# FILLING THE BLANKS

## A DISCUSSION PAPER ON STRENGTHENING ENVIRONMENTAL GOVERNANCE


Centre for Science and Environment

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# Preface

In 2009, we had published a report titled 'Turnaround: Reform Agenda for the Environment Regulators of India', highlighting the capacity gaps prevailing at State Pollution Control Boards (SPCBs). Our findings were in consonance with the results of studies carried out previously by the Bhattacharya Committee, 1984; the Belliappa Committee, 1990; the Administrative Staff College of India, 1994; and the Planning Commission of India, 2001-02. We identified lack of trained humanpower, financial constraints, lengthy legal processes, weak penal provisions and non-transparent functioning as some of the core reasons for poor performance of the SPCBs. In a nutshell, we recommended that SPCBs be "professionalised".

Five years hence, we are revisiting the study; but this time to look at the functional capacity gaps. The SPCBs are vested with huge powers in the different acts, laws and legislations of the country. We have analysed the laws and grouped the responsibilities of SPCBs in four major areas -- regulatory, advisory role, data management and capacity building of stakeholders, and research and development. The functional areas were further analysed with respect to the capacity gaps existing at the individual, organisational and system/policy level to comprehend why it is difficult for SPCBs to fulfill their mandate. We've investigated whether the performance of SPCBs will improve if these dots were joined.

We wish to take this study to SPCBs to elicit their responses on our evaluation. We are organising a series of regional stakeholder meetings in different parts of the country to take the feedback of SPCBs and other stakeholders on this report.

Recently, the ministry of environment and forests has constituted a high powered committee to review and propose necessary amendments in the major environmental regulations such as Environment Protection Act, Forest Conservation Act, Wildlife Protection Act, the Water act and the Air Act. We hope our research will be useful in this review process. Our ultimate objective is to reform environmental governance in the country so that we can develop, but in an environmentally sustainable manner.

**Chandra Bhushan**

# 1. Making regulations, and the regulatory and monitoring functions

State Pollution Control Boards were constituted under Section 4 of the Water (Prevention and Control of Pollution) Act, 1974. The preamble of the Act provides for the prevention and control of water pollution and maintaining or restoring the wholesomeness of water. The Air (Prevention and Control of Pollution) Act was enacted in 1981 and the responsibility of its implementation was given to SPCBs. The preamble of this Act also provides for the prevention, control and abatement of air pollution. In the years since these Acts were enacted, the situation in terms of quality of ground/surface water and air has gone from bad to worse. It puts question marks on (a) the ability of the two Acts to strengthen the boards enough so that they are able to implement, and (b) the capability of the boards to effectively use the provisions of the Acts to meet their overall objectives.

The major responsibilities of the SPCBs as emphasised under Water Act, 1974 and Air Act, 1981 can be categorised as follows:

- Making rules
- Environmental monitoring
- Consent and authorisation
- Inspection and compliance assurance
- Self-regulation, including environmental audit
- Penal provisions

### Making rules

The Water and Air Acts empower the boards to make regulations

- for laying down and modifying trade effluents/sewage standards
- for laying down standards for emission of air pollutants into the atmosphere from industrial plants and automobiles or for discharge of air pollutants into the atmosphere; this is to be done in consultation with the CPCB and keeping in mind the standards for air quality laid down by it.

Section 17 (1 k) of the Water Act puts it thus: *"to lay down standards of treatment of sewage and trade effluents to be discharged into any particular stream taking into account the minimum fair weather dilution available in that stream and the tolerance limits of pollution permissible in the water of the stream, after the discharge of such effluents."* The section clearly says that the boards should specify the standards taking into account the assimilative capacity of the receiving body. In order to protect the water body, SPCBs have the power to make stringent standards or specify load-based standards to maintain the wholesomeness of water. Barring a few cases, SPCBs have never used this power to protect water bodies.

SPCB's also have powers under Section 17 (1 m) of the Water Act to advise the state government with respect to the location of any industry, the carrying on of which is likely to pollute a stream or well. The said function clearly empowers a board to advise its state government to change the location of any industry if it is likely to pollute a stream or well. This is important, considering the overall objective of the board to maintain wholesomeness of water. However, none of the boards have come up with a comprehensive document on how they will maintain or restore the wholesomeness of water.

## AGENDA FOR DISCUSSION

**Why have SPCBs failed to maintain or restore the wholesomeness of a water body?**

**Why have SPCBs not opted for stringent standards to maintain the quality of water/air?**

**How can stakeholders be engaged to maintain ambient air/water quality standards?**

**Table 1: Capacity gap analysis: Making regulations**

| Key tasks/functions | Competency required by the staff to perform the tasks/ functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/govern-ment level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Lay down, modify or annul effluent standards for sewage and trade effluents and for the quality of receiving waters (not being water in an inter-state stream) resulting from the discharge of effluents and to classify waters of the state<br><br>To lay down, in consultation with the Central board and having regard to the standards for the quality of air laid down by the Central board, standards for emission of air pollutants into the atmosphere from industrial plants and automobiles or for the discharge of any air pollutant into the atmosphere from any other source | Overall work objective and methods to achieve the said objective<br><br>Computation of assimilative capacity of receiving water body<br><br>Evolve load-based standards to make it industry specific/location specific<br><br>Computation of dispersibility of air emission | Mapping of rivers on the basis of critical and non critical stretch<br><br>Mapping of critical air shed or non-attainment cities<br><br>Capacity building programme:<br>● GIS/GPS mapping system (software)<br>● Location specific standards<br><br>Availability of technical infrastructure<br><br>Hiring experts as consultants | Integrated action plan involving multi-stakeholders to maintain the wholesomeness of water by state government<br><br>Integrated action plan involving multi-stakeholders to improve the air quality by the state government |

### Environmental monitoring

Monitoring is an important function of an SPCB. Monitoring is of two types: one, where ambient water, air or noise quality is monitored to find out the status of national ambient environmental quality with respect to the national standards; and two, where there exists a compliance assurance programme to identify sources with respect to effluent and emission standards.

In 1984, the NAAQM (National Ambient Air Quality Monitoring) was initiated by the CPCB to assess ambient air quality all over India. The network consists of 573 operating stations covering 240 cities/towns in 26 states and four Union territories of the country. The monitoring of pollutants is carried out for 24 hours (four-hourly sampling for gaseous pollutants and eight-hourly sampling for particulate matter), with a frequency of twice a week and an aim of having 104 observations in a year. The monitoring is being carried out with the help of the CPCB, the SPCBs, pollution control committees (PCCs) and the National Environmental Engineering Research Institute (NEERI), Nagpur.

The CPCB, in collaboration with concerned SPCBs/PCCs, has also established a nation-wide network for water quality monitoring, comprising of 2,500 stations in 28 states and six Union territories. The monitoring is done on a monthly or quarterly basis in the case of surface water and on a half-yearly

**Table 2: Capacity gap analysis: Environmental monitoring**

| Key tasks/functions | Competency required by the staff to perform the tasks/ functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/govern-ment level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Monitoring air, water, noise quality<br><br>Monitoring wastewater, hazardous waste, stack monitoring | Knowledge of sampling, analysis and carry out monitoring | Capacity building<br><br>Resources (technical, infrastructure and financial)<br><br>Fix sampling locations<br><br>Monitoring data on GIS platform<br><br>Independent department on monitoring and analysis<br><br>Accreditation of laboratories | Standardised monitoring and sampling protocols |

**AGENDA FOR DISCUSSION**

**How can SPCBs be more effective in carrying out their monitoring duties?**

**What technological provisions can improve the environmental monitoring scenario in the states?**

**How will industry and other stakeholders be associated with the work of NAMP and NWQMP?**

basis in the case of groundwater. The monitoring network covers 445 rivers, 154 lakes, 12 tanks, 78 ponds, 41 creeks, 25 canals, 45 drains, 10 water treatment plants (WTPs, raw water) and 807 wells. Among the 2,500 stations, 1,275 are on rivers, 190 on lakes, 45 on drains, 41 on canals, 12 on tanks, 41 on creeks/seawater and 79 on ponds. There are 10 WTPs and 807 groundwater stations. The system, however, suffers from deficient measurements and non-operational stations in dry seasons.

