

III. Enabling Compliance in the Regulatory Environment

Building on a Sound Foundation

3.1 By any benchmark, India has an extensive environmental management system with a comprehensive set of environmental laws (Box 3.1), specific statutory mandates, regulatory instruments, and institutional frameworks to implement and enforce environmental policy objectives. Environmental legislation is on the national list. However, it involves a shared responsibility between the center and the States, with the central government having responsibility for policy and regulatory formulations and the State governments for ensuring implementation and enforcement of national policies and laws. At the central level, the Ministry of Environment and Forests (MoEF) and the Central Pollution Control Board (CPCB) are the nodal agencies responsible for environmental compliance and enforcement. Similarly at the State level, the State government Departments of Environment and Forest (DoE/DoF) and the State Pollution Control Boards (SPCB) are the designated agencies to perform these functions.

3.2 The main environmental management instruments include: (i) an *Environmental Impact Assessment* (EIA) system to regulate the siting and approval of large projects that requires the project proponent to prepare an EIA that is subject to *public hearing* near the project site and then is appraised and decided upon at the central level by the MoEF; (ii) *Forestry Clearances* that are processed separately by the DoF at both the State and central government levels, and require the project proponent to deposit the compensatory afforestation payment and the net present value (NPV) of diverted forest land with the DoF to obtain clearance; and (iii) the *Consent to Establish* (CTE) and *Consent to Operate* (CTO), issued by SPCBs, that regulate the establishment and operation of facilities at the State level. These vital “command and control” instruments are the principle foundations of any environmental regulatory system, and are supplemented with economic instruments and other incentives, such as matching grants for the common effluent treatment plants (CETP) or “green awards” introduced by most SPCBs.

3.3 Another key institutional actor for environmental enforcement in India is the judiciary that many would argue have filled a vacuum left by the regulatory agencies. Over the past decade, the courts have stepped in and developed a system of environmental jurisprudence, resulting in significant new policy mandates for both the public and private sectors. The legislation also requires updating to address new environmental risks.

3.4 Despite this strong policy and institutional framework, environmental degradation continues in many areas and public dissatisfaction with the situation grows. Sector reviews and case studies, lessons of international experience, and extensive consultation with various stakeholders during the course of this country environmental analysis highlighted three overarching themes (further discussed in this chapter), where actions must be taken to reverse the current trends: (i) aligning the regulatory framework with environmental pressures; (ii) strengthening the toolkit to promote environmental compliance; and (iii) matching regulatory capacity with regulatory mandates in a growing economy.

Box 3.1: Key Environmental Legislations in India — An Illustrative List

Policies

- 1992 Policy Statement on Abatement of Pollution
- 1992 National Conservation Strategy and Policy Statement on Environment and Development
- 1998 National Forest Policy
- 2002 Wildlife Conservation Strategy
- 2006 National Environment Policy

Environment Acts

- 1927 The Indian Forest Act
- 1972 The Indian Wildlife (Protection) Act (amended 1993)
- 1973 The Water (Prevention and Control of Pollution) Act (amended 1988)
- 1977 The Water (Prevention and Control of Pollution) Cess Act (amended 1992)
- 1980 The Forest (Conservation) Act (amended 1988)
- 1981 The Air (Prevention and Control of Pollution) Act (amended 1987)
- 1986 The Environment (Protection) Act (amended 1992)
- 1988 The Motor Vehicles Act
- 1991 The Public Liability Insurance Act (amended 1992)
- 1995 National Environment Tribunal Act
- 1996 National Environment Appellate Authority Act
- 2002 The Wild Life (Protection) Amendment Act T
- 2002 The Biological Diversity Act
- 2003 The Water (Prevention and Control of Pollution) Cess (Amendment) Act

Environment Rules

- 1986 The Environment (Protection) Rules
- 1989 Hazardous Wastes (Management and Handling) Rules
- 1990 Forest (Conservation) Rules (amended 1992)
- 1991 Chemical Accidents (Emergency Planning, Preparedness and Response) Rules
- 1998 The Bio-Medical Waste (Management and Handling) Rules
- 1999 The Recycled Plastics Manufacture and Usage (Amendment) Rules
- 2000 The Municipal Solid Wastes (Management and Handling) Rules
- 2000 The Hazardous Wastes (Management and Handling) Amendment Rules
- 2000 The Ozone Depleting Substances (Regulation and Control) Rules
- 2001 The Batteries (Management and Handling) Rules
- 2002 The Noise Pollution (Regulation and Control) (Amendment) Rules
- 2003 The Recycled Plastics Manufacture and Usage (Amendment) Rules
- 2003 Bio-Medical Waste (Management and Handling) (Amendment) Rules
- 2003 Forest (Conservation) Rules
- 2003 Draft Biological Diversity Rules

Environment Notifications

- 1994 Environmental Impact Assessment Notification 1994 (amended 2002)
- 1998 Constituting the Taj Trapezium Zone Pollution (Prevention and Control) Authority
- 1999 Fly Ash Notification

International Agreements to which India is a Signatory

- 1975 The Convention on International Trade in Endangered Species of flora and fauna (CITES)
- 1991 The Convention on Wetlands of International Importance (the Ram Sar Convention)
- 1992 The Framework Convention on Climate Change
- 1992 The Convention for Conservation of Biological Resources
- 1985 The Vienna Convention/Montreal Protocol on substances that deplete the ozone layer
- 1972 The Rio Declaration on Environment and Development and the Agenda 21

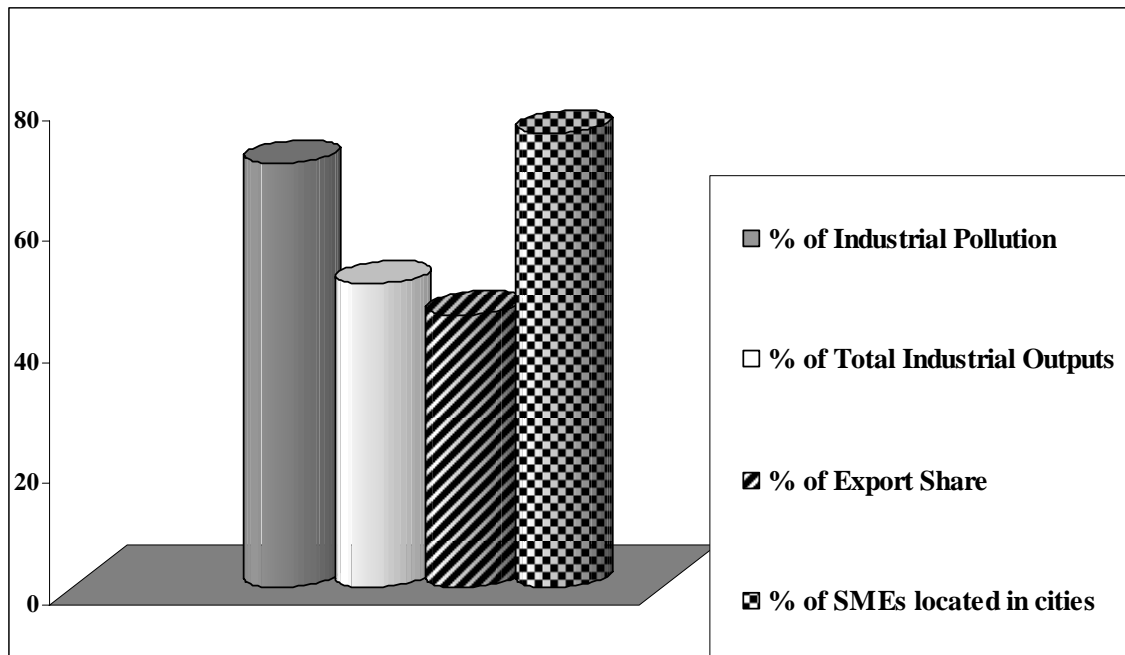
Aligning the Regulatory Framework with Environmental Pressures

3.5 One key conclusion of this country environmental analysis is that the current focus in applying environmental regulation does not match the scale and diversity of India's economy, with its multiple pollution sources, often outside the industrial sector, and is not responsive to changing priorities resulting from the country's accelerated growth. This necessitates: (i) exploring new regulatory programs and approaches, targeting different pollution sources; and (ii) exercising greater flexibility in applying regulatory standards, supported by sound economic analysis.

