

7 POLLUTION CONTROL STRATEGIES

Under traditional pollution control regimes depending on regulation, pollution that exceeds the legal limit is punishable by fines, plant shutdowns, or, in extreme cases, imprisonment of offending company managers. But such approaches require strong enforcement mechanisms: regulators have to monitor and analyze pollution from each plant, determine whether it has violated the rules, and institute legal proceedings in cases where the violation is clear. These steps are not cheap, and many developing countries have not been able to implement them. The inability to enforce regulations due to weak enforcement mechanisms and the supporting institutional environment (legal issues, interagency coordination problems, ill equipped and overburdened regulators etc.) makes a strict or efficient regulation regime somewhat impractical. What's more, such a system requires every commercial enterprise to toe the same regulatory line regardless of cost.

In an effort to break out of this one-size-fits-all approach, many countries are opting for more flexible and efficient regulations that nevertheless provide strong incentives for polluters to change their ways. Varied strategies have been used by different countries ranging from pollution charges to public disclosure programs that pressurise polluters to clean up their act.

The evolution of pollution control strategies has been described below:



Figure 10: Pollution Control Strategies

The key approaches that will be covered are:

1. Pollution charges (with or without some kind of traditional regulation)
2. Market driven pollution control (pollution credits, the threat of market reaction to adverse publicity, etc.)



3. Information driven pollution control (involving communities, media etc.)

7.1 POLLUTION CHARGES - THE “POLLUTER PAYS” PRINCIPLE

Its governing maxim is simple: All polluters’ towns, factories, and farms must pay for each unit of pollution they discharge into the environment. Pollution charges level the economic playing field by confronting all managers with the same price for each unit of pollution. Under such a system, managers are free to adjust their operations until they have minimized pollution related costs i.e., charges plus the cost of abatement. This system minimizes overall abatement costs while providing the right incentives for managers to clean up. A pollution charge not only cuts emissions but generates public revenue as well, even then, only a small fraction of the charge’s value as a lifesaving policy tool.

Yet at first glance a charge system looks unnecessarily complicated. Why not just require all factories to cut back pollution by the same uniform percentage until overall pollution falls to the desired level? That system could also work, but it would penalize factories heavily with high marginal abatement costs. As with traditional regulations, effective monitoring and enforcement of pollution charges can also be costly and time consuming. Claims from industry representatives about the excessive cost of regulation may be sympathetically heard by high-level policymakers who are not informed about the benefits of controlling pollution. And arguments against charging for illegal pollution are also common on the ground that criminal acts should be punished, not merely subjected to fees.

The “golden rule” $MAC = MSD$ (set pollution charges so that marginal abatement cost = marginal social damage) provides a good framework for determining environmental goals and pollution charges; in the real world the actual levels are determined through the political process. Concrete information about lives lost, fisheries destroyed, and other damages can play some role, but it will never be the sole determining factor. Policymakers have to seek a consensus on environmental goals and then use the available regulatory instruments to pursue them.

In the 1970s, economists William Baumol and Wallace Oates wrote a classic book showing how pollution charges could be adapted to these political realities. They recommended a four-step approach:



Institutional Capacity Building - MPCB

1. Determine environmental quality goals
2. Estimate the pollution reduction required by these goals
3. Estimate the marginal cost of abatement at the desired level of pollution
4. Set the pollution charge equal to the estimated marginal cost.

If the estimate is right, pollution should fall to the desired level. If it is wrong (if there is too little abatement) the charge can be raised.

Requirements for building a credible pollution charges system based on flexible enforcement

Enforcement should vary in approaches followed with local circumstances. Such community-level flexibility in administering national regulations is probably critical to continued support for either charges or standards in countries with highly varied environmental, social, and economic conditions. The variation in the charges applied for pollution will be a function of two factors:

- 1) The first is the price a community places on pollution damage, which varies with the total amount of pollution, the size of the exposed population, and local income per capita.
- 2) The second is a community's capacity to understand and act on local environmental problems, which is influenced by its level of information, education, and bargaining power.

Building support

Political realities indicate that industry has to support any charge system, and this support has proved contingent on four conditions. First, industry has to be convinced that the government is serious about environmental protection. Second, industrialists need credible evidence that pollution control will not bankrupt them. Third, plant managers tend to support charge systems once they understand that these systems give them great flexibility. They can abate or pay, as their conditions warrant. The fourth condition relates to how the charge revenues are used. Industry will refuse to support charges until they are guaranteed that the revenues will be used to finance public or private waste-treatment projects in their own area.



Technical Foundations

To maintain a credible charge system, regulators must obtain reliable data on plant-level emissions. This requires the ability to audit emissions records, enter and store data, and analyze variations in effluent samples from each plant. Regulators also need good procedures for collecting and accounting for charge funds. These are stiff requirements, and many agencies are not capable of meeting them. In practice, regulators are solving their information and auditing problems by using subcontractors. In Colombia, for example, regulators rely on reports from bonded auditors to analyze emissions. The regulatory agency has also subcontracted fee collection and financial accounting to Colombia's largest commercial bank, which receives a fixed percentage of the revenue flow. This solution has a triple advantage: The bank has the right experience to operate such a system, it knows how to collect debts, and failure to pay these debts can threaten a firm's credit rating.

7.2 POWER OF THE MARKET

The environmental concerns of market agents create additional incentives for pollution control. Green consumers are already well known, but investors have also become important actors. A high level of pollution intensity may signal to investors that a firm's production process is inefficient. Investors also weigh potential financial losses from regulatory penalties and liability settlements. The importance of such scrutiny has grown with the rise of new stock markets and international financial instruments: Capital markets may revalue a firm in response to bad news about its environmental performance. News of good environmental performance or investment in cleaner technologies, on the other hand, can enhance a firm's expected profitability and thus its stock value. Several studies have confirmed that U.S. and Canadian stock markets react significantly to environmental news.

World Bank researchers recently undertook a large-scale study of the impact of environmental news on stock prices in Argentina, Chile, Mexico, and Philippines. None of the four countries has a strong record of enforcing environmental regulations. Nevertheless, the study found that stock prices rise when authorities publicize good environmental performance and fall in response to publicity surrounding citizens' complaints.