The basic limitations of these programmes are humanpower and funds. Although guidelines/protocols have been evolved to carry out the programme, they cannot be followed strictly due to in accessibility to stations in all seasons. As for the rivers, neither do they have enough flow for effective sampling nor do they have mixing zones that are located at a convenient distance.

For effective monitoring, it is important that trained and senior staff takes samples of air/water parameters from time to time. These samples have to be analysed to derive results on the quality of environment. The quality of laboratories for analysis of samples is, thus, very important for SPCBs to perform their monitoring functions. It has been pointed often that the laboratories of SPCBs suffer from inadequate infrastructure and online monitoring stations to track pollution on a continuous basis.

Compliance monitoring on point source has no protocol with respect to frequency. It is random in nature. The location of monitoring with respect to discharge of watewater has to be from the designated outlet as per the law; however, designated outlets with facilities for sampling are absent in many cases. Although an SPCB may be equipped for sampling effluents, this may not be true with respect to air emissions as the facilities at stack are usually not adequate.

### Consent/authorisation mechanism

Under the command and control regime of the Water (Prevention and Control) Act, 1974 and the Air (Prevention and Control) Act, 1984, the boards are empowered to grant consent and ensure compliance of consent conditions. Consent can be defined as a permit to discharge/emit pollutants within the limit stipulated by the regulatory authority. Under these Acts, the regulatory authorities are the SPCBs in their respective states and the PCCs in the Union territories.

Consent documents contain statutory standards and various conditions that an industry has to adhere with. There is, however, no standard protocol on how to grant consent. It has been more than three decades since the Acts have been enacted, but none of the SPCBs has laid down a protocol on how consent can be granted. Though there is no formal reference in the Acts on how to grant consent, the boards could have come up with a guideline/protocol to bring uniformity in how consent is to be granted in different parts of the country. Consent conditions are simply treated as a routine exercise following age-old practices. There is no assessment of the kind of impacts a new plant or a plant slated for expansion will have on existing environmental conditions or assimilative capacity of a river. **This puts a question mark on the consent management system in the country: is the system working or does it needs reforms?** SPCB officers also say that they have never undergone any formal capacity building programme specifically on how to grant consent.

**Table 3: Capacity gap analysis: Consent/authorisation mechanism**

| Key tasks/functions | Competency required by the staff to perform the tasks/functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/govern-ment level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Processing consent (to operate/establish) applications | Knowledge on type of industry, best practicable technology, reporting system, local state of environment, local legislations restricting industries (carrying capacity)<br><br>Skill: Noting and drafting, validation technique of information, asking right questions for generating required information | Protocol/manual for granting consent<br><br>Resources (financial and human)<br><br>Computerisation<br><br>Laboratory facility<br><br>Consent register/data disclosure on website<br><br>Compliance monitoring<br><br>Data sharing and centralised data bank<br><br>Consent facilitation (Information facilitation and support, empaneled consultants, checking of adequacy) | Consent management protocol needs to be notified<br><br>Legal and economic analysis |

## AGENDA FOR DISCUSSION

**Why is a protocol/manual on 'how to grant consent' required?**

**How can other stakeholders (apart from industry and SPCBs) be involved in consent management?**

**An industry is required to have both environmental clearance and consent before starting operations. What is the need for mandating both?**

**There have been numerous instances of deemed consent in the country. How can this be avoided and who should be held responsible?**

**In the case of capacity enhancement, shouldn't there be an enhanced role of an SPCB when EC is granted?**

**How can compliance be defined?**

Shortage of humanpower is an important factor which is affecting the performance of SPCBs at various levels. Processing consent applications requires time; it involves analysing the application, understanding existing environmental situation by reviewing consent applications of nearby industries, and conducting on-the-spot inspections. Andhra Pradesh, Gujarat, Haryana, Karnataka, Punjab and Tamil Nadu have high percentages of vacant posts. In states like Andhra Pradesh, it is as high as 61 per cent, 48 per cent in Kerala, 28 per cent in Tamil Nadu and 34 per cent in Gujarat. The Kerala State Pollution Control Board operates with a staff strength which it had been allocated way back in 1995, although new concerns such as municipal solid waste management, biomedical waste and high-rise buildings have been brought under its ambit. Out of its sanctioned staff strength of around 320, 150 are lying vacant.

Consent management also lacks transparency. The communication is conducted only between SPCBs and the industry seeking consent; the local community is not involved at any stage of consent management. In fact, local communities could be the best sources for SPCBs to generate information on local conditions and could act as watchdogs: they can provide instant information on non-compliance by industries.

### Inspection and compliance assurance

Under the Water and Air Acts, pollution control boards have the authority to collect samples, inspect facilities, impose corrective action and prescribe compliance schedules. Inspection of industries involves checking compliance of consent conditions, collection of untreated/treated samples, collection of hazardous waste samples for analysis, and observation of the concentration of pollutants in the sample. Stack emissions are also monitored. The boards inspect facilities to ensure adequate treatment of wastewater and air pollution control system. Arrangements made for reuse and disposal of solid and hazardous wastes are also verified. The number of inspections undertaken by a board gives an idea of its pro-activeness in monitoring. Ideally, a greater number of inspections can keep board officials well informed about the performance of the industrial unit in accordance with prescribed pollution norms.

Inspection is an important aspect in the command and control approach to evaluate the compliance status of the norms laid down by the regulatory authorities. A good systematic inspection not only ensures compliance but also improves the performance of industry or common waste management facility. If compliance to consent condition is the goal, inspection is a success measurement tool.

Inspectors at CPCB/SPCBs are generally well educated and technically proficient, but their educational background and current training does not necessarily prepare them for the technical and procedural issues regarding compliance and enforcement. Some SPCBs have a basic one week training programme for inspectors on general compliance and enforcement, but the number of training programmes designed for specific compliance and enforcement issues is limited. Even if training is provided, many inspectors do not receive it because of travel or time constraints. There is also no national guideline on the minimum training and field requirements for an inspector or a centralised repository for training programmes and materials. These affect the quality of inspection. Moreover the inspection report of one industry prepared by different inspectors differs greatly. The reason is there is no inspection checklist available with the officials. The USEPA and European countries have developed inspection checklists which cover the inspection right from the entry point to the reconnaissance survey.

