF&CC². However the ministry has not received any plans from the state governments/UTs, the preparations of which are noted to be in progress. Noting such delay, the ministry in May, 2014 issued a notification specifying that the CZMAs of states/UTs, should submit the draft CZMPs, along with their recommendations (considering stakeholder inputs), to the MoEF&CC before September 30, 2014.
- As per latest information of the union ministry, the ministry is still awaiting such submission, as preparation of CZMPs remains in progress³. In the absence of updated plans and maps, coastal zones that are extremely dynamic in nature, continue to be regulated based on the plans prepared two decades back. The ministry therefore needs to prevent any further delay with regard to preparation and submissions of plans and maps that reflect the current status of coastal areas.

No uniform mechanism for CRZ demarcation

- At present MoEF has authorised seven agencies for demarcating CRZ both at national and project level. The various agencies use different protocols for demarcating the coastal zone. There is a need to review the scientific protocols being used by the different authorised agencies undertaking CRZ demarcation and come out with a uniform guideline. New authorised agencies should be added to undertake this work, including state remote sensing agencies⁴.

Non transparency in mapping

- There has been a lot of controversy about certain project proponents submitting false or wrong maps of the coastal zones where a proposed development activity is to take place. The project-level High Tide Line (HTL) and Low Tide Line (LTL) demarcation is often paid for by the proponent, which ideally should be a state level exercise funded by the government.

Mapping guidelines for HTL/LTL

- The current mapping guidelines, at two very different scales- 1:25,000 and 1:4000- does not allow for verification of the HTL/LTL maps at the project level. It also does not allow for assessment based on the 'original' HTL/LTL and to check for deviation or distortions. There is a need to decide on the issue of the 'original' HTL/LTL and how policy can and should reflect the dynamic nature of the coastline.

Non-availability of maps in public domain

- Even if whatever maps are available, currently they are extremely difficult to access for verifying information. Therefore all cadastral level project mapping carried out should be put in public domain. There is a need to explore if these cadastral maps can be combined for different coastal stretches of the country to come up with a national level cadastral map.

Poor quality Environmental Impact Assessment (EIA)/Marine EIA reports

- Just like environmental clearances, the present clearance system for coastal areas is fraught with problems of sub-quality EIA reports that continue to plague coastal projects.

Poor monitoring of clearance conditions

- Monitoring of clearance conditions for projects in CRZ is also an area of concern and needs to be strengthened. It is important to have geo-referenced locations included in the conditions with landsat imagery analysis.

ECO SENSITIVE ZONE

The National Environment Policy, 2006 defines Eco Sensitive Zones (ESZ) as areas/zones, ‘with identified environmental resources having incomparable values which require special attention for their conservation’⁵. According to the National Wildlife Action Plan (2002-2016), these areas are vital ecological corridors which need to be protected to prevent fragmentation of biodiversity. The purpose of delineating ESZ is to create a buffer around protected areas or other natural sites of high ecological significance, and protect the biological integrity of those areas by regulating activities within them⁶. In recent times a lot of controversy about undertaking developmental activities in proximity to national parks or wildlife sanctuaries has been with regard to areas that are to be considered as ESZ.

Notifying Eco Sensitive Zones around national parks and sanctuaries

- The MoEF&CC is the nodal Ministry for notifying the ESZ under provisions of the Environment (Protection) Act, 1986. The notification is done by the union ministry following receipt of proposals from the state government. Though the ministry in 2005, asked the states to delineate their ESZ and submit the proposals to the ministry, and the Supreme Court also gave direction in December, 2006 in this regard, after nearly 10 years, many states are yet to define their ESZ. According to ministry information of 2013, 450 proposals of ESZ notification have been received from various states, while more than 160 proposals for ESZs around protected areas are awaited⁷.
- The ESZs that have been notified so far are only a handful. As of August, 2014, final ESZ notifications have been issued for 22 areas involving protected and non-protected ones by MoEF&CC. Additionally draft ESZ notifications have been issued for additional 18 areas. Among these except for three⁸, all have been notified in the post 2006 period.
- In absence of a notified ESZ, an activity that can or cannot be permitted within a particular area remains contentious. Therefore both state governments and the ministry should complete the task of delineating ESZ at the earliest.

Monitoring of Eco Sensitive Zones

- Notifying ESZ is not the only concern. Under the Eco-Sensitive Zone Notification, a monitoring committee is constituted to ensure compliance with regulations and monitor activities within such zones. However, in most cases either a monitoring committee is absent, or remains largely ineffective, making the notification of the ESZ meaningless⁹.
- For example the Aravalli ESZ was notified in 1992. In 1999 a committee was formed for the management of the ESZ besides the state government. However it has been observed that mining activities are continuing in the ESZ, with the concerned committee remaining least effective in monitoring such activities. The Numali ESZ that was set up in 1996, did not have a committee in 15 years time. The Matheran ESZ notified in 2003 though initially had a monitoring committee set up to monitor the compliance of the notification conditions does not have a committee since 2008¹⁰.

Development of zonal master plans

- A key component of the ESZ notification is the preparation of a zonal master plan, which, once approved by MoEF, is expected to become the basis of regulating development. The plan, which in most cases, was to be prepared within two years, would indicate the areas for industries; demarcate forest and green areas and horticultural areas. However in most cases such plans are absent. For example in case of Mahabaleshwar and Matheran, two very important ESZ in the Western Ghats in Maharashtra, which were notified in 2001 and 2003, no such plans have been prepared. As a result, the compliance with the eco-sensitive zone regulation has been abysmally poor.