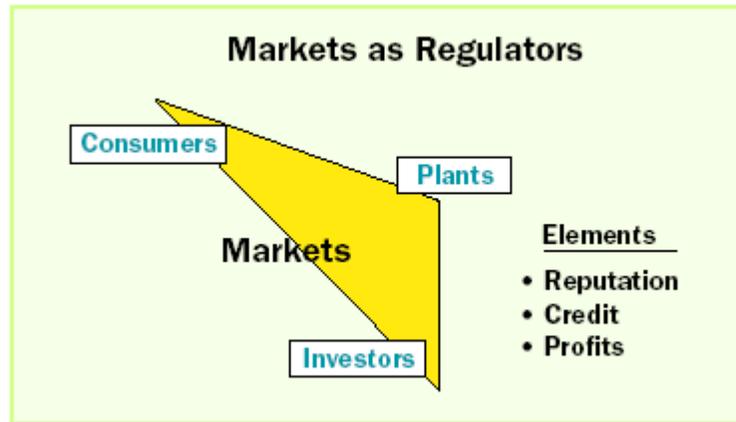


Figure 11: Markets as Regulators

Overall, the message is clear: Capital markets everywhere are taking information about environmental performance into account, and firms are responding by cleaning up. Another powerful market influence has been exerted by the International Standards Organization through publication of ISO 14001, its most recent business performance standard. For the first time, this ISO standard includes explicit norms for environmental management. Hundreds of developing-country firms have already made the changes necessary to qualify for ISO 14001 certification. In Mexico, a recent study shows that even small enterprises seek ISO 14001 certification if they are interested in subcontracting relationships with large, ISO-certified enterprises.

Once the roles of communities and markets are introduced, we have a much more robust model for explaining variations in polluters' behavior. Even where formal regulation is weak or absent, pressure applied through these new channels can significantly increase a plant's expected penalties for polluting. Polluters will react by reducing emissions, just as if government inspectors were enforcing regulatory standards.

Regulators still play an important part in controlling pollution, but their role is no longer confined to establishing and enforcing standards or charges. Instead, regulators gain leverage through programs designed to provide concrete information to communities and markets.



7.3 EVOLVING POLLUTION CONTROL MODELS

The proliferation of these new formal and informal channels is effectively creating a new model for pollution control. In this model, regulation is much more information intensive and transparent. As an environmental agency exerts influence through numerous channels, it becomes more like a mediator and less like a dictator. Community representatives take their place at the negotiating table along with regulators and factory managers. Market agents make their presence felt as well, through decisions by consumers, bankers and stockholders.

This model involves information as a vehicle for involving the community as an active participant in the regulatory process. The environmental agencies need to marshal reliable information, educate the public about environmental tradeoffs, and encourage broad participation in setting goals. It has been seen in Mexico that communities that participate in regulation would support its objectives, provide information about local polluters and would defend the environment agency against political attack.

The new model empowers policymakers because it gives them many options for improving industry's environmental performance. But the model also imposes new responsibilities : for strategic thinking about the benefits and costs of pollution control; a strong commitment to public education and participation; intelligent, focused use of information technology; and a willingness to adopt new approaches such as pollution charges and public disclosure.

Key to Success

Pollution Control Agencies like MPCB need to marshal reliable information, educate the public about environmental tradeoffs, and encourage broad participation in setting goals. Communities that participate in regulation will support its objectives, provide information about local polluters, and defend the environmental agency against political attack.

Good relations with business leaders are crucial as well, since industry associations often have the political clout to veto pollution-control programs. Regulators will find natural allies among CEOs of firms whose market position depends on good environmental performance. Having already paid for cleaner production, these leaders will support measures that require similar efforts from their competitors. Regulators can encourage informal regulation by publishing reliable, easily understood information on pollution sources and their impacts.

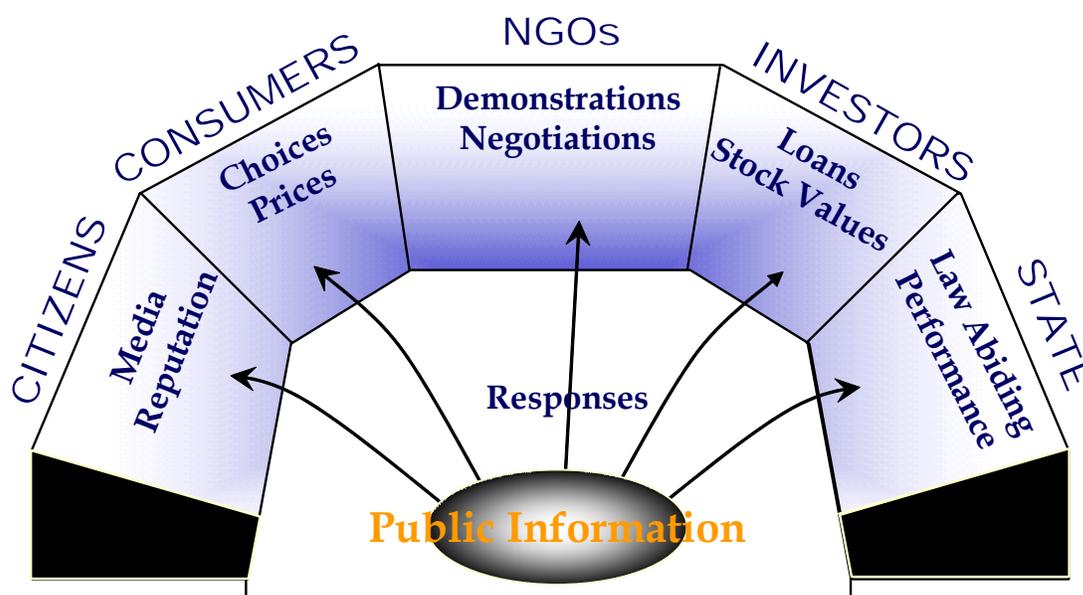


Figure 12: Key to successes – various players



8 STRATEGIC REVIEW - FINDINGS

The current role of MPCB is to regulate and enforce the various pollution control legislations. However, it is not able to carry out this role effectively due to serious corruption and inherent organizational weaknesses like lack of resources and systems. While capacity building would help add resources and improve systems, it would not be of much use in resolving the issue of corruption. To resolve these inherent issues, we have tried to arrive at different strategic approaches based on international and national best practices and discussions with the stakeholders that MPCB needs to adopt.

