VISION 2030
OF
STATE POLLUTION CONTROL BOARD, ORISSA

State Pollution Control Board, Orissa
A/118, Nilakantha Nagar, Bhubaneswar - 751 012

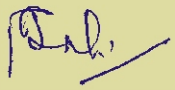
In Association with
Indian Institute of Technology,
Kharagpur, West Bengal - 721 302

Supported by
Central Pollution Control Board,
East Arjun Nagar, Delhi - 110 032

Foreward

Orissa is on the path of rapid industrialization and urbanization. On account of such development there is likelihood that it may cause adverse impact on environment and quality of life. For sustainable growth, a good management system needs to be in place to protect and safeguard environment and related conditions. State Pollution Control Board, Orissa is the apex body to keep the pollution under control in the State through enforcement of various environmental legislations. The management practices followed have been effective only in the short term. The Board felt the need of a strategic plan containing both the long-term goals and the short term objectives. On the request of the Board, Prof. Pratap K. J. Mohapatra of IIT, Kharagpur, who has his rich experience and expertise on the subject, has prepared the Vision 2030 document in consultation with the Board officials and other stakeholders.

The Vision 2030 document has been developed through a consultative process. Attempt has been made to make it as comprehensive as possible with due attention on its implementability. The Board will be guided by various goals, objectives and strategies proposed in the Vision 2030 while preparing the annual plans and implementing the same. Any suggestions for improvement will be welcome. I take this opportunity to thank all those who have been involved to bring out this document.



Sri R.N. Senapati, I.A.S.
CHAIRMAN

Acknowledgements

The task of facilitating the preparation of the Vision 2030 document for the State Pollution Control Board, Orissa was extremely satisfying. Having to lead a discussion on the twenty-year future of the Board with the help of its scientists and engineers was both challenging and rewarding. The then Chairman of the Board, Mr. T.K. Misra, IAS, Chief Secretary, Government of Orissa approved this project. The past Member Secretary of the Board, Dr. B. K. Mishra, initiated the study, provided the full support from the Board, attended the first few brainstorming sessions, and arranged for a one-point contact for me in the Board. That one-point contact was Mr. B. N. Bhol. Mr. Bhol not only coordinated the study by unhesitatingly sharing with me copies of important past documents and reports, organizing in-house meetings and visits to industrial units, and circulating the questionnaires and office memos regarding the study, but also took active part himself in the brainstorming sessions and the questionnaire surveys, and even prepared a format of the final vision document.

I shall fondly remember the brainstorming sessions for Dr. D. K. Behera's humorously-placed brilliant and often provocative ideas, Mr. B. N. Bhol's gentle and persuasive power to concentrate on the discussion, and Er. N. R. Sahoo's finely worded elaboration in defence of selected strategies. Dr. U. R. Patnaik emphasized the role of the community when the goals of the Board were being formulated. And Er.(Dr.) A. K Swar continued to be an integral part of the core group of officers who took intense interest in the present study.

My visits to Jharsuguda and Paradeep were very useful. The Regional Officers, Er. S.K. Sahu and Dr. D.K. Rout, and their colleagues prepared the schedules and coordinated the details of the visits to the industrial units, and accompanied me and my colleague Dr. B.K. Das during our visits to the industrial units. The most important observation we made was the dedication of the staff of the regional offices to their work in spite of limited facilities available with them. The patience with which various pollution-related issues were explained to us by the industrial units and the hospitality they gave us during our visits are certainly worth-mentioning.

During the study, I had the opportunity of interacting with Mr. U. N. Behera, IAS, Commissioner-cum-Secretary (Environment & Forests) of Government of Orissa and Mr. R. P. Panda, General Manager, IPICOL. Both Mr. Behera and Mr. Panda outlined the nature of industrial and economic growth the state of Orissa is likely to experience in the future and its effects on the environment, and brought out many issues and strategies that the study needed to consider.

I thank the current Chairman Mr. R.N. Senapati, IAS, Development Commissioner, and current Member Secretary Mr. S. Das, IFS for having gone through the drafts on the Goal-Objective-Strategy set of the document very carefully and for having given his very thoughtful feedback on many issues. I also thank him to have allowed me to submit this report long after the due date of its submission.

I am grateful to Dr. B. K. Das, Executive Engineer (Civil), Government of Orissa for accompanying me to the industrial units at Jharsuguda and Paradeep and for enlightening me with many novel and practical ideas.

I received help, cooperation, and love from everyone I interacted with during the study. I thank them all.