**Table 4: Capacity gap analysis: Inspection and compliance assurance**

| Key tasks/functions | Competency required by the staff to perform the tasks/ functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/govern-ment level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Inspect sewage or trade effluents, works and plants/air pollution control areas<br><br>Check compliance of consent conditions<br><br>Collect untreated/ treated samples for analysis, and observation of the concentration of pollutants in the sample<br><br>Prescribe corrective actions and compliance schedules<br><br>Inspect technology, processes | Skill development<br>● Understanding of industrial processes<br>● Performance evaluation of pollution control devices<br>● Evaluation of pollution assessment techniques<br>● Evaluation and assessment of information/data/do cumentation | Capacity building programme<br>● Inspection protocol/manual<br>● Standard reporting system<br>● Inspection checklist<br>● Knowledge on international best practices<br><br>Infrastructure and technical support for inspection<br><br>Humanpower | Inspection protocol/manu al/checklist<br><br>Uniform procedure on appeal and appellate authority |

**AGENDA FOR DISCUSSION**

**What protocol is required for effective inspection?**

**What is the capacity building required for staff at SPCBs to carry out meaningful inspection?**

**How can inspection be institutionalised as a proactive measure?**

Inspection can take place for collecting legal samples or based on some complaint. But the important aspects of inspection are compliance assurance. Inspections are done in order to check the implementation of compliance conditions. The CPCB has promulgated (a) industry-specific standards and (b) general standards wherever specific industrial standards are not applicable. These standards stipulate pollutant-specific limits beyond which air and water polluting units are not permitted to emit or discharge. The state boards are entitled to make these standards more stringent. The standards, as they exist, are framed on the basis of concentration instead of load. This encourages dilution of effluents in order to achieve the desired level of concentration. Also, concentration-based standards discount the assimilative capacity of the environment. This is precisely the reason why despite claims by SPCBs of industries meeting standards, rivers remain polluted and ambient air quality keeps worsening in India.

As far as compliance is concerned, most boards claim that a majority of industries are complying with the standards. *However, compliance is defined quite uniquely in India: industries having pollution control equipment are considered to be in compliance with standards!* The data on actual compliance status based on monitoring and inspection is not compiled by most boards.

One approach is to link consent management to performance. For example, in Andhra Pradesh and Gujarat, many industries in the bulk drug and pharmaceutical sectors frequently change their product-mix to stay competitive; They have good compliance records as well. However, they do not report this change to the SPCBs as it would require seeking a new CTE every time they change. Companies which consistently meet or exceed the standards for compliance should be given the regulatory flexibility to modify their existing CTO if they agree to certain parameters for improved environmental performance. In addition, the period of permit renewal for CTEs could be linked to compliance performance, extending the length of permits for stronger performing companies. This would reduce the burden of under-staffed SPCBs and allow them to focus scarce resources on violators.

It is important to underline the fact that data on compliance is not compiled by most SPCBs; whatever data is available, needs to be interpreted with caution. Compliance is not only about the accountability of industries; it is also about the accountability of the SPCBs themselves.

### Self-regulation and environmental audit

In India, to bring an industry to court for non-compliance, SPCBs have to collect 'legal samples' as evidence. Even though self-monitoring, maintaining records and environmental statements are established parts of the compliance mechanism (they are integral parts of the consent to establish, consent to operate and environment clearance process), SPCBs do not use this data for enforcement actions.

The reason for this is the interpretation of Section 21 of the Water Act, Section 26 of the Air Act and Section 11 of the Environment Protection Act (EPA), which deal with the collection of samples. They have been interpreted by the boards as requiring legal samples as evidence in any enforcement action brought before the courts. Even in a case where Section 5 of the EPA (under which closure notice can be issued) is applied, if the closure notice is challenged in court by the factory, the SPCB or CPCB cannot use self-monitoring data – the boards will have to produce the results of the legal sampling which is admissible evidence under the law.

Self-regulation is an integral part of the compliance mechanism in international practices. In the European Union, the burden of proof lies with the polluters. It is, however, different in India's case where the 'burden of proof' lies with the SPCB. Section 21(2) of the Water Act clearly states: "*The result of any analysis of a sample of any sewage or trade effluent taken shall not be admissible in evidence in a legal proceeding unless legal sample is collected with due procedure.*" Therefore, the records and the results submitted by polluters are not admissible evidence in the court of law. The absence of a self-regulation mechanism as an admissible evidence weakens the compliance assurance system.

The MoEF, in a 2010 paper on *Reform for Environmental Governance*, had said Industrial self-monitoring, reporting and verification processes need to be refined and appropriate provisions incorporated in the body of the EPA itself. Disclosure statements need to be put in the public domain to ensure oversight by the civil society and its appropriate linkage with the regulatory regime. It is also imperative that an enabling provision be made in the Act for regulatory authorities to levy and collect fees for specific services. This would go a long way in making these bodies financially autonomous and thus, more effective.

India is the only country in the world to make environmental statement (audit) compulsory. The government of India, by its gazette notification of March 13, 1992, made it mandatory for all the industries to provide annual environmental statement for their operations, beginning 1992-93. This required industries to provide details of water, raw materials and energy resources used, and the products and wastes generated by them. These audit reports were to be submitted to the respective SPCBs on or before September 30 every year.

**Table 5: Capacity gap analysis: Self-regulation and environmental auditing**

| Key tasks/functions | Competency required by the staff to perform the tasks/ functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/govern-ment level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Obtain right information from the company<br><br>Industries to provide annual environmental statement/ audit to SPCBs | Knowledge of format<br><br>Knowledge on validation of audit report | Protocol on self-regulation assurance of data produced<br><br>Limited protocol on continuous monitoring<br><br>Procedure for accreditation and empanelment of auditors<br><br>Protocol for auditing procedure<br><br>Capacity building<br><br>Policy on composition and qualification of auditors<br><br>Humanpower for reviewing audited report | Self-regulation legally admissible<br><br>Integration of audit procedures in compliance mechanism<br><br>Policy on presenting the statement on websites (SPCB/industry) |

## AGENDA FOR DISCUSSION

**How can self-regulation be ensured within the legal procedure?**

**Is there a need for a national level guideline on environmental statements as per the direction of the Gujarat High court?**

**What guidelines are required for accreditation of auditors?**

**Can environmental audit be a good tool for assuring compliance?**

Environmental audit was an important step to invite professionals to audit the industries which would eventually reduce the burden of SPCBs as well as industry. Unfortunately, it was not implemented in the spirit of the law. The whole process has inherent problems. Firstly, who will audit? As in the case of an EIA report, the industry has the freedom to choose the auditor. This has affected the quality of environmental statements. It is difficult to understand how an auditor paid by industry will write against it.

Secondly, the E (P) Act provides Form V to be filled in by the auditor during the audit process. But the rule does not mention the process on how the environmental data will be generated and reported within the framework of the law. Normally, the auditor submits reports based on the information provided by the industry which leads to him submitting more or less the same report year by year. This is in contrast to what the rules envisaged. The role of the auditor is to validate/cross-check the data of the industry using material balance, water balance, energy balance, and pollution assessment, and following performance evaluation of the pollution control devices.

Thirdly, the rule is silent on the composition and qualification of the audit team and their empanelment. The High Court of Gujarat had directed GPCB to come out with a policy on composition and qualification of audit teams. The GPCB issued a guideline for environmental auditors. In order to strengthen the system, it is imperative for all other SPCBs to adopt such a protocol.

Fourthly, it is observed that environmental statements submitted by industry to SPCBs is not evaluated by them. The reason is lack of humanpower. Besides, the format of audit leaves little scope of review. Moreover, SPCB officers lack skills to review the audit report.