8.1 NEED FOR ROLE ENHANCEMENT

MPCB has been playing the role of a policing agency in pollution control matters. This has been ineffective in reducing pollution not only due to corruption but also because the present approach merely involves the levy of penalties. This approach merely punishes the polluters but does not lead to abatement of pollution.

It has been observed internationally that regulating all pollutants under all conditions is neither economically defensible nor politically sustainable. Regulators have limited skills and resources, and they will rapidly lose political support if the public regards them as sloppy, unfair or ill informed. Developing countries are using formal and informal channels effectively as a new model for pollution control.

As an environmental agency exerts influence through numerous channels, it becomes more like a mediator and less like a dictator. This model involves a high level of community involvement. The new model empowers policymakers because it gives them many options for improving industry's environmental performance.

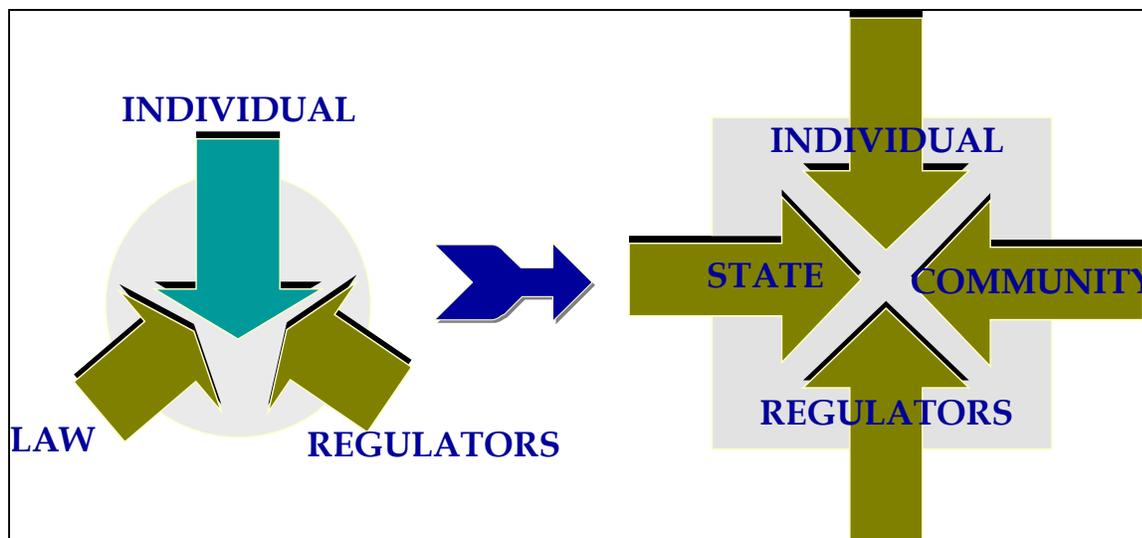


Figure 13: Transition needed

But the model also imposes new responsibilities:

- * For strategic thinking about the benefits and costs of pollution control;
- * A strong commitment to public education and participation;
- * Intelligent, focused use of information technology.

The new model empowers policymakers because it gives them many options for improving industry's environmental performance.

There is a requirement for a role change for MPCB as follows:

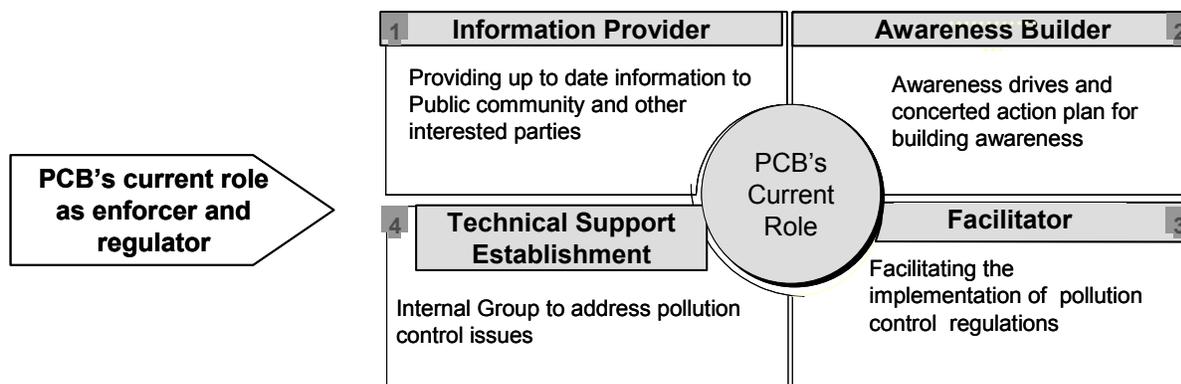


Figure 14: Changing role



8.1.1 Information provider

Information has been used as a powerful tool for pollution control in various countries. Provided information about polluting industries to the relevant groups like NGOs, community, lenders etc. would put in additional pressures on the polluting company and forcing it to take remedial measures. It has been observed that industries do indulge in a lot of self-regulation when faced with censure from societal institutions. This would be more effective than mere levying of penalties.

Indonesia is a classic example of how public disclosure has helped in curbing pollution.

In Indonesia, the enforcement of pollution control by BAPEDAL - the national pollution control agency - was weak because the regulatory budget was limited and the courts were plagued by corruption. Faced with this predicament, BAPEDAL decided to initiate a program for rating and publicly disclosing the environmental performance of Indonesian factories. The program that ensued is called PROPER— Program for Pollution Control, Evaluation and Rating. In the pilot phase of PROPER, which began in early 1995, BAPEDAL rated water pollution from 187 plants. Initial ratings showed that two-thirds of the plants had failed to comply with Indonesian regulations.