The change that the Board has brought about in the mind of the industrialists in terms of awareness about the pollution control is awesome. I think, it was very timely that the Board thought about developing the Vision 2030 document. I only wish that the document should be used by this young and enthusiastic manpower of the Board to build capacity, make preemptive plans, and implement them effectively to make Orissa the most environment-friendly state in the country.

Pratap K. J. Mohapatra

Table of Contents

1.0 Introduction

State Pollution Control Board, Orissa (SPCB) was established in 1983 under the provisions of Water (Prevention and Control of Pollution (PCP)) Act, 1974. Many Acts such as Air (PCP) Act, 1981, Water (PCP) Cess Act, 1977, Hazardous Waste (Management, Handling and Transboundary Movement) Rule, 2008, Municipal Solid-Waste (Management and Handling) Rules, 2000 Bio-medical Waste (Management and Handling) Rules 1998, and EIA notifications under Environment (Protection) Act, 1986 were introduced later, and the functions and responsibilities of the Board expanded many times with the progress of time.

The Board has completed twenty-five years of its existence. During this period, it has exhibited excellent professional competence in dealing with various issues in the field of environmental managementenvironment monitoring and compliance, environmental policy research, and creation of public awareness, to name a few. The issues have become more challenging during the recent years when the state of Orissa experienced the fastest industrial growth with large-scale capital investment, rapid industrialization, and increasing citizen demand for a better environment. The inertia of industrial and economic growth is expected to continue for a long time and the emerging environmental issues are likely to be more challenging than ever before.

This mineral-rich state is likely to see the establishment of many more mining and mineral-based industrial units in the near future. The long coastline of the state is also likely to induce many investors to go for port-based industrial units. These developments will be invariably accompanied by an unprecedented growth of infrastructure. All these new activities will definitely influence the state of environment in the state. Unless anticipated and judiciously handled, the environmental issues will adversely influence the industrial and economic growth of the state.

At such a juncture, the Board needs to act proactively and prepare itself well in advance to handle the environmental issues effectively. As a part of this preparedness program, the Board desires to have a vision document to provide an appropriate framework for successfully navigating into the coming twenty years. The objective of this exercise is to envision the future challenges, identify achievable mission themes, set achievable long-term goals and short-term objectives, formulate appropriate strategies to achieve them, and prioritize them for implementation.

This document is the result of a year-long exercise by the officers of the Board to envision the Board's future by providing for it a road map into the future and by drawing up appropriate action plans to achieve excellence.

1.1 The Genesis of the Document

On 13th August 2008, State Pollution Control Board, Orissa requested for the author's assistance to prepare the Vision 2030 document for the Board. The author submitted such a proposal on 18th September 2008. On 5th November 2008, the Board accepted the proposal and made a formal request to prepare the document. Based on this document, the author held preliminary discussions with the officials of the Board during December, 2008. The work formally started on 1st January 2009.

In its first letter dated 13th August 2008, the Board indicated that the Vision document should be prepared to "achieve the desired objectives in a more systematic manner and fulfill its additional responsibilities that it may have to shoulder in the next twenty years." It further indicated that the document needed to be prepared along the lines of those prepared for Gujarat Pollution Control Board [11] or for Maharashtra Pollution Control Board [2][12]. It also enclosed in its letter a base paper prepared internally by the Board.

The proposal submitted to the Board to take up the work made it amply clear that a vision document is a strategic plan for the Board, and the quality of the plan can be no better than the quality of the strategic planning process which generates it. The plan can be implemented successfully only if the Board officials own it, the proposal stressed. The proposal thus sought the active participation of the Board officials to evolve the document, with the author facilitating the process of evolution of the document.

1.2 The Scope of the Document

It was decided at the start of the project that the scope of the document will be limited to giving shape to a shared vision and a mission, delineating long-term goals and short-term objectives, formulating high-leverage strategies, and time-phasing them to achieve the set goals and objectives. The detailed action plans were not to be included as part of the document.

The document needed to consider issues relevant to the state of Orissa and the Board during the next twenty years, and thus the planning horizon for the document was fixed at twenty years.

It was also decided that the document has to evolve from within the Board, with the Board officers actively participating in the strategic planning process and, thus, owning the document.