### Penal provisions

The penal provisions in the environmental acts of India are not enough for curbing non-compliance. Section 15 of the Environment Protection Act, 1986 says: *"Whoever fails to comply with or contravenes any of the provisions of this Act, or the rules made or orders or directions issued there under, shall, in respect of each such failure or contravention, be punishable with imprisonment for a term which may extend to five years with fine which may extend to one lakh rupees".*

Section 41 of the Water Act, 1974 says: *"Whoever fails to comply with any direction given under sub-section (2) or sub-section (3) of section 20 within such time as may be specified in the direction shall, or conviction, be punishable with imprisonment for a term which may extend to three months or*

*with fine which may extend to ten thousand rupees or with both and in case the failure continues, with an additional fine which may extend to five thousand rupees for every day during which such failure continues after the conviction for the first such failure".*

Section 37 (1) of the Air Act, 1981 says: *"Whoever fails to comply with the provisions of section 21 or section 22 or directions issued under section 3 1 A, shall, in respect of each such failure, be punishable with imprisonment for a terms which shall not be less than one year and six months but which may extend to six years and with fine, and in case the failure continues, with an additional fine which may extend to five thousand rupees for every day during which such failure continues after the conviction for the first such failure".*

It can be inferred that the penalty for non-compliance is not stringent enough to act as a deterrent. The industries violating the norms of pollution control can easily get away with paying Rs 1 lakh or Rs 10,000, as the case may be. Other enforcement powers of SPCBs include emergency measures of disconnecting water or power supply and facility closure, which are widely used in some states. According to the Hazardous Wastes (Management and Handling) Rules of 1989, SPCBs can, with CPCB approval, impose administrative fines for any violation of those rules. Maharashtra is one of the very few states that have used this provision to impose penalties for unauthorised storage of hazardous waste. Other sanctions (fines and imprisonment) must be pursued under the criminal authority of the courts. The EPA stipulates steeper penalties than the Water and Air Acts, but at the same time defers to them (Section 24 of the EPA) in cases where the same type of violations is covered under the EPA and the other law. In addition, criminal cases brought by SPCBs are difficult to prosecute, have a low conviction rate (although that varies greatly between states), and consume precious government resources and time.

Some SPCBs (Maharashtra, Andhra Pradesh and West Bengal) have started a bank guarantee system for defaulting industries as an instrument to ensure compliance. Under this system, a state board requires the non-complying firm to post a bank guarantee to ensure the implementation of corrective actions in accordance with the negotiated compliance schedule. Renewal of consent to

**Table 6: Capacity gap analysis: Penal provisions**

| Key tasks/functions | Competency required by the staff to perform the tasks/ functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/government level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| To execute/ cause to be executed in case of non compliance | Knowledge on building evidences<br><br>Knowledge of bank guarantees and market-based instruments | Protocol for implementation as well as forfeitures<br><br>Grievance redressal<br><br>Appellate authority | Policy at national level on bank guarantee/market-based instruments<br><br>Judicial scrutiny with respect to existing laws<br><br>Inter-state learning |

## AGENDA FOR DISCUSSION

**Should an SPCB be empowered to impose fines or penalties?**

**What amendment can be introduced in the law to curb non-compliance and impose stricter provisions for violations?**

**How can appeal and appellate authority be strengthened for redressal of grievances related to bank guarantees/fines?**

**Is there any provision for bringing market-based instruments under criminal law?**

**What are the views of industry on bank guarantee systems?**

operate is conditional on posting the guarantee. Normally, 10 per cent of the estimated total compliance cost is required as bank guarantee. If a firm fails to comply on time, the SPCB forfeits a portion or the entire bank guarantee for its discretionary use. There is no standard procedure to determine the amount of forfeiture, and the decision is made by the SPCB's chairperson.

The forfeiture is a powerful monetary penalty for a violator and a significant deterrent against future non-compliance. However, many issues related to the application of bank guarantees remain to be clarified: for instance, how can the penal amount be calculated, how should forfeitures be calculated and the revenues used, and whether supplementary collateral is required if the compliance schedule is extended. Most importantly, many boards believe that a bank guarantee is not allowed under existing laws and a legal clarification is required before it can be widely used.

The absence of a civil administrative authority (particularly, to impose administrative fines) limits the effectiveness of SPCBs' enforcement efforts and leads to over-reliance on the judiciary for enforcement. Filing criminal cases against violators in trial courts or reacting to PILs is a time-consuming, unpredictable and ineffective enforcement mechanism.

There is a recent trend in developing countries to introduced market-based. instruments (MBIs) to improve compliance. MBIs use price or such economic parameters to provide incentives for polluters to reduce pollution. Trading schemes are one of the most widely used market-based instruments. A trading scheme involves a binding target and a unit of trade. Trading schemes also distribute initial allotments to participants of the scheme. There is penalty in place for participants who do not comply with the rules. It also has a specific time limit for achieving the goals. From time to time, the participants have allowance to cover the emissions for that period. Participants are allowed to sell or buy the allowance based on their requirement. This is considered a cost-effective option. As there is a fixed cap, it is guaranteed that the emissions would not exceed the required norm. Market-based instruments create incentives for firms to adopt low-cost technological or process innovations for pollution control.

## 2. Data management, information dissemination and capacity building of stakeholders

The CPCB and SPCBs are entrusted with the task of data management, information dissemination and capacity building of stakeholders. The functions of SPCBs and CPCB with respect to mass communication and information dissemination can be divided into the following:

- Data generation and management
- Dissemination of information
- Mass awareness programme
- Public participation
- Capacity building of stakeholders

### Data generation and management

The pollution control boards generate large quantities of data every day, either online or manually. In order to handle this data, boards have initiated the use of information technology. The Gujarat Pollution Control Board took the lead in this and adopted a software called Extended Green Node (XGN) in 2008. The software is a two dimensional tool to bring transparency in the way GPCB works with industrial stakeholders in terms of data on individual facilities, consent management, and inspection reports. The success of XGN prompted other SPCBs to adopt the same software with improved features. The CPCB and some SPCBs (such as in Gujarat, Madhya Pradesh, Andhra Pradesh, Maharashtra and West Bengal) maintain database storage, retrieval and archive systems on paper as well as in the electronic form.

Many senior officers of SPCBs have accepted the constraints at individual level regarding dearth of skills in processing, analysing and publishing the data and presenting in a format which can be used for planning comprehensive environmental management programmes for the state. Officers are also not well versed with the usage of different softwares. Barring CPCB and GPCB, very few boards have taken the initiative to build the capacities of their staff on data collection, collation, processing, analysis and representation. Some boards are not fully computerised, compounding their problem in managing their data. In the absence of a comprehensive data management technique, SPCBs have become mere repositories of data without drawing meaningful inferences from it.