In June 1995, Tri Sutrisno Indonesia's Vice President presided over a high-profile public ceremony to congratulate the five green-ranked plants whose performance met formal requirements. BAPEDAL also privately notified other plants of their ratings and gave the non-compliant ones six months to clean up before full public disclosure. A scramble ensued and by December striking changes had already occurred. The serious violators were the first ones to react. Even before public disclosure, PROPER had scored considerable success! In December 1995, BAPEDAL delivered on its commitment to full disclosure, releasing ratings by industry groups over several months in order to hold media attention. By December 1996—one year later—improvements had become much more pronounced. Compliant plants, originally one-third of the sample, now constituted over one half.

How and whom would the information help?

Relevant constituents	How would the information help	Flipside	Actions to be taken
Consumers	May choose eco-friendly products	Indian consumers being price conscious, eco-friendliness would not be a primary criterion for product selection	Launching awareness campaigns through road shows and other publicity measures
Lenders	May cancel or withdraw sanctions given to polluting agencies	In the competitive banking industry, such actions would not be effective unless taken together by all banks	Working with banks and associations to initiate measures towards such regulations
Citizens	Enforcing the legal right to a clean environment	Enforcement mechanisms are difficult	Lot of emphasis on public involvement is the need of the hour
NGOs	Putting collective pressure on the defaulting company for better environment management		



8.1.2 Awareness Builder

Awareness level about pollution is much lower in India when compared to those in developed international countries. Only a well aware community has the potential to inspire public action against the pollution. There is a need to spread awareness about pollution among the community especially school children. Awareness could be generated through road shows, distributing pamphlets, short films, advertisements, awards for the best performers etc. In India, the percentage share of advertisement, publicity and awareness generation expenses in overall expenditure is quite low. Some states like Goa have taken a number of awareness generation initiatives such as film shows, exhibitions, trade fairs, workshops, etc. States like Kerala and Karnataka have instituted “pollution control” awards. Such initiatives could also be taken by MPCB for generating awareness. Education of the public about the key sources of pollution and its harmful effects will be a necessary activity of the Board going forward. A well-informed public is more sensitive to pollution related issues and will appreciate the work being done by the Board. It can also act as a counter to political pressure, if any, because politicians themselves want to be seen as trying to fulfill the wishes of the people.

Educating the media is another skill that MPCB needs to develop as part of its shift to information-driven regulation, and even otherwise. As of now, MPCB’s media strategy is more reactive in nature. For MPCB’s cause a more pro-active strategy involving the media by informing them about the work being done to control pollution, and the sort of obstacles that are being faced.

8.1.3 Facilitator and Technical Support Establishment

MPCB needs to play a greater role in facilitating pollution control rather than regulating and monitoring the levels of pollution. MPCB needs to provide information and also help in implementing pollution control measures. Currently this is not happening due to two reasons:

- MPCB perceives itself as a regulator rather than as a facilitator
- MPCB does not have the technical capability to develop and implement pollution control measures.



Institutional Capacity Building - MPCB

There is a need for an in house Centre for Excellence, which could develop standards and pollution control measures for various industries and would assist the industries in implementing pollution control regulations wherever necessary.

8.1.4 “Role Enhancement.” and “Role Change”

We propose strategy based in role enhancement rather than role change for MPCB to help it perform its role better.

British Columbia’s experience

In British Columbia, the Ministry of Environment is the nodal agency for environment protection. In 1990, the MOE took some tough steps of tightening the standards and using legal action against violators. The MoE also published twice a year a list giving the names of firms that do not comply with the existing regulations or whose environmental performance was of concern to MOE. The results of both types of action on the paper and pulp industry based on an empirical investigation of a sample covering 15 plants were analysed over the period 1987-1996. Two types of pollutants were considered: BOD and TSS. The results showed that a tightening up of the standards in 1990 had a very significant impact on plants' environmental performance and that than appearance on the polluters' list led plants to improve their environmental performance. Furthermore, the impact of appearing on a polluters’ list was stronger than that of fines.

MPCB may also adopt a similar strategy wherein while strengthening its current system, it may also look at introducing a proactive information dissemination system.

8.1.5 Interlinkages with other organizations

MPCB currently has been given full responsibility for enforcing certain legislations like the Water and Air Acts and also part responsibility for certain legislations like the Municipal Solid Waste Rules and the Hazardous Waste Rules. In the case of the MSW Rule, the primary responsibility of enforcing them rests with municipal corporations and ULBs. Currently there are no joint efforts from these organizations; each is working independently. MPCB has also charge sheeted local bodies when they have not implemented the legislation. Instead of penalising the ULBs however there is a need to empathise with them and work jointly with them rather than go in for pollution control measures.



8.2 KEY IMPERATIVES FOR MPCB

In order to enhance their role and provide more policy advice, the key imperatives for MPCB would be:

Creating a reliable database:

In order to be more information intensive, MPCB needs to create a reliable database of information. MPCB being a regulatory body is privy to a wide range of information. Hence it is in the best position to provide information on polluters, the nature of pollutants, action taken so far against pollution, information on companies that have managed to reduce pollution to a large extent, and information on how to reduce pollution and protect the environment.

Strengthening technical set up:

In order to be a technical support provider and facilitator, MPCB needs to set up R & D cells to provide guidance to internal staff on investigative research. Further, it may set up or assist in setting up an industry research centre which would do research on pollution abatement techniques. Efforts need to be taken to reduce pollution generation through devising newer production techniques rather than investing in waste disposal and waste storage facilities. MPCB may also explore options of working with external agencies like UNDP, UNEP, WHO, etc. for setting up and implementing pilot projects.

Adaptive instruments:

The current regulation mechanism carried out by MPCB is quite rigid and doesn't provide any flexibility to the industries for pollution control. A little flexibility in timelines, processes and regulations would be very beneficial to the industry. While setting deadlines for the implementation of pollution control, MPCB could provide for some kind of phased implementation plan over 2-3 years instead of specifying a date for compliance.



Institutional Capacity Building - MPCB

Community involvement:

Currently there is not much involvement of the community in pollution control. Further there is also not much awareness amongst the public regarding pollution control. For effective implementation of pollution control legislations and information based strategy, community involvement is very much necessary and hence MPCB needs to take measures for involving the community in pollution control, spreading awareness amongst the community through local community education and public awareness programmes.