References

Annexure I

1. J.S. Kamyotra et al. 2013, Status of water quality in India: 2011. Central Pollution Control Board, New Delhi.
2. Anon 2013, *Annual report 2011-12*, Central Pollution Control Board, New Delhi, http://cpcb.nic.in/upload/AnnualReports/AnnualReport_43_AR_2011-12_English.pdf
3. These urban centers reflect Class I and Class II cities, and constitute more than 70 per cent of India's urban population.
4. Anon 2006, *Environmental compliance and enforcement in India: Rapid Assessment*, The Organisation for Economic Co-operation and Development (OECD), p.7.
5. According to the MSW Rules, 2000, "municipal authority" means municipal corporation, municipality, nagar palika, nagar nigam, nagar panchayat, municipal council including notified area committee (NAC) or any other local body constituted under the relevant statutes and, where the management and handling of municipal solid waste is entrusted to such agency.
6. Anon, *Status report on municipal solid waste management*, Central Pollution Control Board, p. 2-10, http://www.cpcb.nic.in/divisionsofheadoffice/pcp/MSW_Report.pdf
7. According to Census 2011
8. *ibid*
9. Estimated according to Census 2011, 1.21 billion population, where consumption of plastic products is 9.7 kilogram per person as per FICCI, Available at <http://www.ficci.com/spdocument/20396/Knowledge-Paper-ps.pdf>.
10. Anon 2013, *Annual report 2011-12*, Central Pollution Control Board, New Delhi, p. 247.
11. According to Central Pollution Control Board estimates, 70 percent is disposed as waste.
12. Anon 2013, *Website Material on Plastic Waste Management*, Central Pollution Control Board, New Delhi, http://www.cpcb.nic.in/divisionsofheadoffice/pcp/management_plasticwaste.pdf.
13. *ibid*
14. Anon 2010, *General Status of Implementation of The Batteries (Management & Handling) Rules, 2001, in Madhya Pradesh*, Madhya Pradesh Pollution Control Board, http://www.mppcb.nic.in/pdf/Batteries_Info-2010.pdf.
15. *ibid*
16. Sudha Nambudiri 2013, Directive issued on used battery disposal, in the *Times of India*, The Times Group, Mumbai, <http://timesofindia.indiatimes.com/city/kochi/Directive-issued-on-used-battery-disposal/articleshow/23761615.cms>.
17. Anon, *Existing Scenario of Hazardous Waste Management in India*, Central Pollution Control Board, New Delhi, http://www.cpcb.nic.in/Updated_Inventory_HW_Generation.pdf.
18. *ibid*
19. *ibid*
20. *ibid*
21. *ibid*
22. *ibid*

Annexure II

1. Geetanjoy Sahu et al. 2013, *Environmental Regulatory Authorities in India: An assessment of State Pollution Control Board*, Tata Institute of Social Science, Mumbai, p. 31.
2. Anon 2005, Final report on institutional capacity building, Madhya Pradesh Pollution Control Board, p.7, <http://mpcb.gov.in/images/pdf/instcapacity1.pdf>.

Annexure III

1. September 2014, Draft review report of NGT, Centre for Science and Environment, New Delhi, mimeo.
2. January 2011, *Coastal Regulation Zone Notification*, Ministry of Environment and Forests and Climate Change (MoEF&CC), New Delhi, p. 6-7, <http://www.moef.nic.in/downloads/public-information/CRZ-Notification-2011.pdf>.
3. May, 2014, *Notification of Ministry of Environment and Forests and Climate Change (MoEF&CC)*, New Delhi, <http://envfor.nic.in/sites/default/files/1244-e.pdf>.
4. April 2013, Report of the Committee for Inspection of M/S Adani Port and SEZ Ltd., Mundra Gugajat, Ministry of Environment and Forests, New Delhi, p. 85-86, http://www.indiaenvironmentportal.org.in/files/file/adani_final_report.pdf
5. October 2014, Ministry of Environment and Forests and Climate Change (MoEF&CC), New Delhi, http://envfor.nic.in/division/research-development?theme=moef_aqua.
6. February 2011, *Guidelines for declaration of eco-sensitive zones around national parks and wildlife sanctuaries*, Ministry of Environment and Forests and Climate Change (MoEF&CC), New Delhi, <http://www.moef.nic.in/downloads/public-information/Guidelines%20for%20Eco-Sensitive%20Zone.pdf>.
7. July 2013, Submission of proposal to the states for declaration of eco-sensitive zones around national parks and wildlife sanctuaries, Ministry of Environment and Forests and Climate Change (MoEF&CC), New Delhi, <http://www.moef.nic.in/sites/default/files/scan0202.pdf>
8. Dhanu, Mahabaleswar-Panchgani and Matheran eco-sensitive zones in Maharashtra, was notified in 1991, 2001 and 2003 respectively.
9. Meenakshi Kapoor et al 2009, *India's notified ecologically sensitive areas (ESAs): the story so far*, Kalpavriksh, Pune, p. 98-101, http://assets.wwfindia.org/downloads/indias_notified_ecologicallysensitive_areas.pdf
10. *ibid*