Quality assurance of data is another aspect which cannot be ignored, especially in the case of analysis done by laboratories. With several air quality, water quality, and noise monitoring stations installed in different states, various types of data is generated every minute. The data generated by a laboratory of an SPCB needs quality assurance and quality control to minimise errors. Data received by SPCBs from various sources also needs quality assurance. Erroneous data can lead to incorrect information, which may lead to wrong decisions. The staff engaged in data generation at SPCBs is usually not equipped with a knowledge of instrumentation and other factors such as site selection, meteorology etc in data collection. Officials also complain about the scarcity of infrastructure in data management. Unavailability of right gases for calibration, agencies and skilled humanpower is also a deterrent for good management of data. It has been observed that data generation and management for water pollution is better than that for air pollution. The guidelines and protocols for data collection, QA/QC is ample in the case of water quality

**AGENDA FOR DISCUSSION**

**How can vast volumes of data be put to use effectively?**

**How can data be digitised and stored?**

**How can SPCBs design quality assurance and control programmes?**

**Table 1: Capacity gap analysis: Data generation and management**

| Key tasks/functions | Competency required by the staff to perform the tasks/functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/government level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Data generation and digitisation<br><br>Data management (validation, storage, analyses, retrieval) | Skills in data collection, collation, processing, analysing and publishing the data and presenting in a format (statistics) which can be used for environmental management in the state<br><br>Knowledge of instrumentation, meteorology, site selection<br><br>Usage of different softwares<br><br>Quality assurance of data (calibration) | Data digitisation<br><br>Information technology division for data management – software + hardware;<br><br>Data centre<br><br>Laboratory<br><br>Quality assurance/quality control system (guidelines, proficiency test)<br><br>Quality assurance facility for air quality (primary and secondary)<br><br>Adequate human and financial resources<br><br>Protocol on quality assurance of air quality data<br><br>SOPs for data validation techniques | Recruitment of IT people (a provision in recruitment rules)<br><br>Create infrastructure (agencies to calibrate, gases, skilled humanpower) |

analysis, whereas they are not adequate for air quality data.

With the increase in work load, IT can be used as an important tool to ensure compliance.

### Dissemination of information

In 1982, the MoEF had established a programme called Environmental Information System (ENVIS). The focus of ENVIS has been on providing environmental information to decision makers, policy planners, scientists, engineers and research workers across the country. To meet its objective, the MoEF selected different institutes as data centres on specific parameters. For instance, the Indian Bureau of Mines was selected as a data centre for mining related information, the Botanical Survey of India for database on Indian plants, SPCBs for state-level environmental data, and the Institute for Ocean Management to be an information centre on coastal zone management. The SPCBs/PCCs of Bihar, Rajasthan, Tripura, Uttarakhand, Puducherry, Mizoram and Chhattisgarh, along with a number of state governments/UTs, are a part of the ENVIS network. At present, the network consists of a chain of 67 partners out of which 39 partnerships are on subject-specific and 28 on state/UT-related issues.

**Table 2: Capacity gap analysis: Dissemination of information**

| Key tasks/functions | Competency required by the staff to perform the tasks/ functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/government level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Publish technical reports<br><br>Prepare and publish annual reports<br><br>Disclosure of information to public<br><br>Provide specific information to citizens under Right to Information | Analytical and writing skills<br><br>Presentation skill<br><br>Develop public relations skills | Manage websites (frequent updation)<br><br>Skilled staff<br><br>Improved Information flow from regional to head office<br><br>Mechanism/system to collate information from various stakeholders<br><br>Strengthening of ENVIS/information centres (revisit the mandate)<br><br>Standard format for structuring reports<br><br>Timebound publication of annual reports (website)<br><br>Resources (finances, infrastructure)<br><br>Public relations cell | Building linkages/networks with stakeholders |

**AGENDA FOR DISCUSSION**

**What mechanisms can be adopted for dissemination and quick disclosure of information?**

**what level of discretion should spcbs follow for disclosing or not disclosing data on industrial matters?**

But the ENVIS centres of the SPCBs are not fulfilling the mandate they were envisioned for. The ENVIS newsletters of SPCBs contain basic information and are not updated on a regular basis. For instance, the ENVIS newsletter of the Chhattisgarh Environment Conservation Board (CECB) is just a collection of environmental news clippings from different newspapers and has not been updated since 2010. The newsletter of the Uttarakhand Environment Protection and Pollution Control Board (UEPPCB) has not been updated since 2008. The Bihar SPCB's ENVIS newsletter, apart from including state-specific information, contains textbook information on different environmental topics such as soil, air etc.. Apart from the newsletters, SPCBs have taken very few initiatives to disclose the information to the public. The data generated by SPCBs is seldom available in the public domain in its entirety. Their websites are mostly ill-designed, sparse and contain outdated information. A few boards do provide information on their websites, but navigation is a problem.

Another medium of information dissemination is the annual report, which is released by an SPCB at the end of the financial year. The copies of the annual report should be forwarded to the state government within four months from the last date of the previous financial year. However, the submission of annual reports of most of the boards usually gets delayed every year. According to a report by the Tata Institute of Social Sciences (TISS), the reason attributed for the delay in submitting annual reports is that these reports need to be certified by a competent authority. Except the Maharashtra Pollution Control Board,

none of the state boards have a statistical officer to compile data from the departments. Also, in many cases, the head offices of the PCB fail to get data from their regional offices in time to prepare the annual report in a time-bound manner. Some of the boards like those of Sikkim and Bihar have not published their annual reports since 2008. Unavailability of such documents reduces the information available in the public domain.

SPCBs are supposed to provide specific information to citizens under the Right to Information (RTI) Act, 2005. In the absence of a proper data management system, they face serious limitations in fulfilling these provisions effectively.

It has been observed that SPCBs either do not have the information in a usable form (and have no resources to systematise it) or are reluctant to provide it to the general public. There is also no uniform format for disclosure of information in the public domain. The information displayed on websites and annual reports of different boards show large variations. The PCBs of Maharashtra, Gujarat, Tamil Nadu, Odisha, Rajasthan and West Bengal provide significant amounts of information on their websites. This includes the number of industries, annual reports, executive summaries of EIA reports, publication lists, etc. On the other hand, the websites of Bihar, Haryana, Kerala, Goa and Punjab boards provide just the basic information about the board – functions, acts and forms for consent. The boards also have a skewed flow of information from the regional offices to the head offices which delays the publication of annual report or data transfer to CPCB.

### Mass awareness programme

An important function of the CPCB and SPCBs is to build capacities of stakeholders on environmental issues and involve them in the overall environmental management of their areas/states. The board usually carries out awareness programmes in the form of documentaries on television, chat shows on radio, eco-clubs in school, workshops, pamphlet distribution, and notices in newspapers and other mediums. The CPCB, in collaboration with the SPCBs and Doordarshan, has made a comprehensive programme called 'Paryawaran Darshan' in all the major languages of the country through various stations of Prasar Bharti. The CPCB has also broadcast a comprehensive programme in Hindi through the All India Radio (AIR), and made a few films on different topics in association with SPCBs. The SPCBs, time and again, publish notices in newspapers to make the masses aware of new rules and regulations. The WBPCB conducts international workshops annually on compliance and monitoring in order to increase the understanding of regulators and industry on international best practices. The TNPCB, OSPCB and JKSPCB have conducted workshops on roles and responsibilities of different stakeholders under the new e-waste rules.

A programme of raising a National Green Corps through eco-clubs was launched in 2001-02 by the MoEF. Under this programme, eco-clubs have been set up in 100 schools in each district of the country; 47,000 eco-clubs have been set up so far. The programme is being implemented in each state/UT through a nodal agency appointed by the state/UT government. The government of India provides financial assistance for establishment of eco-clubs at the rate of Rs 1,000 per eco-club, and for training of master trainers and teachers and distribution of resource material. Eco-clubs are a good way of spreading the environmental message by children who can be catalysts in promoting a mass movement. Not many SPCBs have been involved by the MoEF in establishing eco-clubs; but these are good tools for mass awareness which SPCBs can adopt.