Structured learning:

The functions and responsibilities of MPCB have been increasing with newer legislations getting added. However, its employees have not been adequately trained to handle these new legislations. Further, in the regulatory system of pollution control, the employees need to be trained on investigative R & D so as to enable them to perform their regulatory functions more efficiently.

8.3 ROLE OF NGOS IN ENVIRONMENTAL MANAGEMENT

The enactment of statutes on pollution control and the experience gained in implementation of the various provisions of these Acts over more than two decades, has indicated that the Govt. machinery alone cannot effectively cope up with the task of pollution control unless supported by the masses. The need for participation of masses in achieving the targets committed in the Policy Statement for Abatement of Pollution has been strongly felt. Public interest litigations have successfully demonstrated that responsible and concerned NGOs and public spirited individuals can bring about significant pressure on polluting industries for adopting pollution control measures.

NGOs being one of the most effective media to reach the people these days and may play a significant role in this regard. NGOs are assisting State Pollution Control Boards to a greater extent in providing first hand information and generating mass awareness with regard to control of pollution and can function better in this field in the following ways :

- By conducting preliminary surveys of river and air pollution control area for identification of any pollution source.



Institutional Capacity Building - MPCB

- By keeping a vigil on abstraction of water/discharge of sewage or trade effluent by any industry in quantity in relation to flow/volume.
- By conducting sampling and analysis of river/well water to ascertain their quality.
- By providing information regarding the entry of any poisonous, noxious or polluting matter into any stream or well or on land or in air.
- By maintaining a vigil against pollution in the surrounding environment, river, well, land and air and reporting to State Board/Central Board, if found any.
- By providing information on whether any river stretch requires prohibition on its use for disposal of polluting matters through a notification under Section 24 of the Water Act.
- By providing information regarding violation of consent such as discharges from units at odd hours etc.
- By publishing the minimum height of the stack/chimney prescribed for the industry/industrial operation, etc. and the ambient air and ambient water standards.
- By publishing notified restricted areas in which certain industries, industrial operations etc., shall not be carried out or shall be carried out subject to certain safeguards.
- By providing information on fish kill or other sudden damages to the environment not noticed by the Board.

8.4 ROLE OF PROFESSIONALS

Many of the functions in the pollution control procedure are technical in nature. In the initial stages of pollution control, the pollutants were largely industrial units. This has since changed and today the domain of MPCB covers several generators including hospitals, battery recyclers and urban local bodies. Many of these generators are not well versed with the technical aspects of pollution control.

Adding internal resources in line with the enlarging domain is not sustainable for MPCB. For the new areas it is desirable that MPCB involve external resources. Pollutants such as hospitals (bio medical waste), local bodies (solid waste and sewerage) and service industries (E-Waste) do not have the technical capacity for conformance. It is inevitable that they rely on professionals (consultants, equipment providers etc). Such professionals can also play the role of assurers for MPCB. Since they facilitate the pollutants to achieve conformance, a select group of these



Institutional Capacity Building - MPCB

professionals can also be empanelled/ accredited by MPCB as assurers of conformance. Based on their objective report about the pollutant, MPCB may be able to issue the necessary approvals. This will reduce the pressure on MPCB's resources.

Agencies such as ISO, Securities Exchange Board of India (SEBI), and Greater Noida Development Authority have already introduced such involvement of professionals in the regulatory role. Implementation of this would call for a system to accredit a limited number of professional agencies.



9 ORGANISATIONAL REVIEW - FINDINGS

The key findings under organization review have been clubbed under the following broad headings:

9.1 ORGANISATIONAL ISSUES

The meetings with MPCB officials revealed that the biggest concern on their minds were those related to Manpower issues. The main concerns expressed were:

- Manpower strength has not kept pace with the increase in MPCB's responsibilities. The staff feels that they are overburdened and that the Board should have autonomy with respect to induction of fresh staff as per the organization's requirements.
- With the addition of new spheres of activity, the technical skills have not been updated through retraining etc. leading to a situation where as of today, MPCB finds itself technically deficient in fulfilling its mandate under some of the newer laws and rules
- Technical Staff are underpaid, particularly vis-à-vis the CPCB staff
- The lack of promotional avenues has led to demoralization of staff. The current structure leaves little scope for promotional opportunities for the staff and as per the MPCB officials, people who spend their entire professional life with the organization might end up getting barely one or two promotions. Even though MPCB is a scientific / technical organization time scale promotion as available in CSIR & other scientific bodies is not available.
- The composition of the staff has changed over a period of time. Where MPCB staff earlier was mainly technical with high educational qualifications, it today gravitates towards a mix where the support staff dominates the technical staff. This shift needs to be corrected and reversed
- The role of the MPCB staff is multi disciplinary in nature. The same needs to be recognized and skills need to be developed.



Institutional Capacity Building - MPCB

- MPCB needs to prepare a detailed HR development program to impart environment management and engineering skills to the technical and support staff. Training will be essential to keep them in synch with the emerging technologies.
- Training needs of the staff has been neglected over a period of time leading to weakening of skill levels of the staff. Given the fact that the role of the MPCB staff has changed substantially with the change in MPCB's responsibilities, training is a continuous requirement and needs to be given serious attention. Institutionalization of training is required for undertaking sustained training programmes
- The areas where the staff needs to be trained are:
 - Environmental impact assessment
 - Use of computers- data entry, data accessing, data processing etc.
 - Managing effluent treatment
 - Air pollution control
 - Hazardous waste management
 - Geographic Information Systems
 - Managing disasters and spills
 - Sampling techniques
 - Environmental economics and planning
 - Preparation and evaluation of environment management plans
 - Environmental quality monitoring
 - Given the fact that interaction (as well as negotiation) with the public and industry is an implicit part of the MPCB office bearers job, training on personality development and PR skills is also a necessity besides the technical skills
- For the support staff, training is essential in sampling, operational analysis of ETPs, air pollution control, waste characterization and environmental instrumentation
- The administrative staff needs to be retrained in computers, graphics, GIS so that they can be converted to technical support staff



Institutional Capacity Building - MPCB

- Lack of incentives based on performance is missing. This leads to difficulties in motivating staff to perform

Solutions like outsourcing, use of IT to reduce duplication, standardization and simplification of processes could be explored. These measures should lead to a reduction in the problems related to workload and manpower shortage to some extent. However, other issues like training needs, incentivization, skill development, promotional opportunities etc. will still remain and will need to be addressed.