Expanding the Scope of Regulation to Cover Diverse Pollution Sources

3.6 **The Importance of Small and Medium Scale Industries.** Environmental problems, particularly in the "brown" sector, such as industry, energy and infrastructure, and urban development, have received increased public attention with the rapid growth in the country's economy in recent years. The regulatory focus has been on controlling the large and visible polluters, mainly large industries and power plants; but continued monitoring and enforcement of these large polluters is required. However, SMEs totaling to more than 4.5 million units, account for about 40 percent of industrial output in terms of value and estimated to contribute approximately 70 percent of the total industrial pollution load¹⁶ (Figure 3.1).

Figure 3.1: Importance of Small and Medium Scale Enterprises in India



3.7 The pollution generated from small scale industries is generally higher per unit of production than that of the corresponding large units partly because of the use of obsolete technologies and poor management practices, and partly because they do not come under the

¹⁶ Source: MoEF website, <http://www.envfor.nic.in/>

orbit of regulatory authorities. In the past, many SMEs, particularly those set up before the start of deregulation in the 1990s, fell outside the jurisdiction of either the local industrial authority or the SPCB and continues to be a problem today. The State governments and the SPCBs generally have not paid much attention to the pollution generated by these because of: (i) the difficulties in monitoring these units; (ii) the relatively high costs of pollution abatement for small units compared with large units; and (iii) the possible adverse impact of enforcing the standards on the output and employment of these industries, which are, cumulatively, the second largest employer in the country after agriculture.

3.8 While many SPCBs have relatively good records regarding the performance of the highly polluting units in the large scale sectors, the monitoring and inventory of small-scale units in the category of highly polluting processes is very poor and incomplete. In part, the lack of interdepartmental coordination between the SPCBs and the field units of the National Sample Survey Organization (NSSO) and Development Commissioner for Small Scale Industries (DCSSI) may result in the existence of some highly polluting units in the various States, which are not reported to the SPCBs. For example, in Gujarat, a few years ago there were approximately 1,600 large and medium size industries and 17,000 small enterprises, but only about 5,000 CTOs had been issued. In some States not all industries fall under the purview of the pollution control laws and consequently there is no record of them at SPCBs. SMEs should give more attention to resources to monitor and control pollution, particularly among SME clusters located in degraded watersheds and airsheds that are in close proximity to (sometimes mixed within) residential areas.

3.9 **Growing Importance of Municipal Sources.** In addition to expanding the mix of regulated industries to include small scale units, it is also important to recognize that industry is not always the biggest contributor to pollution in many of the receiving bodies (such as a river, or air in a large city). Municipal and domestic sources of pollution often pose a greater risk to public health and the health of an ecosystem, due to the large volume of untreated sewerage and domestic waste. Hospital waste and air pollution from transport, garbage burning, and even dust from poorly paved roads are other examples of pollution sources that increasingly compromise the effectiveness of pollution control and environmental management efforts by large industries. Therefore, it is important to understand the proportionate impact of the currently regulated sources on the ambient environmental quality compared to other sources on an area-wide basis, and design regulatory programs that target all major contributors to pollution in the area.

3.10 **Need for Different Regulatory Programs and Approaches.** Expanding the focus on additional sources will definitely necessitate looking at different regulatory programs, processes, and approaches, because both the nature of pollution/environmental impact and the nature of response/enforcement of these sources will be different compared to industrial point sources. For example, monitoring the large number of SMEs using the same protocol as for large industries units would be time and cost prohibitive for the SPCBs, and threatening to close a city hospital because of environmental violations would not be a viable enforcement option. In addition, different monitoring approaches may need to be considered for public versus private sector entities. For public entities, both generation and regulation of pollution rests with government agencies, which reduces the effectiveness of the regulatory program (as evident from experience of developing/transition economies with significant public sector) when accountability to the public is limited. Involving citizens in the monitoring of State and municipal facilities would make the regulation of public entities more transparent and effective.

3.11 **Dealing with SMEs Would Require Special Regulatory Programs** that focus on SME clusters in degraded areas and provide a comprehensive package of credible enforcement efforts (sometimes, following tightened regulations if the area environmental conditions require so) and extensive compliance assistance (discussed in more detail below). As the first step, an inventory of operating SMEs in the area should be conducted to determine how many are covered under the consent management system and how many are operating illegally or without environmental oversight. Environmental awareness and technical assistance programs, which are being increasingly provided to SMEs, need to be complemented by simplified monitoring programs suitable for SMEs and financial assistance, all together amounting to an effective package. To make the task feasible, further progress in devolution of monitoring and enforcement authority to local offices of SPCB and greater involvement of the local government and citizens in monitoring and enforcement, with corresponding capacity building would be required.

3.12 Similarly, different approaches (*vis-à-vis* the focus on monitoring single large units) are needed to address the multitude and diversity of sources in urban areas and heavily industrialized regions. One way is to expand on *an area based environmental management approach*, which has been tried in India since 1991 by the CPCB and SPCBs through eight different programs, including action plans for critically polluted areas, programs for environmentally sensitive areas, and city level urban air action plans (Table 3.1). The earliest application of this approach occurred during a crisis situation in the Singrauli region, depicted in Box 1.1. CPCB and respective SPSBs have also developed and are monitoring the implementation of the environmental action plans for the 24 critically polluted areas.

3.13 An advantage of the area-based approach is that it allows for a scientifically driven assessment to prioritize among multiple pollution sources, a consensus based stakeholder process to establish environmental and community goals, and the integration of diverse management options to address the cumulative impact on the ecosystem or water/airshed. In practice, the area-based (or integrated) pollution management approach has had mixed success in India and its application in other countries also had varied outcomes depending on the objectives and mechanisms for implementation. A review of India's experience undertaken by this study highlights several lessons: (i) involve a wider range of stakeholders in such programs, particularly better define the role of affected communities in the monitoring process; (ii) establish adequate performance indicators, linked to environmental quality improvements in the area, and not just to implement certain measures by individual polluters; (iii) strengthen oversight of implementation and incentives for polluters to complete the actions speedily; and (iv) ensure greater integration of area-wise sources in the program, including both non-point and point sources, industry and other sources, etc.

3.14 Some of the most successful international examples on area-based management include those where an appropriate coordinating "area-based" authority was established with adequate powers, such as river/lake basin or coastal zone management agency (e.g. Laguna Lake Development Authority in Philippines), or city-level air quality councils (e.g. Mexico). It is important to learn from these lessons, to assess the realistic potential and improve the effectiveness of this tool within the institutional framework for environmental management in India. In India, this approach would be more effective by linking with the decentralization process and local government agenda, strengthening the authority of municipalities and regional development authorities, and enabling them to facilitate integration of multiple sectoral strategies and stakeholders.

Action Plans for critically polluted/problem areas	This is the major area-based program in India. To date, 24 critically polluted/problem areas have been identified by the Central Pollution Control Board (CPCB) in consultation with the concerned State Pollution Control Boards (SPCBs), for which action plans are in various stages of implementation.
Programs for environmentally sensitive areas	The Ministry of Environment and Forests (MoEF) have issued notifications prohibiting or restricting location of industries, mining operations and other development activities with environments impacts in five environmentally sensitive areas.
Eco-city Program	The Eco-City Program has been initiated by the CPCB for environmental improvement in selected small and medium towns. In the first phase, it has been launched in four towns.
City level Urban Air Action Plans	The CPCB has identified 53 non-attainment cities where the air quality exceeds the prescribed ambient standards. The concerned State governments and SPCBs are required to prepare action plans for air pollution reduction in these cities. Several measures have been undertaken in recent years in Delhi; and action plans have been submitted for 16 other cities.
Areas with industrial clusters	Under this program, eight areas of concern due to the clusters of polluting industries (mostly tanneries and foundries but also drugs and pharmaceutical manufacturing units, and clusters of coal mining and coal based power stations) have been subjected to rigorous monitoring and pollution control initiatives.
Area wise Zoning Atlas for the siting of industries	To delineate the areas that suitable for industrial siting and for classification of areas in different categories based on their existing environmental profiles, the program for preparation of District-wise Zoning Atlas has been taken up by the CPCB in collaboration with the SPCBs (with Gesellschaft for Technische Zusammenarbeit (GTZ) support). In the first phase, 19 districts were taken up for preparation of the zoning atlas.
Area wise assimilative capacity assessment	A pilot program for assessing area wise assimilative capacity and exploring the feasibility of setting location specific standards was undertaken by the CPCB in the river stretch in Rajamundri and in the Vizag air shed area, Andhra Pradesh.
Area wise carrying capacity studies	Studies were undertaken in five selected areas of the country to assess the area wise carrying capacity over time, to assist with spatial planning and decision making with respect to industrial growth and other development activities based on environmental considerations.