**AGENDA FOR DISCUSSION**

**What strategies can be used for effective communication?**

**which, in your opinion, are the most important external target groups (Stakeholder analysis)?**

**what are the areas that need mass awareness?**

**can Eco-clubs be funded through CSR?**

**Table 3: Capacity gap analysis: Mass awareness programme**

| Key tasks/functions | Competency required by the staff to perform the tasks/functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/government level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Carry out awareness programmes<br><br>Communicate with different stakeholders and engage with them | Communication skill<br><br>Skill to design and carry out awareness programme<br><br>Skill to coordinate preparation of documentaries on television, chat shows on radio, eco-clubs in school, workshops, pamphlet distribution, notices in newspaper and several other mediums | Communication strategy<br>Strategy on how to engage with the stakeholders on a regular basis to bring about change<br><br>Public relations cell<br><br>Skilled staff<br><br>Financial resources<br><br>Mass awareness camps | |

The boards are embarking on new initiatives to communicate with different stakeholders and engage with them. Such initiatives are, however, inadequate and intermittent and there is no strategy in place on how to engage with the stakeholders on a regular basis to bring about change. The boards have also failed to increase their outreach and build public confidence. One of the main reasons for this is their poor communication strategy. It has been observed that the inaction of SPCBs gets highlighted in particular cases, whereas their good initiatives seldom get noticed.

The poor communication strategy of SPCBs is mainly due to lack of skilled personnel in carrying out the task. It is very important to aquaint stakeholders with the work done by SPCBs, for which communication experts are needed. Very few boards have a dedicated cell for charting strategies for communication.

### Public participation

Environmental management is influenced by and has impacts on a great variety of institutional stakeholders. An effective enforcement of environmental laws, legislations and rules requires an informed consensus that can be achieved by a good understanding of the shared roles and responsibilities of all the players, including the regulator, the regulated community (developers and polluters) and the affected community (general public).

Boards are criticised for devoting most of their attention to addressing the concerns of industry and giving less importance to the concerns of affected community. There are people who are directly affected by the pollution of their environment but they seldom have a say in the decision making.

State boards also have a procedure in place to address the complaints they receive. Public complaints are received through letters, fax messages, phone calls, e-mails and the press (media). Most of the SPCBs also have a complaint/grievance section on their websites. SPCBs give complaint redressal

## AGENDA FOR DISCUSSION

**What initiatives can the SPCBs take to enhance public participation in decision making?**

**Table 4: Capacity gap analysis: Public participation**

| Key tasks/functions | Competency required by the staff to perform the tasks/functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/government level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Address public grievances<br><br>Organise public hearings (in the context of EIA) | Sensitisation/motivation<br><br>Skill on PR/public engagement<br><br>Updated knowledge on acts/rules/guidelines on the public hearing<br><br>Skills of consensus building; stakeholder engagement/management ; public hearing | Transparent grievance/complaint redressal mechanism<br><br>Resources (human, financial, IT)<br><br>Include public in monitoring<br><br>Interactive websites | Policy to enforce transparent and time-bound redressal of complaints |

a priority in their vocation and claim to address most of the complaints they receive; however, stakeholders have always expressed unhappiness with the response of the boards.

There is little transparency in the complaints received by the boards. There is no information on how the complaints are processed and who is handling them. There is also no timeline given as to when the complaint will be addressed and what actions will be taken.

The reason for poor public engagement of SPCBs is mainly due to the lack of motivation among the staff to engage with the public in their jurisdiction. The boards consider it as an unnecessary exercise and preclude their participation in decision making. It has also been observed that the staff at SPCBs is not aware of the rules concerning public hearings. Very few boards display the proceedings on their websites and fewer make it available for public access.

### Capacity building of stakeholders

New rules and regulations are being implemented as a result of developments in the field of pollution. Updating the knowledge and improving the skills of the board officials is, therefore, an essential function of the boards.

As a primary responsibility of the boards, training and capacity building have been a major concern for long. Some of the boards have in-house training facilities which are used for conducting orientations, training programmes, selecting candidates for training programmes organised by different institutes etc. The TNPCB has developed a training centre called the Environmental Training Institute (ETI). It is headed by the chairperson of the board and is technically supported by an advisory committee with members from industries, private/public institutions and NGOs. The main objectives of this training centre are to improve the board's environmental management capacity, and create awareness. The target groups that the centre trains include staff members of the board, industries, NGOs and government organisations. SPCBs of states like Maharashtra, Gujarat, Bihar, Andhra Pradesh and West Bengal,

**AGENDA FOR DISCUSSION**

**How can SPCBs design a need-based training programme?**

**What initiatives can be taken by SPCBs to build the capacities of staff and other stakeholders on a regular basis?**

**How can training be linked with new responsibilities at SPCBs?**

**Table 5: Capacity gap analysis: Capacity building of stakeholders**

| Key tasks/functions | Competency required by the staff to perform the tasks/functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/government level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Design and deliver training programmes for persons engaged in pollution prevention | Skill to design and deliver need-based training and other capacity building inputs (exposure, study tours, workshops etc) | Training system<br><br>Strengthening the training cell<br><br>Training need assessment<br><br>Monitoring mechanism for training<br><br>Orientation programme<br><br>Refresher course after two-three years<br><br>Training linked with level of responsibilities<br><br>Visit success stories (specific sectors) | Linked with recruitment rules/HR policy |

that do not have an in-house facility for training, send their staff to other organisations.

It has been observed that very few boards conduct orientations for their newly recruited/junior staff. The staff at SPCBs also complain that the training programmes attended by them are mostly general in nature and do not address the specific needs of the boards. Also, it is often not possible for interested staff members to attend a training programme as the member secretary or -- in some cases -- the SPCB chairperson nominate the officials for attending the programme. There is a lack of clear-cut planning and strategy for capacity building and training among the boards. It has also been observed that there is seldom any follow-up with the staff member who has returned after training. Only a few SPCBs have a system of follow-ups, that includes submission of training reports, presentation by the participants on the learnings etc.

# 3. Planning, execution and advisory functions

The Central Pollution Control Board (CPCB) and the State Pollution Control Boards (SPCBs) have a specific and explicit advisory role with respect to prevention, control and abatement of air and water pollution. Sections 16 and 17 of the Water and Air Act mention that CPCB and SPCBs are to advise the Central and state governments respectively and plan and execute nation-wide programmes on the prevention, control and abatement of water and air pollution.

The planning, execution and advisory functions of the SPCBs incorporate the following broad agendas:

- Plan a comprehensive programme for prevention, control or abatement of pollution of streams and wells in the state, and for securing the execution.
- Plan and cause to be executed a state-wide programme for prevention, control and abatement of air pollution.
- Advise the state governments on any matter concerning the prevention, control or abatement of water and air pollution.
- Advise the state governments and Union territories with respect to the location of any industry whose operations might lead to the pollution of a stream or well (list of polluting industries).

### Planning and securing execution

To undertake planning for control and abatement of pollution, it is required that the SPCBs have a clear understanding of the pollution problems in their states. Approaching a problem would require identifying the problem, assessing the magnitude of pollution and preparing an action plan to prevent, control and abate it.

In 2011, the Comptroller and Auditor General (CAG) had carried out a performance audit on water pollution in India. Its findings pertaining to planning for control of pollution of rivers, lakes and groundwater were as follows:

- Compliance in terms of enumeration/identification/quantification of indicators has been dismal.
- Absence of a comprehensive inventory of rivers/lakes and keystone species associated with them, which form an important step in planning the control of pollution in aquatic resources, reflects deficiencies in the planning process.
- The risk assessment procedures of the Union ministry of environment and forests (MoEF)/CPCB and the states are deficient as they fail to carry out comprehensive identification and quantification of the human activities and various sources which affect water quality. No agency in the country has assessed the risks of polluted water in rivers/lakes/groundwater with respect to health and environment.