Currently there are around 650 employees. The technical and scientific staff comprise of around 45% of the total staff. The remaining staff is comprised of non-technical staff. On a comparison with other PCBs, MPCB's grading pattern is skewed in favour of the non-technical staff as seen from the table below:

The technical and scientific staff of MPCB is less than 50 % of the total organization strength. Further MPCB has also filled up most of its sanctioned positions while PCBs like Karnataka have filled up only 34% of the sanctioned positions.

	Gujarat	Karnataka	Maharashtra
Technical Staff as % of total staff	20%	47%	34%
Scientific staff as % of total staff	31%	17%	11%
Total scientific & Technical Staff	52%	64%	45%
Actual as % of sanctioned staff		34%	91%

Table 1: Comparison across States



9.2 IT REQUIREMENTS

As of now the level of computerization in MPCB is very low. Inventorization of data has not been done to build relevant databases and the staffs are not well trained to make good use of computers even if the databases were there.

Building a robust, intelligent and flexible IT infrastructure should be one of the biggest prerogatives for MPCB as it is one measure that can have the largest possible impact on MPCB's performance in the short as well as long run. While the scope of improvements that can accrue from appropriate usage of IT is virtually unlimited some of the key benefits that we foresee emanating from a well built IT system are:

Internal Operational Efficiencies

Right now there is a lot of repetitive filling and movement of documents across various departments. A streamlined IT system can tackle this and cut down the workload of MPCB's overstretched manpower significantly. It will also cut down the time required for processing applications and approvals substantially.

Tracking of Defaulters

An integrated database can allow MPCB to track down defaulters by comparing data across time periods. This information efficiency is likely to have a deterrent effect on defaulters as they realize the improvements in MPCB's processes. ABC kind of classification within the IT system will allow MPCB to target the "RED" industries on a priority basis.

Automatic Enforcement Triggers

Automatic triggers can be built into the software application linked to the database which will recommend enforcement action against a particular defaulter on meeting a certain criteria (e.g. - non payment of previous two periods' fees).

Generation of Timely Bills

Computerization reduces a lot of the repetitive and manual work involved in issuing bills and will certainly improve performance on this parameter.



Institutional Capacity Building - MPCB

Better Service to Citizens

Computerization can also improve the MPCB's performance in terms of the quality of service it provides to the end users i.e. the citizens and industry. It has been generally observed that public bodies which have been able to successfully implement computerization are perceived by citizens to be more responsive in reacting to citizens' complaints and grievances. Computerization also leads to increased transparency and accountability.

Generation of MIS

Another important benefit of computerization is that it can be used to generate MIS which can be used by the MPCB administration in day to day decision making and in long term planning. It can be also be used to monitor the success of MPCB's efforts in achieving long term targets which it may set for itself. A good information base will also lead to better decision making at the top.

Collection and Dissemination of Information

This remains one of the key mandates of MPCB and adequate work is not being done as of now. IT systems are the best means to fulfill this task and are vastly superior systems for dealing with info. For dissemination of information, a web based presence is the simplest and most efficient delivery medium.

Communities, Markets driven Pollution Control

As the previous section has detailed the pollution control mechanism has moved from a heavy regulation based one to one where the communities and markets play a significant part. We believe that over a period of time, MPCB will also move towards a mechanism where involvement of public and communities will be significantly greater than what it is today. A good information base remains the backbone of these regulation philosophies and hence strengthening the Information collection and dissemination mechanism will become even more important for MPCB going forward.



Institutional Capacity Building - MPCB

Information Flow

A well-networked system will lead to Information Symmetry between the HO, RO level offices. The same information will be visible to all MPCB personnel whether they sit in the HO or in the RO. Right now, information availability at the RO level is not that good leading to obstacles in interaction with industry during field visits. Such information will lead to better enforcement and monitoring. A simple example can be if the field officer going for a visit knows about the previous history of the company he can take action regarding cess collection also along with the sampling activity.

Internal Transparency

IT systems will promote transparency and accountability within the organization and as such will serve as a system of checks and balances.

Need to build an IT Unit

MPCB should consider building a small, dedicated IT unit or outsourcing the IT needs as it will be an important efficiency driver in the coming years.

Persevere for Some Time

MPCB has appointed a consultant to design and implement the IT system across the organization. CRISIL's past experience with other organizations has revealed that the first attempt at computerization usually is not up to the expectations because of unavoidable failure in mapping the future needs of an organization. This can lead to disillusionment and skepticism about the utility of the whole exercise. However, it will be worthwhile to persevere with the system and accept the inevitability of continuous improvement in IT systems.



9.3 NEED FOR A NODAL POINT

Currently all the departments function independently with very few information flow or co-ordination between them. As a result, there are a lot of operation issues. For instance, the Cess department is not aware of the new consents granted. Similarly when a new act of regulation comes up, all the departments are not aware of the same. Hence there is a need for an internal co-ordination department. This department would act as an internal information provider which would also help when the Board is gradually moving to an information based approach.

9.4 FINANCE AND ACCOUNTS

The two biggest concerns that emerge on studying the Finance & Accounts system within MPCB are the lack of annual planning and reporting and the overall lack of transparency in the availability of information relating to finances.

Annual planned budgeting Exercise

The annual planning budgeting exercise needs improvement. It is essential that this be done by compulsion on an annual basis as without the budget estimates it's impossible to measure the performance of the organization versus its own targets. The other benefit of the annual budgeting exercise is that it forces the various departments to review their operations and analyze them from an operational perspective. Budgeting also leads to more planned, rather than Ad-hoc spending.

Annual Reporting

The Annual Reports for the last few years are unavailable with MPCB due to requirement of detailed accounts from the field offices and reconciliation of advances paid to employees to the tune of around four crores. This is a serious breach of the accountability that the public expects from MPCB. Immediate action needs to be taken to ensure that Annual Reports are generated regularly on an annual basis as these are the most significant document that MPCB brings out to announce its performance to the public. Lack of timely reporting can lead to a perception of unaccountability and allegations of malfeasance.