Source: review commissioned by the study

3.15 Challenges of Monitoring Environmental Compliance by Linear Projects. There is an ongoing and anticipated massive expansion in construction with new highways, roads and transmission lines, often going through ecologically sensitive areas. Many of the environmental impacts as well as monitoring and enforcement procedures are not clear for these projects in the current regulation.

3.16 The nature of these linear projects is such that they extend over multiple ecological, social and administrative boundaries giving rise to cross sectoral and cross boundary impacts. The multiple administrative and regulatory jurisdictions add to the management challenge. Furthermore, these projects are mostly implemented by a consortium of entities, such as different contractors working on different stretches of the same transport or transmission corridor with varying construction practices. Though supervision and compliance monitoring may be through the same government implementing agency, due to the linear expanse of these projects, there are separate project management units along the way resulting in varying management practices and priorities leading to varying degrees of compliance.

3.17 Regulatory monitoring is mandated by the Air and Water Act and is to be enforced and monitored by the SPCBs per standards set by the CPCB. However, there are ambiguities in the application of these Acts. For example, these Acts are mostly applicable to point sources of pollution, which for highways construction comprises hot mix plants, batching plants or crushers and related noise, and effluent discharge. In the highways sector, projects which have received environmental clearances based upon their initial environmental impact assessment, often receive little attention from regulatory agencies on post-clearance monitoring during operation. As a result impacts, such as soil degradation, water resources modifications, impacts on bio-diversity, wildlife, cultural heritage and other landscape distortions that were addressed through the EA clearance process, are not monitored. One possible approach to address this gap of post-clearance monitoring, which emerged during consultation with the highways sector, is to introduce auditing of implementation practices in highways projects for identifying and promoting good practices. The concept of social auditing that has been successfully used in India and lessons learned from it could be adapted and applied in the environmental audit context.

3.18 In many instances multiple agencies are involved in related aspects of the projects, such as the regional office of MoEF for tree felling and compensatory afforestation, SPCBs for regulatory monitoring of Air and Water Act and conducting public hearings, and the State DOEs for monitoring MoEF and/or State imposed environment clearance conditions. This creates confusion regarding overall responsibility of project supervision. To improve enforcement of environmental requirements, the roles and responsibilities of each agency at the central and State levels with respect to the impacts that are to be monitored should be better defined and/or communicated to the developers.

3.19 Transmission lines do not require an EIA unless significant forest area lands are to be acquired. However, massive construction of transmission lines is expected in very sensitive areas to connect to major hydro power sources in the North-East and Himalayas, including sensitive and urban areas in the country that has the potential to affect the livelihood of people living in the right of way or affect biodiversity, forests corridors for wildlife, and other sensitive habitats. There are some examples that have involved habitat fragmentation and electrocution of elephants due to low voltage transmission lines and impacts on local village roads during transmission line stringing. It is therefore important to develop clear procedures and guidelines for dealing with environmental issues in the transmission sector.

Better Reflecting Source Diversity in Standard Setting

3.20 The regulatory framework in India does not permit any State government or SPCB to lower either ambient environmental quality or discharge standards fixed by the central government in any region. Some argue that these requirements should be rewritten to reflect the regional and local carrying capacities rather than a nation-wide concentration based standard. However, carrying capacity studies undertaken in India (Table 3.1) have concluded that setting area-differentiated ambient standards, based on local carrying capacities, would be too difficult to implement. In almost all countries, the national environmental standards represent the minimal baseline or floor in which to protect public health and the environment. States are allowed to adopt more stringent, not less, standards if greater protection of a regional or local natural resource is warranted. A way to reconcile these different perspectives and needs is to strengthen/expand the application of the land use or zoning concept in setting national standards.

3.21 Another concern expressed by many industry stakeholders is that national emission standards and discharge requirements for several industries are higher than what is possible to achieve considering the type of production process and technology, as well as the economies of scale. Addressing this concern is fundamental to improving compliance performance.

3.22 The current national environmental discharge standards in India are determined mainly on the basis of industry studies undertaken by technical institutions at the initiative of the CPCB. These studies assess available abatement technologies and provide tentative estimates of costs for different levels of abatement. However, while the CPCB studies look at the availability and costs of abatement technologies, they do not generally consider the impacts of these costs on a variety of sources, including smaller and/or older units, and the implications for the economy as a whole. One particular example from the power sector review is that concerning old, mostly publicly-owned coal power plants, some of which have been in gross non-compliance for years (Box 3.2).

**Box 3.2: Setting Feasible Emissions Standards in the Country-specific Context —
Lessons from India’s Coal Power Plants Story**

Source emission standards for Suspended Particulate Matter (SPM) from coal power plants in India — 150 $\mu\text{g}/\text{Nm}^3$ for generation capacity over 210 MW and 300 $\mu\text{g}/\text{Nm}^3$ for generation capacity under 210 MW — are consistent with international benchmarks. However, seven years after the notification introducing these standards (1998), over one-third of coal power plants are yet to comply with the national emissions standards (and 27 are yet to comply with the effluent standards). These plants are old, in poor shape and typically owned by cash-strapped state government utilities. Meeting the standards is not possible without a major and expensive Renovation and Modernization (R&M). Government of India has been implementing the R&M program for about 20 years; however, progress has slowed down in the past years, due to severe power shortages making it impossible to shutdown a plant generating cheap power for renovation.

A review of best international practice suggests that in this situation the environmental authority may wish to explicitly modify the requirements for certain sources, such as these old plants, based on transparent criteria, and/or extend the timeframe for meeting the standards, rather than allow a prolonged situation of non-compliance that erodes the credibility of a regulatory program and creates a “moral hazard” issue.

For example, the European Union Integrated Pollution Prevention and Control (IPPC) Directive for power plants requires that the permit conditions including emission limit values be determined on the basis of Best Available Techniques (BAT), which account for economic and technical viability of the plants. The Directive also provides flexibility by allowing licensing authorities, in determining permit conditions, to take into account: the technical characteristics of the plants, its geographical location, and the local environmental conditions. (Source: <http://ec.europa.eu/comm/environment/ippc/>)

3.23 It is thus reasonable and practical to build greater *flexibility in the procedure for setting and applying source standards* that would account for a diversity of pollution sources which all have different abilities to respond to the regulatory regime. International experience further shows that those countries where regulatory programs have worked well and compliance is good adopt new regulations after an economic impact assessment and/or substantive consultations with the affected industries.

3.24 There is an obvious value in strengthening the methodology for *an economic impact assessment of the proposed environmental standards/regulations* in India, including the impact on different segments of industries and the labor market. This should draw on best

practice international experience adjusted to the structure of the India's economy. Assessment of available technologies enhanced by sector-wide economic analysis would be a useful instrument for establishing the techno-economic viability of the prescribed standards. Updated standard setting procedures should also consider *differentiating between new and old sources, between larger and smaller units, and allowing a phased implementation schedule* that is sufficient to meet the requirements (which could be adjusted to different sources and locations). At the same time, regulations should be backed by *credible enforcement* sanctions for failure to meet new standards by the deadline, as well as provide *practical incentives* to facilitate compliance with new standards ahead of schedule (an approach often used by the European Union countries), or when local conditions dictate the need for an accelerated compliance schedule in an area.

3.25 These considerations are particularly important as India moves towards expanding the set of standards and regulations for industrial sources; for example, developing standards for hazardous pollutants emitted by a chemical industry. The diversity of India's industry needs to be recognized by the standard setting process, to avoid a continuous "moral hazard" from inability to enforce and comply.