It was also mentioned in the CAG report that neither the MoEF nor the states have introduced any programmes to prevent pollution of groundwater. At the level of the states, implementation of the projects was unsatisfactory. Projects were delayed beyond the scheduled completion dates and many of them had not been completed, though they had been sanctioned more than five years back. The CAG report highlighted the capacity gaps state boards face in

**Table 1: Capacity gap analysis: Planning and securing execution**

| Key tasks/functions | Competency required by the staff to perform the tasks/functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/policy/government level for facilitating the boards to fulfill their mandate |
|---|---|---|---|
| Plan a comprehensive programme for the prevention, control or abatement of pollution of streams and wells in the state and to secure the execution<br><br>Plan and execute a nation-wide programme for the prevention, control or abatement of air pollution | Skills needed for preparation of pollution inventory<br><br>Knowledge of importance of planning and how to make a good plan<br><br>Knowledge of the tools for planning | State/national pollution inventory<br><br>Annual plans for carrying out priority activities<br><br>Association of experts | |

**AGENDA FOR DISCUSSION**

**Why have SPCBs failed to prepare a comprehensive plan to minimise environmental load in the states?**

planning for pollution control and abatement.

The major deterrent for proper planning at SPCBs is a lack of pollution inventory in the states. An inventory, identifying and quantifying the parameters of pollution levels in air, water and waste can help SPCBs make an action plan to control it. Interaction with senior SPCB officials reveals that they do not have the adequate know-how to make an inventory. Most of the SPCBs do not have an updated inventory of hazardous waste generated in their states; they are also struggling to prepare an inventory of e-waste in their states, leading to no or limited planning for e-waste management.

The CPCB and concerned SPCBs have identified 41 critically polluted/problem areas, action plans for which (including compliance monitoring measures) have been developed and are in various stages of implementation. Similarly, Urban Air Action Plans have been designed in 17 cities (out of 53 identified by the CPCB) where air quality exceeds the national ambient standards. Some SPCBs are also working to set priorities in keeping with annual plans that focus on highly polluting sectors, projects or activities. However, the number of such boards is very few; more SPCBs need to come forward to undertake such planning.

Execution of projects at the level of SPCBs has also been not up to the mark. It has been observed that initiating new projects at the level of an SPCB is fraught with red-tapism, resulting in late completion. For executing projects in a timely and proper manner, boards must have a forward looking plan complete with defined activities and a timeline. Absence of such planning can be attributed to a lack of skilled staff at the SPCBs for undertaking such activities. In the absence of a plan, it is difficult to execute any project.

### Advisory functions

Over the years, the CPCB has carried out its advisory functions jointly with SPCBs in different areas with the goal of improving air and water quality (see Table 2: *Advise and action*). In addition, the CPCB has also constituted a Research and Advisory Committee in 2002 comprising of experts from leading environmental laboratories of the CSIR, the Department of Science and Technology and the MoEF and other eminent scientists for guiding and reviewing the research activities of the organisation. The Research Advisory Committee has now been renamed as Research Advisory and Monitoring Committee (RAMC) and the composition has been expanded to include a wider range of stakeholders, such as representatives from agricultural and industrial sectors as well as service professionals and experts from government and non-government agencies. The RAMC oversees the research activities as per the guidelines of the Department of Scientific and Industrial Research, Union ministry of science and technology, and advises the CPCB regarding research to be undertaken.

While the CPCB has been fairly active in its advisory role, the SPCBs have carried out these functions in a limited capacity. The Gujarat Pollution Control Board (GPCB), for example, has recently appointed an expert to advise them on

**Table 2: Advise and action**

| Subject | Advisory by CPCB | Action taken |
|---|---|---|
| Basin, sub-basin studies | Ganga, Yamuna river cleaning | Ganga Action Plan |
| Water quality monitoring | Urban wastewater discharge | Yamuna Action Plan<br><br>National River Conservation Directorate (NRCD) |
| Air quality monitoring | Identified 150 polluted stretches | SPCBs asked to prepare action plan |
| Grossly polluting industries (1,400) | Identified 95 non-attainment cities | SPCBs asked to prepare action plans<br><br>Introduction of CNG in selected cities |
| Industries handling hazardous substances or discharging wastewater more than or equal to 100 kg BOD load to water bodies | Ensure compliance | Being implemented by SPCBs |
| 17 categories highly polluting (2,526) | Ensure compliance | Being implemented by SPCBs |
| Comprehensive Environmental Pollution Index (CEPI) | 43 industries | CPCB/SPCB monitoring the industries |

**Table 3: Capacity gap analysis: Advisory functions**

| Key tasks/functions | Competency required by the staff to perform the tasks/ functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/govern-ment level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Advise the state government on any matter concerning the prevention and control of water pollution<br><br>Advise the state government on any matter concerning the improvement of the quality of air and the prevention, control or abatement of air pollution | Skill on development of an action plan | Development of mechanism to identify the topics (public grievances)<br><br>Assessment study for remedial actions<br><br>Action plan/time-bound programme (target, indicators and responsibility)<br><br>Technical, financial and infrastructural support<br><br>Empanelment of experts | Involvement of concerned department of the state government and other relevant departments/academia/experts |

## Case study

### The Swedish Environmental Protection Agency sets an example in information disclosure and involving the public

The Swedish Parliament has adopted the National Environmental Quality Objectives covering different areas such as clean air, climate change, eutrophication etc, with the goal of addressing major environmental issues facing the country by the year 2020. There are three different layers to this plan. At the macro level, the Swedish government provides the overall direction to the environmental efforts, with 16 well defined objectives and 71 interim targets. Various tools and indicators have been developed to measure progress and data is collected on a regular basis by the Swedish Environmental Protection Agency (EPA). Public agencies, businesses and individuals also play a part in the exercise. This information forms the basis for government bills, introduction of new legislation, taxes or other changes in order to meet the objectives. Eight government agencies have been given responsibility for the different environmental quality objectives. They collaborate with various organisations and companies in their respective sectors in order to attain them. An All-Party Committee on Environmental Objectives also advises the government on strategies, policy instruments and measures to achieve these objectives. It consists of MPs, supported by experts and representatives from stakeholder organisations. The Committee engages in a broad public dialogue with researchers and relevant stakeholders.

This work is further supported by sub-national actors, such as county administrative boards and local authorities that coordinate regional efforts, including town planning, layout of roads and infrastructure etc. Environmental and other non-governmental organisations also contribute by shaping public opinion and fostering understanding of the need for change to meet the objectives. Through this initiative, the Swedish EPA has set a good example of information disclosure and engaging the general public to foster environmental protection in the country.

**AGENDA FOR DISCUSSION**

**What initiatives can SPCBs take to build capacities of their existing staff to identify major environmental challenges and develop action plans?**

development of an action plan for polluted river stretches in Gujarat. The Kerala State Pollution Control Board (KSPCB) has advised urban local bodies in the state on municipal solid waste management. These examples are, however, few and far between. Some of the primary reasons that prevent SPCBs from carrying out their advisory role in a more comprehensive and systematic manner are given below:

- Given the limited staff strength of SPCBs, critical functions such as enforcement and compliance gain prominence over advisory functions. Therefore, there is very little knowledge about the overall status of environment in the state. The CPCB, on the other hand, is relatively free from regulatory functions.
- The SPCB staff is usually not equipped with the knowledge and expertise to carry out advisory functions, such as the preparation of action plans. Although there is a provision for temporary association of experts (under Section 10 of the Water Act and Section 12 of the Air Act), the Boards generally do not have enough funds to hire such professionals. Very few boards have taken initiatives to involve experts to advise them on critical environmental issues facing the state.
- The action plans require superior project management skills to deliver outputs in a timely manner. In addition, they require involvement from other stakeholders and relevant departments since issues of air and water pollution cut across different sectors, such as transport, industry, agriculture and the public in general.