Institutional Capacity Building - MPCB

Consolidation of the Accounting Department

One of the problems which surfaced during discussions with MPCB officials was that there was a duplication of the accounting staff across various locations. An instance was mentioned wherein 4 MPCB offices in a single region had their own accounts set up. These departments were handling very limited number of transactions. This is inefficient use of resources and it is such unplanned staff allocation that has distorted the Staff composition. The rolling out of a new IT system must be used to rationalize the Accounting process and redeploy redundant staff to new activities. Accounting capabilities at the RO level may need to be strengthened if cess collection is proposed to be decentralized to the RO level.

Clarity on the Receivables

It is difficult to estimate the amount of receivables outstanding and hence to analyze the defaulters. Instances were mentioned wherein companies that have long since stopped operating are still listed as defaulters. Regular updation and maintenance of such information is necessary if the organization is to build up its credibility as an enforcement agency.

Funding for Modernization

MPCB has to make a dedicated effort to secure funding from external agencies to beef up its capabilities by investing more in the technical infrastructure development, IT system development and training of staff. Some other state boards have been quite successful in attracting funds from International agencies in this regard.

Switching to Double Entry System

Currently MPCB is maintaining its Accounts on a single entry basis. The problems in this system include difficulties in verifying the accuracy of the accounts and non-recording of outstanding amounts including receivables. MPCB may consider adopting a double entry system. This may require external assistance in the form of developing a system, creating a manual, implementing a parallel run, training of employees and assisting in independent running of the same.



9.5 CESS AND COLLECTION

Cess collection remains one of the key activities of MPCB. It is the closest experiment with pollution charges or the “Polluter Pays principle” as described in the previous section. The key issues identified with respect to cess collection are:

Increased Coverage means greater Effort

With the changes in provisions of the water cess Act that had several exemptions previously a large number of previously uncovered units will be brought into the cess collection net. This implies increased coverage, which means that an urgent effort is necessary which will build a credible and updated database of units that are to pay the cess. As of now, nobody in MPCB is sure about the number of industries that will come under the cess collection net- we got figures ranging from 25000 to 50000. The database will be the basis on which cess collection estimates can be built and subsequent performance measurement can be done by comparing actual collection with the budgeted targets (collection efficiency). Efficient administration in this regard can build MPCB’s financial strength significantly, which will provide resources for future modernization activity and infrastructure up gradation.

Decentralization of Cess Collection

Right now the cess collection activity is concentrated at the Member Secretary and HO level. We feel that this is not the right approach. The HO level administration should be more focused towards Policy issues, managing the organization rather than focusing on operational level activities like cess collection. Decentralization along with proper information flow will also add enforcement teeth as the individual visiting the unit can penalize it for cess collection also along with checking for pollution control.

Involving Banks and other new Payment Mechanisms

The cess collection process should be simplified so that industry can make payments at the bank in their respective areas. This will reduce MPCB’s workload as well as make the whole process simpler for the industry. Online payments could lead to quicker collection and save the MPCB staff from the hassle of processing the cheques.



Institutional Capacity Building - MPCB

Change the Collection Frequency

The collection frequency from small-scale units that pay a nominal amount needs to be reduced. It can be changed to a one-time payment for, say, the entire year. Such a move will reduce MPCB's workload.

Not the real "Polluter Pays" Charge

The cess collection mechanism in place as of now is not exactly in line with the philosophy of pollution charges as it is volumetric rather than being in proportion to the toxicity of the effluent. The ideal system should be toxicity based; as such a system will charge the polluter for the actual pollution that he is causing.

HW Rules, 1989 provide for a levy of fine under Rule 16. Under this rules, MPCB can levy fine in consultation with CPCB for violations of provisions under the HW Rules. Board can also recover cost of remediation from the polluter and also undertake the work of ecological restoration on "polluter pays" principle.



10 TECHNICAL REVIEW - FINDINGS

Maharashtra Pollution Control Board is maintaining seven laboratories in the state. There is a well-equipped central laboratory and six regional laboratories. The location of these laboratories is given in table 1.

Sr. No	Name of the Region	Address
1	Central Laboratory	Central Laboratory, CIDCO Bhavan, Navi-Mumbai.
2	Regional Laboratory, Pune	Regional Laboratory Pune, S.No. 21/5, F.P.No. 28, Wakdewadi, Pune-Mumbai Road, Pune - 411 003
3	Regional Laboratory, Nagpur	Regional Laboratory Nagpur Udyog Bhavan, 6th floor, Near Sales Tax Office, Civil Lines, Nagpur - 440 001.
4	Regional Laboratory, Aurangabad	Regional Laboratory Aurangabad Paryavaran Bhavan, Plot No. A-4/1, Chikalthana MIDC Area, Behind Daink Lokpatra, Jalna Road, Aurangabad - 431 210
5	Regional Laboratory, Thane	Regional Laboratory Thane Plot No. P-30, 5th floor, Office Complex Building, Mulund Check Naka, Thane.



Institutional Capacity Building - MPCB

6	Regional Laboratory, Chiplun	Regional Laboratory Chiplun Parkar Complex, 1st floor, Near Chiplun Municipal Council Office, Chiplun, Dist. Ratnagiri.
7	Regional Laboratory, Nashik	Regional Laboratory, Nashik Kailas Deep', 3rd floor, Jail Road, Nashik Road Nashik.

Table 2: Central and Regional Laboratories

The major objective of the laboratories is to provide services for the analysis of water and wastewater, air and flue gases and hazardous waste samples for various parameters prescribed as per the consent conditions. Each laboratory comprises three sections - water, air and hazardous waste - in order to discharge its functions. The water section carries out physical, chemical, bacteriological and bioassay analysis of waters, wastewaters, and sewage and trade effluents. These samples are categorized as either environmental samples, joint vigilance samples or law evidence samples.

In the current organization structure, laboratories are placed at two levels. At the central level, there is a central laboratory, which falls under the jurisdiction of the scientific wing. The central laboratory is headed by a senior scientific officer who report directly to the Member Secretary. At the regional level, the laboratories come under the jurisdiction of the regional office, which forms a part of the technical wing. The regional laboratory is headed by a regional officer who reports directly to the Member Secretary.