Strengthening Toolkit to Promote Compliance

3.26 To meet the environmental standards/regulations the regulated community must have the *motivation* and *ability* to comply. In environmental management, motivation largely rests on effective enforcement (credible threat of a proportionate punishment); however, it can and should be also reinforced by incentives and rewards for "good behavior". The latter reduces the enforcement burden of the regulator and helps achieve the desired outcome (e.g. improved environmental compliance) at a lower cost to society. However, motivation will fall short of the target if the polluter has no knowledge, technology, or financial resources to take the action needed. Thus, an environmental regulator must develop a diverse toolkit, particularly for India's diverse economy, to address the needs and circumstances of the different players. This section highlights some (not all) possible areas of expanding the current toolkit that were identified as priorities in the analysis and consultations with stakeholders.

Packaging Compliance Assistance to SMEs

3.27 Shifting the focus on reducing pollution from SMEs emerged as a top priority. Lack of knowledge, access to technology and financial resources are all significant barriers to compliance by SMEs, especially among small-scale industries (SSI). Given these barriers and constraints, compliance assistance schemes are widely used for SMEs. For example, in Japan, the government owned Japan Environment Corporation provides financial support for the relocation of SMEs as well as low interest loans for purchasing pollution prevention equipment. In Taiwan, under the sponsorship of the Taiwan Industrial Development Bureau, low interest loans are offered to SMEs to implement waste minimization practices.

3.28 The MoEF, CPCB and SPCBs, in collaboration with industrial associations (such as CII) have programs to provide technical information to SMEs on different environmental technologies and alternative approaches to pollution prevention. The MoEF has also launched a centrally sponsored scheme for enabling the SSIs to set up pollution control equipment for treatment of effluents. The financial incentives included a central grant up to 25 percent of the total cost of the CETP on the condition that a matching grant is sanctioned and released

by the State government. The CETP companies are expected to meet the remaining cost by equity contribution by the industries and loans from financial institutions. This initiative has helped set up more than 90 CETPs, currently operating with varying degree of performance, for the management of effluents from clusters of SSIs. Similarly, under the Credit Linked Capital Subsidy Scheme, the Ministry of Small Scale Industry is providing assistance to small scale units for adopting cleaner production technologies and installing pollution control measures with financial support up to Rs. 10 million (US\$ 225,000) with 15 percent subsidy through the Small Industry Development Bank of India (SIDBI) and National Bank for Rural Development (NABARD). CPCB has also made an effort to develop pollution prevention guidelines and pilot demonstration projects, focused on SME clusters, with a view to providing lessons and the basis for wider replication.

3.29 The most successful programs for SSIs have involved a multi-pronged approach to compliance which incorporates a *complete package* of targeted regulation, a credible threat of enforcement, information dissemination, and technical and financial assistance to comply.

3.30 The West Bengal PCB has adopted such a program for a cluster of industries in Kolkata, which integrates tightening emission standards and focusing enforcement efforts with technical assistance and financial help (Box 3.3). Similarly, a “packaged” approach of combining regulation, enforcement, technical and financial assistance, including support with providing the gas infrastructure, has been applied in Agra, reportedly also with success.

Box 3.3: Cooperative Approach for SMEs — A Good Practice Example from Kolkata

Small scale industries were found to contribute 44 percent of the overall particulate emissions in a central area of Kolkata. The emissions largely came from the use of older, energy inefficient coal fired units for the manufacturing processes, such as small boilers, ceramic kilns, and cast iron foundries. The West Bengal PCB adopted a stricter particulate emission standard and intensified enforcement efforts targeting units located in that area. Most of the units using small coal fired boilers needed to change to an oil fired boiler (typically using a light oil) to meet the standard. To facilitate compliance, a fund was created at the WBPCB with the support of the India-Canada Environment Facility, to assist small scale industries in financing the cost of measures that would result in meeting the standard. Since a natural gas network is not available in Kolkata, a typical measure was to replace a coal boiler with a more energy efficient and cleaner oil fired boiler. The fund provided a matching grant (50 percent of capital cost) paid *after* the conversion was implemented. The WBPCB also involved industrial associations that helped to reach out to the units and provide technical advice. A recent assessment of pollutant emission reduction after the adoption of new standards and establishment of the fund showed a reduction of about 98 percent of the total particulate matter from the units who had completed the conversion from coal to oil fired units. The WBPCB program has many elements of best practice, such as using scientific information to set a regulatory priority and creating a targeted regulatory program, complemented by outreach, and technical and financial assistance, and building partnership with the regulated industry. (Source: <http://www.wbpcb.gov.in/>)

3.31 The success of well-packaged programs targeting SMEs and SSIs clusters lends itself for wider replication across India. It is important to systematically collect, review and disseminate information about such programs, as well as use this information and emerging lessons for initiating a *national program* for SMEs what would guide the design of suitable packages where there is a need, as well as provide matching grants for compliance assistance, building on the CETP initiative by the MoEF. For example, when air pollution is a key concern for a particular SME cluster that needs to be addressed by energy efficiency and/or

fuel switching measures, simultaneously resulting in reduced carbon dioxide emissions, it would be also useful to facilitate, as part of this program, access to carbon finance or other concessional global climate change financing instruments.

Strengthening Enforcement Deterrents

3.32 Need for Credible Enforcement Deterrents. In any regulatory situation, there will be some facilities that will voluntarily comply, some that will never comply, and a significant number of others who will only comply if they believe there is a sanction for noncompliance. Without a credible deterrent of enforcement, violators will not change their behavior and polluting conditions will continue. However, to be a credible deterrent, there must be a good chance that (i) violations will be detected, (ii) that the response to the violations will be swift, and (iii) the response will involve an appropriate sanction. Unfortunately, in India each of these conditions for a credible deterrent is lacking. Although the environmental laws and regulations are comprehensive and protective, there are some inherent procedural deficiencies related to the enforcement and prosecution of environmental violations. Technically, a SPCB has the legal authority to direct a polluting industry to shut down an offending factory, but this sanction is rarely used. Closure of a facility is associated with the loss of jobs and economic livelihood for the community, and therefore is viewed as a last step enforcement measure.

3.33 The SPCB also has the legal authority to file a criminal case against a violating company. While some SPCBs have filed criminal cases, the courts are frequently too busy with other criminal and civil cases that environmental cases get delayed for a long time before any action is taken. For example, in accordance with the Water Act, the SPCBs must file a case before the lower court for an action against a polluting unit and the “onus of proof” is vested with the Board. Unlike the Public Interest Litigations (PILs) which are filed in the Supreme Courts or High Courts, the lower courts do not seem to have enough time and interest in hearing environment related cases. Thousands of cases filed by the SPCBs have been pending in State courts for many years. In some cases where decisions have been taken, the polluting industries have been given the benefit of doubt because the Boards could not adequately meet the “onus of proof” test.

3.34 There are also cases where the polluters, even after conviction, have escaped penalties through legal maneuvers by highly paid advocates who plead their cases or because of corruption. Unlike some other countries where the pollution control authorities are empowered to impose fines depending on the nature and extent of pollution caused, the SPCBs have to approach the judiciary for this purpose. A recent United States Environment Protection Agency (USEPA) Report on Environmental Compliance and Enforcement in India found that “Seeking redress in the courts is time-consuming and resource-intensive, and further strains scarce government resources. In addition, the (criminal) cases are often unsuccessful, with 977 of the 7357 cases being dismissed by the courts or ultimately withdrawn by the Government.” (Miller, 2005).

3.35 As a result, regulatory agencies often choose not to pursue sanctions, because the available sanctions are either disproportionate to the environmental infraction or too time-consuming to pursue. Hence, in the absence of credible deterrence, many polluters continue to discharge illegally knowing that there will be no legal consequences. It has been reported that some industries have not installed effluent treatment plants or air pollution control,

because they do not believe there is sufficient reason (e.g., deterrent) to comply with environmental standards.

3.36 In some countries, environmental authorities, such as CPCB and SPCBs, have the authority to apply administrative penalty to ensure swifter enforcement actions and reduce the backlog of court cases. The authorities could also use administrative penalties collected as an additional source of revenue to support implementation and enforcement of environmental programs (see Box 3.4 for an example from US). However, using this relatively common instrument has been difficult for India's legal enforcement framework. In this context, a provision in the NEP (2006) that "a judicious mix of civil and criminal processes and sanctions will be employed in the legal regime of enforcement, through a review of the existing legislation" (MoEF, 2006, page 17) is a very encouraging and much needed development, which could greatly improve the credibility of the enforcement regime in the medium to long-term.