# 4. Research and development

Research and development is one of the core functions of Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs). It is important to pursue research to improve and ensure effectiveness in the performance of pollution control activities. Various projects have been undertaken by SPCBs with the cooperation of national and international research and financial agencies. Some of these projects incorporate development and expansion of laboratories, training of personnel, and establishing laboratory instruments and equipment.

The key research and development functions of CPCB and SPCBs are as follows:

- Provide technical assistance and guidance to the state boards, carry out and sponsor investigation and research relating to problems of water and air pollution, and for their prevention, control or abatement
- Encourage, conduct and participate in investigations and research relating to problems of water pollution and prevention, control or abatement of water pollution
- Prepare manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks and ducts
- Develop pollution control technologies
- Evolve economical and reliable methods of treatment of sewage and trade effluents, with regard to the peculiar conditions of solids, climate and water resources (of different regions) and especially, the prevailing flow characteristics of water in streams and wells
- Evolve methods of utilisation of sewage and suitable trade effluents in agriculture
- Evolve efficient methods of disposal of sewage and trade effluents on land

In order to carry out and sponsor investigation and research relating to prevention, control or abatement of water and air pollution, the CPCB has constituted a committee comprising eminent persons on the said subjects, in order to implement the legal obligations laid down under the Water and Air Acts. The following areas have been identified for this purpose:

- Modification and innovation of process technology to reduce pollution generation from sources
- To evolve economical and reliable methods of treatment of sewage/trade effluents and pollution control devices for air emissions
- To evolve methods of utilisation of sewage and trade effluents in agriculture
- To carry out/investigations on impact of pollution on human health/ecosystems
- Analytical techniques for measurements of pollutants

The CPCB works in collaboration with premier institutes in country. For instance, it has conducted reverberatory furnace modifications in collaboration with IIT-Delhi, bioseed development for BOD testing in collaboration with the Department of Biotechnology of the government of India, impact of air pollutants on human health in Delhi and Kolkata with the Chittranjan Cancer Institute, and cleaner technology H-acid and paracetamol production in collaboration with the National Chemical Laboratory, Pune. These ventures

## AGENDA FOR DISCUSSION

**How can R&D be encouraged and incentivized in the SPCBs?**

**How can the resource (financial and human) constraints for carrying out research be overcome?**

**How can SPCBs engage with other stakeholders and experts to promote R&D?**

**How can SPCBs create an enabling policy and institutional infrastructure to promote R&D?**

are, however, small in numbers considering the magnitude of work required.

There is immense scope for research and development at the state level. Major scope of research and development work at SPCBs lies with small and medium industries as most of them are operating with obsolete technologies causing pollution and loss of resources (raw material, energy). Some of the SPCBs also participate in impact assessment programmes and sponsor R&D works in order to improve the functions of small and medium scale industries. It is pertinent to maintain that many of the SPCBs and the CPCB have well-equipped laboratories to carry out research and development programmes, but unfortunately this function is done at a limited scale and magnitude because of limited humanpower. In addition, funds constraint is another limiting factor.

The second option is the health and ecological impact study. The CPCB carried out some of these studies and generated strong evidence with respect to some air/water pollutants. There is also a scope in carrying out research on reuse and recycling of solid waste, both hazardous and non-hazardous. The CPCB came out with guidelines on co-processing of hazardous wastes and later carried out trial runs at cement kilns and other industries across the country. A number of cement kilns in the country are now using hazardous wastes as alternate fuels and raw material (AFR), a major accomplishment in the sphere of research for pollution control boards. SPCBs are also promoting co-processing in their states by extending their technical expertise to industries willing to go for co-processing.

Another reason for low research output in the SPCBs is that with the addition of new spheres of activity, the technical skills have not been updated through retraining of officials, leading to a situation where SPCBs find themselves technically deficient in fulfilling their mandates under some of the newer laws and rules. There is a requirement for a dedicated technical excellence cell for carrying out research activities.

The quality of laboratories at SPCBs plays a vital role in carrying out research, monitoring and enforcement tasks. The CPCB laboratory at Delhi is equipped with sophisticated instruments and equipment for analysis of water, air, soil and solid wastes and is involved in many applied and experimental research activities besides routine monitoring, sampling and analysis. In addition to these, the CPCB laboratory carries out various R&D activities entrusted by government organisations (MoEF, the National River Conservation Directorate etc) in the country.

**Table 1: Capacity gap analysis: Capacity building of stakeholders**

| Key tasks/functions | Competency required by the staff to perform the tasks/functions | Institutional capacity required in boards to enable the staff (individuals) to perform mandated tasks/functions | What is needed at the system/ policy/government level for facilitating the boards to fulfill their mandate? |
|---|---|---|---|
| Carry out and sponsor, investigation and research relating to problems of water and air pollution, and for their prevention, control or abatement<br><br>Prepare manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks and ducts<br><br>Development of pollution control technologies; Economical and reliable methods of treatment sewage and trade effluents;<br><br>Evolve methods of utilization of sewage and suitable trade effluents in agriculture<br><br>Evolve efficient methods of disposal of sewage and trade effluents on land | Technical skill up-gradation<br><br>Staff motivation<br><br>Balancing routine functions and undertaking new research | Adequate skilled human and financial resources<br><br>State of the art laboratories in both the head quarter as well as regional offices<br><br>Collaboration with research organization and universities | National level policy on R&D<br><br>Guidelines on setting up of a dedicated state-level technical cell with representation from government and non-government experts and academicians |

However, the laboratories of most SPCBs, apart from laboratories at head offices, are crippled because of minimal resources and humanpower. For instance, the Bihar SPCB has one laboratory at its head office in Patna, but without adequate instruments, sampling vans, monitoring kits etc. The board has purchased a number of sophisticated instruments recently, but does not have the required expertise to use them. Most SPCBs lag behind in carrying out research due to the lack of skills among the technical staff. It has also been observed that senior environmental scientists of the boards are engaged in working in places other than these laboratories. This hampers the boards' responsibilities and research work.

SPCBs do not have adequate laboratories in their regional offices. The need for a laboratory at regional offices depends on the concentration of polluting industries in the jurisdiction of that RO. However, it would also depend on the financial resources of the board, and the humanpower it has for deputing in these laboratories. The CPCB has issued a guideline on the number and quality of laboratories required by state boards. Its implementation remains a question.

There have been instances in some of the boards where they have taken proactive steps to encourage officials/others to pursue R&D activities. The CPCB, in several cases, has allowed study leave to its officials to pursue R&D in different organisations; the CPCB paid their full salaries during their study leave. The Gujarat Pollution Control Board has also developed a comprehensive programme to allow researchers from different universities/organisations to carry out their research activities in GPCB. The GPCB holds the right to take decisions on the research topic of each researcher. All the researchers are provided workstations at GPCB head offices and allowed to use GPCB facilities. They are also paid scholarships. Such good practices need to be streamlined in all the SPCBs.

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