Institutional Capacity Building - MPCB

10.1 STRATEGIC ASSESSMENT

Strategic assessment was carried out using a structured approach. At first, a sample was selected so that it adequately represented the existing scenario. Further, future business assessment was carried out considering the emerging scenario. A sample of five labs consisting of one central lab and four regional labs was taken for strategic assessment.

The four regional labs which have been covered under this sample are given below.

- Regional Laboratory, Pune
- Regional Laboratory, Nagpur
- Regional Laboratory, Thane
- Regional Laboratory, Nashik

This assessment was carried out through a questionnaire survey followed by interaction at each of the labs. All the completed questionnaires are given in appendix 1.

10.1.1 Internal Scrutiny

Internal scrutiny has been carried out by mapping the results of the questionnaire survey into a tabular format. This mapping has been carried out under the following heads.

- Organizational/Human resources
- Type of testing
- Perception of staff

The results have been broadly summarized under these heads in table 2.

Organizational/Human resources have been measured with respect to skill level of staff and total number of staff. Skill level of technical staff has been assessed with respect to the following attributes:

1. Level of education ex. Graduation/post graduation/doctorate
2. Level of training i.e. induction training/specialized training
3. Human factor ex. motivation level



Institutional Capacity Building - MPCB

Testing carried out by the lab has been assessed with respect to the following:

1. Routine testing
2. Specialized testing

Perception of staff has been assessed based on the following factors.

1. Perception with respect to additional manpower
2. Perception with respect to equipment
3. Perception with respect to capacity building/training
4. Perception with respect to motivation



Institutional Capacity Building - MPCB

S. No	Name of Laboratory	Organizational / Human Resources							Type of Testing						Perception			
		Number of Staff	Skilled for lab operation				Semi-Skilled	Air	Water	Solid Waste	Hazardous Waste	Bio-Medical Waste	Miscellaneous	Eq	CB	Mo	Ma	
			Graduate	Post-Graduate	Doctoral	Training												
						General												Specialized
1	Central Laboratory, Navi Mumbai	57	16	9	1	×	✓	4	✓	✓	✓	✓	×	✓	✓	×	×	
2.	MPCB Regional Lab., Nagpur	10	2	3	×	×	✓	×	✓	✓	✓	✓	×	×	✓	✓	×	✓
3.	Regional Lab., Pune	10	4	2	×	✓	✓	4	✓	✓	×	✓	×	×	✓	✓	×	✓
4.	Regional Lab., Thane	8	1	2	1	×	×	2	✓	✓	✓	✓	×	✓	✓	×	×	
5.	Regional Lab., Nashik	11	6	1	1	✓	✓	3	✓	✓	✓	✓	×	×	✓	✓	×	✓

Table 3: Resource mapping of laboratories

Eq → equipment; CB → capacity building / training; Mo → motivation; Ma → manpower



Institutional Capacity Building - MPCB

Key Inferences:

- The percentage of skilled staff with respect to total staff of the laboratory varies from 45 to 72. The lower proportion indicates higher size of scale of operation where greater logistical/ support services are required.
- The percentage of post graduate staff varies from 14 to 60 of the total skilled staff.
- The percentage of doctorate staff varies from 0 to 25.
- All the technical staff are science graduates. The existing staff has a minimum qualification of graduation to carry out routine work.
- Ratio of post graduate to graduate is much higher than the ratio of doctorate to graduate.
- No generic/induction training was given to the lab staff.
- Limited specialized training was imparted through an outside agency to a few staff.
- At regional level, laboratories have one more layer of hierarchy than at the central level.
- The regional laboratories cater to the requirements of regional offices, while central laboratory caters to samples from all over the State.
- The central laboratory is better equipped in comparison to regional laboratories.
- The laboratories are carrying out all the relevant tests related to compliance as per the Air and Water Acts.
- Routine testing of samples constitutes the major part of work carried out by all the labs.
- Labs have limited capacity to carry out specialized tests
- All the lab staff feel that they need more equipment for using new techniques for higher sophistication and better accuracy of results.
- All the lab staff feel that training/capacity building is virtually non-existent.
- The majority of lab staff feel that additional manpower is required to cater to increase in testing.
- There is no motivation to carry out routine work.
- Time bound promotion is lacking for lab staff
- Award/incentive system for lab staff is virtually non-existent.



10.1.2 External Scrutiny

External environment status can be assessed with respect to the following:

1. Stricter compliance
2. Emerging areas coming within compliance

Workload on labs is going to increase due to stricter compliance requirements in Maharashtra. This includes increase in number of samples and number of parameters for testing. This will also include increase in geographical jurisdiction of labs. The new areas e.g. Hazardous waste, bio-medical waste, solid waste and emission monitoring will require additional testing capabilities and capacities.

10.2 BARRIER ANALYSIS

Barrier analysis has been studied by carrying out internal and external scrutiny. The major findings of barrier analysis have been summarized below.

- Limited resources to carry out laboratory work
- Limited equipment exists at MPCB for carrying out specialized testing
- Limited staff for carrying out specialized testing
- Limited skill level of laboratory staff
- Limited training to lab staff
- Limited R&D work
- Limited working space and working area
- Functional hierarchy of laboratory is not well defined
- Procedural constraints in functioning of laboratory
- Absence of award/ incentive mechanisms
- Presence of temporary staff



10.3 NEEDS ASSESSMENT:

In the existing scenario of MPCB, postgraduate and doctorate employees are very few. The status of training programs shows that no organized training programs are conducted for the lab staff at any level. In order to cater to the emerging external environment, MPCB requires lab staff with new/ additional skills.

1. The functionality of the laboratories needs to be harmonized within the overall organizational structure
2. The hierarchy of the laboratory needs to be well defined in the overall organization structure.
3. Need for up-gradation of skills by induction of new staff with higher qualifications.
4. Need for training existing staff.
5. The labs require more equipment to carry out tests.
6. Labs require more space for expansion and better working conditions.
7. Increase in motivation by introducing award/ incentive schemes