Box 3.4: Use of Administrative Enforcement Authorities as a Credible Deterrent

In the United States, the federal and state EPAs can issue an administrative order to resolve a violation without going to the courts for relief. Administrative orders are legally enforceable, provide evidence of the violation, and afford the violator due process and the opportunity to be heard. Under an administrative order, the violator will be required to take corrective actions with a prescribed time period, penalties may be assessed, and supplementary enforcement projects may be established. Where appropriate, the USEPA and state EPAs use administrative enforcement as their preferred first response for routine enforcement cases because it is viewed as more expedient than the judicial system. (Source: Miller, 2005)

3.37 **Exploring the Use of Alternative Enforcement Deterrents.** An alternative approach that can approximate the impact of an administrative sanction for certain polluters is the use of *environmental performance bonds*. A performance bond is a legal guarantee evidenced in a written document against any loss caused by the issuer's inability or refusal to perform previously agreed commitments and which result in significant impacts to the environment. It is a (contingent) payment which is triggered once an agreement is violated. The firm can either deposit the stated sum in an escrow account with the regulator, or more typically obtain a financial guarantee from a bank or financial institution, which is paid once the contract conditions are breached.

3.38 Environmental bonds are most useful in two circumstances: (i) where regulators lack the judicial authority or administrative capacity to impose proportionate and effective sanctions once an infringement has occurred; and (ii) for highly polluting and hazardous industries where firms can evade their environmental responsibilities by liquidating the enterprise. By imposing joint liability between the polluter and the guarantor, the bond lowers incentives to elude regulators through liquidation.

3.39 A common example is from the mining sector (in various countries, including Australia, Papua New Guinea, and United States) where a mine operator agrees to post a performance bond to cover the costs of re-vegetating and reclaiming the land, which has been the site of the mining operation. The bond is not released until the property is returned to its pre-mined state and if the site is not re-vegetated as required, the bond is forfeited to the regulatory agency. The legal and administrative precedent for the use of environmental bonds was first established in India when the Indian Bureau of Mines introduced a liability bond

where the mine proponent loses money or the bond for violating the approved mining closure plans (Rs 15,000/ha for small mines and Rs 20,000/ha for a major mineral mine).

3.40 Expanding the Bank Guarantee Program Based on Lessons of an Initial Phase.

A very encouraging example of this is the use of a bank guarantee program, being piloted in some States of India. Under this program, when a SPCB discovers a violation, it will require the violating company to post a bank guarantee to ensure that the company installs pollution controls according to the agreed upon compliance plan and schedule. Renewal of CTO is conditional on such a guarantee. If the violating company fails to meet the compliance agreement and schedule, a portion of the bank guarantee is forfeited and given to the SPCB for its discretionary use. The amount of the forfeiture is usually decided by the Chairman and Member Secretary of the SPCB. The West Bengal PCB has two examples of forfeiture for failure to meet the compliance schedule — a refinery forfeited Rs 500,000) of a Rs 1 million bank guarantee and a steel mill forfeited Rs 500,000 lakh of its Rs 2 million bank guarantee (Miller, 2005).

3.41 This initiative would be very useful to promptly conduct a careful evaluation to draw lessons for further replication. While expanding the use of the bank guarantee a number of additional advantages should be considered to strengthen the impact. First, an environmental performance bond gives the regulator flexibility in setting the sanction (payment) for violations. Thus, the “penalty” can be set at a level that is proportionate to the expected damage from violation. Second, it provides a financial incentive for firms to establish sound environmental credentials. This can be achieved when the price paid for the guarantee increases with the history of non-compliance. Third, it exposes polluters to further compliance pressures from a new actor, the guarantor, and so lowers the ability to circumvent regulations by colluding with environmental authorities. Fourth, it can be used proactively, rather than retrospectively, by being required for the issue for CTE and not only for renewing CTO. This approach would be particularly appropriate for high risk, hazardous processes.

3.42 As with any other regulatory instrument, environmental bonds are not appropriate in all circumstances. These are unsuitable for small enterprises, particularly in the informal sector that operate on small profit margins and lack access to credit. Conversely, large polluting industries as well as municipal facilities (e.g. hospitals and sewerage treatment plants) are well suited for the use of environmental bonds. This again reinforces the critical need for a judicious mix of instruments to effectively enforce compliance in the diverse Indian economy, highlighted by the NEP.

Augmenting the Use of Innovative Approaches and Incentives for Good Performance

3.43 India’s situation of legal difficulties with applying effective administrative sanctions lends itself to a greater use of innovative incentives. These instruments have been carefully reviewed by the CPCB and MoEF, with a sound conclusion to move ahead in a phased manner, starting with simple tools (Box 3.5). Once the bank guarantee system has been fully established, further expanding the toolkit by adding suitable economic instruments would be useful to consider. The opportunities provided by economic programs and instruments, such as Special Economic Zones or tariffs in external trade, should also be systematically assessed and used to encourage environmental improvements and investments.

3.44 Incentives need not be merely financial. Applying *regulatory flexibility* to companies using pollution prevention, waste minimization, and toxic substance use reduction strategies can also foster greater compliance.

3.45 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 formulations to stay competitive. They also have good compliance records. However, they do not report this change to the SPCBs as it would require seeking a new CTO. Companies who consistently meet or exceed the standards for compliance should be given the regulatory flexibility to modify their existing CTO if they agreed to certain parameters for improved environmental performance. In addition, the period of permit renewal for CTOs could be linked to compliance performance, extending the length of permits for stronger performing companies. This would reduce the burden of understaffed SPCBs and allow them to focus scarce resources on violators.

Box 3.5: Economic Instruments for Pollution Control: Potential for India

An international workshop on economic instruments for industrial pollution prevention and control was held in Delhi in June 2001. It brought together Indian and international experience with the application of economic instruments. The three-day workshop put forward a variety of tools used around the world, including pollution charges, tradable permits, performance bonds, and taxes on output and inputs, as well as the instruments of persuasion, such as public disclosures. The stories from countries as different as China, Columbia, Indonesia, Philippines, Thailand, United States and Vietnam were bridged with the current experience in India to generate the way forward to expanding the appropriate mix of instruments for India.

Several important messages emerged from the workshop. First, there was a consensus that the existing regulatory system in India needed to be strengthened by a greater use of incentives. Second, it was noted that for these instruments to work well in practice, sufficient attention should be given to the details of implementation, including the capacity of regulatory institutions, during the design stage. Third, the workshop concluded that a greater reliance on economic incentives should start with testing a simple instrument, consistent with India's legal and institutional framework for pollution management. Finally, the workshop recommended initiating the use of such an instrument on a pilot basis.

A recent introduction of the pilot bank guarantee program, a kind of performance bond instrument, for non-compliant industries is consistent with these recommendations.

(Source: Shrivastava, 2001)

3.46 There are a growing number of *voluntary incentives* by the industry to demonstrate environmental stewardship to company shareholders, consumers, communities, consumers, and other key stakeholders. Many companies in India and internationally have implemented the *Environmental Management Systems (EMS)*, such as *ISO 14001*, resulting in both economic and environmental benefits from improved performance and production efficiency. This is compelling many export-oriented firms, such as chemical manufacturing facilities in Gujarat or pharmaceuticals firms in Andhra Pradesh, to adopt voluntary initiatives to demonstrate corporate responsibility as well as sustained environmental performance beyond strict regulatory compliance. For example, the numerous export-oriented industries in Naroda are reportedly taking steps to improve their environmental compliance primarily driven by the export demand from their clients abroad.

3.47 In many countries, environmental regulators tend to support voluntary incentives by industry, so as to not create conditions that would discourage innovation as it seems to

sometimes happen in India. There are instances where successful voluntary agreements made between the industry and government to gradually improve environmental performance beyond compliance requirements have later been made mandatory and incorporated into law. One example is the agreement with the cement industries to improve their emission levels to 50 $\mu\text{g}/\text{Nm}^3$ from 100 $\mu\text{g}/\text{Nm}^3$ which is set to become a legal requirement in 2006. Some SPCBs have started requesting an ISO 14001 certificate from the 17 most polluting categories of industries before the renewal of their consents/authorizations. While this has reportedly led to better compliance, industry stakeholders consulted during the study mentioned that turning a voluntary agreement with individual companies into a mandatory requirement for the entire sector can be a disincentive for companies to explore voluntary initiatives in the future. In this respect, an approach adopted by the Gujarat PCB to provide incentives to industries implementing EMS, might be a good practice example to follow (Box 3.6).

Box 3.6: Promoting Environmental Management Systems

The Gujarat PCB has adopted a series of incentives to promote industries choosing to design and implement environmental management systems such as ISO 14001. These incentives include giving priority environmental approvals within a period of 45 days; extending the water consents from 5 years to 6 years; allowing units with ETP to be eligible for 25 percent fee rebated provided they do not exceed the water limits under their consent and meet the standards under the Water Act. In addition, the Gujarat PCB has promoted a series of industry specific guidelines for certain sectors such as aluminum, cement, chlor-alkali, pulp and paper under the Charter of Corporate Responsibility (Source: GPCB website, <http://gpcb.gov.in>)

3.48 The Naroda industrial estate in Gujarat also used an *environmental auditing* approach to improve their knowledge of resource utilization and generation of wastes. Under this approach, a facility would conduct a periodic and comprehensive evaluation of different management measures to achieve compliance including the development of a formal environmental compliance plan, environmental training programs for all employees; assessment of risks and costs posed by facility emissions and wastes; and, establishment of monitoring, recordkeeping, and reporting systems for internal and external audiences. In the United States, some State environmental agencies have sought to encourage environmental auditing by relaxing certain enforcement requirements for companies with proven and effective auditing programs. A similar approach could be adopted by SPCBs for companies with successful environmental auditing programs. Consent periods could be extended or inspection requirements could be lessened to promote environmental auditing.

3.49 Regulatory incentives can be also linked to the quality of *self monitoring and self reporting data*. According to the USEPA Report on Environmental Compliance and Enforcement in India, there is significant scope for improving the use of such data. Industries whose data are consistently validated by SPCB monitoring, for example, could be inspected with a lesser frequency than those whose data are not consistent with the inspection results.

Extending the Knowledge Base to the Regulated Community

3.50 A lack of knowledge was cited in the analytical review and case studies as an important reason for continued environmental degradation. There is a general consensus on the need to strengthen the quality and extent of environmental information that is made

available to all the sectors. Knowledge management involves information on the available technology to prevent, monitor, control, or clean up pollution, and on operation and correct maintenance.

3.51 There is also a need for a wider dissemination of basic information on environmental regulations, which provide clear answers to the following questions: What are the environmental requirements? Why are the environmental measures necessary? Who is subject to the requirements? When do they apply? How can they get into compliance? and, What are the consequences of non-compliance?

3.52 A substantial amount of information is already publicly available, and efforts are being made to facilitate and promote knowledge of modern technologies and practices. The Government of India has adopted a Policy Statement for Abatement of Pollution which provides several instruments to prevent pollution, including the adoption of a Life Cycle Assessment (LCA) for specific sectors to optimize the utilization and conservation of resources. A National Action Plan for Cleaner Production has also been drawn up to assist in developing and adopting cleaner production technologies¹⁷. However, it appears that the information does not reach out evenly across India, putting the less industrialized but rapidly industrializing areas at a disadvantage. There is a need, strongly endorsed by all stakeholders, to create and strengthen the network of regional environmental management centers, housed with the appropriate *existing* research and training institutions that would provide knowledge and training of the highest quality *comparable across States*.

Using the Power of Public Information and Pressure to Motivate Compliance

3.53 It is more likely that industry and project proponents will take corrective action when incidents of non-compliance are brought to the attention of the caring public. Public disclosure programs, pioneered by the Indonesia's PROPER program (Box 3.7), have proven to be a useful complementary tool in motivating industries to improve their environmental management and performance. In India, several green rating programs that rate the performance of various sectors or area clusters have been undertaken by the Confederation of Indian Industries (CII), Center for Science and Environment (CSE), and other organizations in India. With the adoption of India's Right to Information Act, the power of public disclosure is likely to be exercised more often and impose greater accountability on the industry and government for improved environmental performance.

Box 3.7: Expanding the Toolkit — the Power of Public Disclosure

The Indonesia Environmental Impact Management Agency established a highly successful public disclosure program known as PROPER (Program for Pollution Control, Evaluation, and Rating). The underlying premise of this program and the key to its success was the concept of creating incentives for compliance through "honor and shame." PROPER employs a color based rating system to rate the environmental performance of individuals plants based on compliance with water, air, and hazardous waste regulations, EIA requirements, quality of environmental management systems, resource management and use, and community development and relationship. The program has many benefits and many stakeholders: (i) for companies, it is a benchmarking tool to measure performance and a public relations tool to promote itself as an environmentally friendly company; (ii) for investors and financial institutions, it is a clearinghouse to evaluate company risks and performance; (iii) for the public, it is a tool to measure the company's compliance and government's enforcement record; and (iv) for the government, it is a tool to encourage companies beyond compliance and to identify performance weaknesses in key sectors and provinces. Public disclosure programs have recently been introduced in the Philippines, China, and Vietnam.

(Source. Afsah and others 1997; 2000)

3.54 A computerized State and national level information management system would also improve access to relevant compliance information. Ideally, the information management system should include specific information on compliance, such as required permits, compliance status, current and outstanding violations, corrective action plans, compliance schedules, and status of enforcement actions. The CPCB/SPCBs could use the information in the report to evaluate the performance of key sectors, analyze areas of compliance weaknesses, and target priority measures for improved enforcement.

3.55 As discussed in Chapter 2, the public can serve as an effective regulator in alerting government officials to violations and polluting conditions. It is important to continue supporting citizen monitoring efforts that CPCB/SPCBs have initiated by promoting public-private partnerships for compliance monitoring and establishing public notification procedures for sharing relevant data and analyses of environmental conditions, including the release of information concerning toxic and hazardous pollutant discharges.

3.56 Ultimately, it must be recognized that voluntary incentives, information disclosure and public participation alone cannot reverse the situation of widespread non-compliance. Effective regulatory programs and enforcement deterrents remain the foundation on which the culture of environmental compliance is built. However, these complementary tools can strengthen this foundation and facilitate compliance at lower enforcement cost so that a more robust and enduring structure can emerge.

Matching Regulatory Capacity with Regulatory Mandates in a Growing Economy

3.57 Even if all the recommendations listed above, such as creating additional compliance incentives and strengthening enforcement deterrents, were adopted, a major barrier to successful implementation would be the capacity of an environmental regulator to deliver on these initiatives. The regulatory agencies are already under-staffed and under-funded in meeting its existing obligations to implement regulatory mandates of various national and State laws and directives from the courts. A recent report by the Planning Commission concluded that the SPCBs are currently characterized by a dominant presence of non-technical staff, differential availability of staff for monitoring polluting industrial units, large staff vacancy positions, vast variations in financial positions, and prohibitive spending restrictions imposed by State governments (Planning Commission, 2005b). Not surprisingly, the report found that compliance of industrial units with the stipulated pollutant standards is poor. Overall nationwide compliance level is about 50 percent, while the situation is better — close on average to 80 percent — for highly polluting units, which have been the key focus of SPCBs.

3.58 The poor current capacity assessment by the Planning Commission and the adoption of more aggressive industrial promotion policies in many States has placed increased pressure on the SPCBs for a quicker turnaround of CTE and CTO and environmental clearances, notwithstanding that the volume and complexity of these requests are increasing while SPCBs resources remain unchanged. There is also a need for expanding the scope of regulation and introducing new regulatory programs and tools, as described above, to arrest continued environmental degradation.

3.59 Unless an increasing public demand for better performance by the environmental regulatory agencies is matched by adequate support to these agencies, conditioned on

institutional reforms to increase efficiency, transparency and accountability, it would be naive to expect substantial progress and unfair to solely blame the regulator for the lack of it. This section proposes a number of key actions which emerged as priority.

Making the Processes More Efficient

3.60 Given the staffing constraints that many SPCBs face and the growing demand for services, it is critical to maximize opportunities for rationalizing processes and upgrading technologies they rely on in their daily routine. The following areas have been highlighted by this country environmental analysis.

3.61 **Balancing Consent Management with Compliance and Enforcement Responsibilities.** SPCBs are the primary designated agencies to implement and enforce most of the environmental laws and regulations at the State level. Their responsibilities are vast — establishing pollution control programs for the State; issuing State-specific regulations for air, water, waste, and other environmental media; implementing the consent management system for CTE and CTO; managing the EIA system; addressing citizen complaints and educating the public on environmental issues; monitoring and ensuring facility compliance; and implementing court directives and developing State action plans. Of these responsibilities, a disproportionate amount of time is spent on the consent management system, because rapid industrial growth has led to increased demands for CTEs and CTOs and new infrastructure construction in the highways and power sectors. These increased demands have in turn mounted pressure on the SPCBs to process consents within prescribed deadlines. As a result, less time and emphasis is spent on monitoring and tracking compliance of existing facilities and pursuing enforcement actions against polluting facilities.

3.62 This trend in allocating time and effort needs to be reversed and better balanced. As the number of industrial units and infrastructure investments increase, so do the requirements for monitoring and actual enforcement of the provisions agreed in CTE/CTO. A way of rationalizing consent management, already adopted by several SPCBs, is to link the frequency of renewing CTO to environmental risk and past compliance/performance record of the facility. For example, consent periods could be extended (and inspection requirements could be lessened as well) for companies with successful environmental auditing and/or self-monitoring programs.

3.63 **Outsourcing of Non-core Technical Functions.** Not all regulatory functions need to be retained in-house and some may be performed more efficiently through contractual arrangements with private firms or NGOs. This would serve the dual purpose of providing needed support to SPCBs in fulfilling its mandate and using India's strong technological advances and technical expertise. For example, some monitoring and laboratory analysis functions could be outsourced to trained technical staff in research institutes or universities. Likewise, certain information management or data collection functions could be outsourced to information technology firms or linked to industrial association networks. In outsourcing regulatory functions, it will be important to establish guidelines that would ensure that the organization has no conflict of interest with a regulated entity and that quality assurance mechanisms are in place.

3.64 **Capitalizing on Advances in Monitoring Technology.** Many SPCBs currently rely on stack testing to monitor the compliance of the majority of industrial units. Continuous Emissions Monitoring (CEM) is an instrument that allows the accumulation of data at a pre-

determined time and over a longer period than the stack tests. The CEM can reduce the inspection burden on the regulatory agency by requiring the data to be self reported, or even by directly transmitting the reading results on a stack to a computer at the regulatory agency. Currently, online stack monitoring instruments are being provided to a very limited number of new large sources, such as new NTPC generation plants. Given the difficulties with CPCB/SPCBs staff positions, as well as public concern over possible corruption during on-site inspection, “leap-frogging” to a greater use of the CEM technology seems a particularly attractive option in India, and is currently being promoted by the CPCB. However, switching to CEM on a large scale would be expensive and needs to be phased-in. In addition, a strong quality assurance plan, along with the capacity to implement it well, is needed, which would include calibration checks and adjustments, record-keeping and reporting, and procedures for conducting periodic performance tests.

Strengthening Staff Resources and Skills

3.65 Ensure Adequate Staffing to Meet an Increasing Workload due to Rapid Growth. One of the main institutional challenges for regulatory agencies is about recruiting and maintaining qualified technical staff to perform mandated duties. Of the approximately 500 CPCB employees, only 120 technical staff are associated with environmental pollution control. In comparison, the China EPA has 1,647 employees of which 215 are assigned to environmental protection and 97 to monitoring centers¹⁸. The USEPA has 18,000 employees throughout the country. At the State level in India, which has the primary responsibility for most environmental responsibilities, many SPCBs are chronically under-staffed as indicated by vacancy ratios in Table 3.2.

State	Sanctioned Staff	Staff in position	No. of technical staff	No. of technical staff / Total number of staff) x 100	(Vacant posts/ sanctioned posts) x 100
Andhra Pradesh	4.72	3.11	1.17	37.61	34.08
Assam	-	-	-	47.21	3.43
Bihar	16.66	15.69	10.28	65.52	5.48
Goa	9.68	5.24	1.61	30.77	45.83
Gujarat	7.80	6.69	3.50	52.34	14.16
Haryana	12.37	8.59	2.16	25.14	30.62
Himachal Pradesh	52.65	44.25	11.50	26.00	15.97
Karnataka	22.19	7.77	4.47	57.48	64.97
Kerala	29.83	28.77	14.27	49.59	3.56
Madhya Pradesh	20.13	21.92	9.49	43.29	-8.87
Maharashtra	8.47	7.00	3.23	46.20	17.39
Orissa	21.05	15.31	5.84	38.13	27.27
Punjab	6.26	2.86	2.32	81.13	54.31
Rajasthan	9.93	9.09	3.89	42.72	8.44
Tamil Nadu	11.42	8.54	3.62	42.39	25.24
Uttar Pradesh	11.68	8.52	3.09	36.25	29.99
West Bengal	5.30	4.19	2.49	59.44	20.99
All Boards	10.73	8.10	3.70	45.69	24.46

Source: Planning Commission (2005b)

¹⁸ Source: China’s State Environmental Protection Administration website, <http://www.zhb.gov.cn/english/>

3.66 Many State governments, as part of the much needed reforms to promote fiscal discipline, have imposed indiscriminate hiring freezes on all government agencies, affecting the ability of SPCBs to fill vacancies and hire additional staff for the clearance and inspection process. This approach does not take into account that the workload involved in providing environmental clearances and performing compliance inspections is rapidly increasing due to the booming economy and unprecedented industrial growth in many places. As Table 3.2 shows, the number of SPCB staff in position per 100 polluting units greatly varies across States, with many SPCBs, particularly in more industrialized States, having alarmingly low ratios for total and technical staff.

3.67 As more States are set to experience rapid industrial growth, especially in pollution-intensive sectors (such as in Orissa), it is important for central and State environmental agencies to take up the issue with State governments, and agree on the need for *justified staffing plans for SPCBs* that would allow for some additional hiring, subject to making a strong case. The case should be made on the basis of *verifiable evidence* of increased workload (using past trends and near-term projections) and taking into account possible efficiency gains through improvements in processes and technology, discussed above. Ideally, a staffing plan should be an integral part of a broader capacity and efficiency enhancing plan (described below).

3.68 **Upgrading Skills.** The willingness to enforce compliance by regulators versus the willingness to ensure compliance by industries is subject to a well-known information asymmetry, resulting in a possibility for some polluters to misguide regulators based on their greater access and knowledge about the sources, magnitudes, and concentrations of pollutants. In this context, it is difficult to overemphasize the importance of constantly feeding SPCBs with state-of-the-art technical knowledge and equipping with resources for monitoring the polluting units, assessing the environmental data, and proper collection of evidence to prosecution of cases.

3.69 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 program for inspectors on general compliance and enforcement, but the number of training programs designed for specific compliance and enforcement issues is extremely limited. Even if training is provided, many inspectors do not receive the training because of travel or time constraints and training resource materials are scarce. There is also no national guidance on the minimum training and field requirements for an inspector or a centralized repository for training programs and materials (Miller, 2005).

3.70 To address this, the MoEF/CPCB would need to develop national guidance on minimum inspector training requirements and develop industry specific inspection manuals to be used by all SPCBs. The CPCB/SPCB should also consider collaborating with local universities to develop regular environmental curriculum and training for SPCBs and local governments. As more functions are delegated to the regional and local offices within the State, providing training at the local level becomes increasingly important.

3.71 **Building Legal Capacity of SPCB.** The CPCB/SPCBs are the prosecuting authorities in pollution control violations, as well as the target of an increasing number of law suites for failure to enforce compliance. This necessitates substantial legal expertise in

developing sound environmental cases for prosecution in the courts and in addressing PILs and the resulting judicial mandates. While the number of PILs and judicial mandates has grown over the years, little attention has been paid to building legal capacity and training. In addition, it has been increasingly difficult for SPCBs to prosecute cases, in part due to the lack of legal knowledge and enforcement resources to collect the necessary evidence to convict polluters. At the same time, the industry often has the resources — both legal and financial — to defend against protracted litigation or to negotiate a favorable settlement.

3.72 Ironically, the increasing number of PILs and court cases often results in further eroding the very capacity of SPCBs to inspect and enforce, as already limited staff resources are re-allocated to dealing with a high profile law suite. 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 a chain of custody, causation and harm, and procedural due process¹⁹, the number of highly qualified legal staff at the CPCB/SPCBs should also be increased or supplemented with contract attorneys. In addition, collaborative arrangements with local law schools should be explored to establish legal intern and law clinic programs that would help support enforcement efforts by CPCB/SPCBs.

Better Managing Financial Resources

3.73 With regard to financial resources management, SPCBs show varied levels of accomplishment depending on their reliance on government funds or availability of independent revenue sources, such as water cess. Other main sources of SPCB revenues are consent fees and other grants (Planning Commission, 2005b). The introduction of the enhanced water cess rates in 1996 has significantly changed the financial situation for SPCBs giving them additional sources of revenue for operating activities (and is an example of a success story in India's pollution management). However, while some SPCBs appear financially self-reliant, others still depend heavily on the State government for their operating expenditure which can potentially erode their independence in decision-making. Building capacity of SPCBs to raise their own financial resources (e.g. through a timely revision and proper levels of consent fees, or using a bank compliance guarantee program, in addition to water cess) *and* better allocate these resources by focusing on priorities, is an important area for moving forward.

Capacity Strengthening Action Plans for SPCBs

3.74 To coherently address the challenges and needs outlined above, MoEF/CPCB should request and guide SPCBs in developing a capacity upgrading action plan, following the State of the Environment reporting exercise, which establishes environmental priorities and trends in a State. These plans could use a common template (with a flexibility to adjust to particular circumstances) that might include the following areas: (i) developing and implementing a staffing plan, including specific measures to upgrade skills; (ii) developing and adopting tools for better and faster evaluation of environmental assessment of investments; (iii) rationalizing consent management based on environmental risks and re-allocating resources towards a more effective inspection and monitoring; (iv) decentralizing responsibilities to regional offices with the respective capacity upgrade in staff and equipment; (v) undertaking full computerization and Web-based management of application processing and monitoring; and (vi) introducing greater information disclosure and transparency in decision making,

¹⁹ Procedural due process is a legal term meaning that procedures for filing a case are followed fairly and according to the law.

including preparing to meet the requirements of the RTIA. An example of such a plan being developed for the Orissa Pollution Control Board is given in Box 3.8.

Building Capacity of Forest Departments to Perform Regulatory Function

3.75 While this analysis has primarily focused on CPCB/SPCBs, similar issues concerning the need to improve the efficiency of clearance and regulatory functions emerged for the DoF, particularly regarding the granting of forest clearances and conducting compensatory afforestation. Improving the forestry clearance system, as well as the accountability mechanisms in the compensatory afforestation process, was cited as a key issue for all developers, particularly in the hydropower, transmission and highways sectors. Specific recommendations include: (i) clarifying and rationalizing the complex forest clearance process by developing a handbook on classification and definition of forest areas and other land categories; (ii) updating the database of forest lands with forest maps and wildlife data; and (iii) reviewing the responsibilities and processes for compensatory afforestation, including an oversight system. Finally, there is a need for integrating the NPV payment for diverted forest land with compensatory afforestation within a consistent framework that (i) prevents double-counting of the cost inflicted on the developer; (ii) sets a reasonable economic value for the payment (see further discussion on the NPV in Chapter 4); and (iii) provides guidance on how to economically restore lost ecological and livelihood benefits.

Box 3.8: Proposed Capacity Building Action Plan for the Orissa Pollution Control Board

The Institutional Capacity Needs Assessment of Orissa Pollution Control Board has identified the following main capacity needs and action plan:

- **Consent management:** Redesign the consent management system with implementation at regional offices, expand the length of CTOs and streamline the processing time, prepare an inventory all operating industries and mines.
- **Compliance and enforcement:** Incorporate self monitoring, self reporting and record keeping requirements in CTO, finalize standardized monitoring and sampling protocols, train staff on legal issues and enforcement procedures.
- **Compliance assistance:** Insist on bank guarantees, blacklist non-compliant companies with financial institutions, promote self audits for compliant companies, create a compliance assistance hotline.
- **Public participation:** Train staff in communication and outreach skills, offer technical training to NGOs and civil society, develop public awareness campaigns on emerging growth sectors, establish a publicly accessible electronic database for EIA documents, and project status.
- **Staffing:** Develop and agree with the Finance Department a staffing plan including in house training programs and additional staffing needs to conduct the core functions in view of the increasing number of applications and inspections.

(Source: World Bank staff)

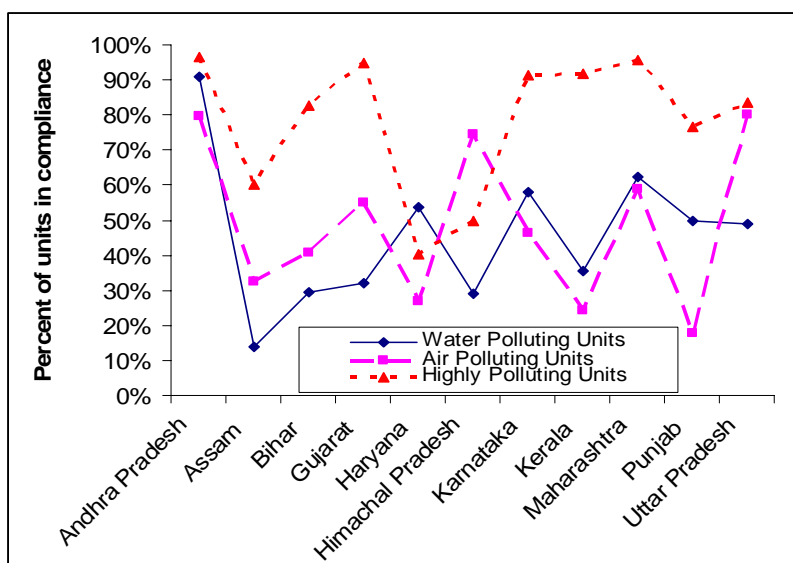
Strengthening Performance Oversight

3.76 While the States have primary responsibilities for implementing and enforcing environmental programs, the national nodal agencies for environmental enforcement — MoEF and CPCB — retain the responsibility to ensure that the national laws and regulations are being enforced by the States. The level of compliance and enforcement among the states is very uneven as shown in Figure 3.2. However, a system of oversight between the central

and State agencies appears weak and lacking *accountability* for the level of performance. Such an oversight function seems to have been assumed by the judiciary.

3.77 To strengthen the existing system of regular information exchange between the State and central level, the CPCB should establish oversight guidelines for the SPCBs which would detail requirements and procedures for reporting, information management, public disclosure, conflict resolution, etc. To ensure the institutional effectiveness and accountability of regulatory agencies, an agreed set of compliance and enforcement indicators and targets should also be included. These indicators would measure both outputs (e.g. the number of facilities inspected and the number of facilities in compliance), as well as outcomes (e.g. improved ambient water quality, reduced forest cover lost). Most of this data is already collected and made publicly available. Importantly, these indicators should be routinely used by CPCB/SPCBs to assess the effectiveness of existing programs and target staff and resources on priority areas; this type of mechanism is yet to be established. Given a large variation in SPCB performance, with some States apparently lacking an incentive and/or ability to improve, MoEF and CPCBs could also consider introducing a *performance-based* program of support to SPCBs, which will reward, for example, for exceeding the agreed targets, in addition to the *needs-based* technical assistance to SPCBs with particularly low capacity.

Figure 3.2: Status of Compliance Across Various States in India, 2003



Source: Planning Commission (2005b)

3.78 In conclusion, the agenda as outlined above for environmental agencies is of immense proportions. It necessitates a bold set of actions ranging from updating environmental laws, augmenting regulatory approaches, and refining enforcement strategies, to meet the existing and emerging challenges of rapid growth. As India's economy continues to accelerate and the demand for new development, roads, and energy increases, the performance of the environmental regulator will come under increased scrutiny and pressure. The needed institutional changes, however, cannot be achieved overnight (or even over a year), as many of the measures would involve further examination, design, and consultation with the public, other government agencies, and the regulated community. It is however important to move quickly towards a broad agreement with all major stakeholders on the

priority actions, based on the identified list, and develop a medium-term program of implementing the agreed measures, supported by necessary resources, monitorable targets, and clear accountability mechanisms.