2.0 Methodology Adopted for Development of the Document

The development of the document took place in three phases. Figure 1 shows the phases and the methodology adopted in each phase of development of the Vision 2030 document. The phases are the following:

1. The Sensitization Phase
2. The Learning Phase
3. The Document Development Phase

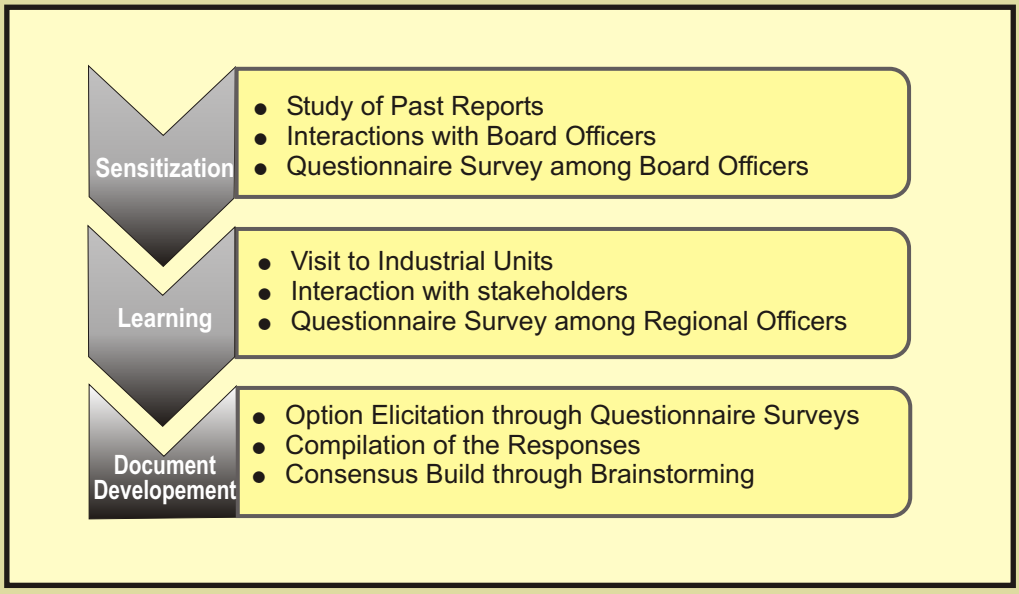


Fig. 1: Development Phases and Methodology

The methodology is elaborated below.

2.1 The Sensitization Phase

The concepts and ideas of Board officials regarding the requirements of a vision document were as nebulous as they were for the author regarding the Board's responsibilities, work culture, and future challenges. It was necessary for both to go through a process of sensitization. The primary tools used for the purpose were the following:

1. Study of Past Documents and Reports
2. Interactions with the Board Officials
3. Questionnaire Surveys

The Board shared, with the author, a large number of relevant documents that were available with them. They are listed in the References [3], [4], [7][12], [14][22], [24][28]. Study of these documents helped the author to understand the basic authorities and responsibilities bestowed on the Board and the recommendations of various bodies with regard to prevention and control of pollution generated by mining and manufacturing sectors of the state and the ways the Board should be geared up to face the emerging challenges.

There were a number of meetings where the author had short, but intense, interactions with a number of Board officials. Each such meeting was devoted to a brainstorming session among the Board officials, and each such session was followed by a questionnaire survey. Such a strategy was followed in order to (1) sensitize the participants to the most influential issues for the Board in the future and awaken them to rise above their mundane and routine activities to dwell upon the abstract world of the future, (2) firm up the ideas generated in the meetings in the form of written responses, and to (3) compile a summary of responses which were discussed, modified (if required), and accepted by all concerned.

The interactions and the questionnaire surveys benefited both the groups in understanding and clarifying issues related to the following:

The roles that the Board plays and the strategies that it follows at the present,
The internal strengths and weaknesses of the Board,
The challenges that lie ahead and the new roles that the Board is likely to be called upon to play in the next two decades,
The ways the performance of the Board can be evaluated and the performance indicators,
The enabling and the inhibiting factors influencing the performance of the Board,
New strategies to effectively play new roles, and
The need and scope of the Vision 2030 document and the ways it will be used.

The formats of the questionnaire used for eliciting the views of the Board employees are given in Annexe 1 and Annexe 2.

2.2 The Learning Phase

This phase consisted of three sub-phases:

1. Visit to a Sample of Industrial Units
2. Interviews with Selected Stakeholders
3. Questionnaire Survey among the Regional Officers

The documents and experiences shared by the Board members were no substitute for learning from personal experience. The Board arranged the following visits and interviews for the author to get to know the ground realities:

1. A number of visits to a few selected mining and manufacturing companies located in Jharsuguda and Paradip and to the respective regional offices (List of regional offices and companies visited is given in Annexe 3)
2. Interviews with selected persons and with an industry association (List is given in Annexe 4)

Visits to two regional offices of the Board and to various industrial units located at two fast-growing industrial districts of the state (Jharsuguda and Paradip) and prolonged discussion with the concerned officials at their premises highlighted many practices followed by the units and the activities of the regional offices of the Board.

A presentation by the executive body members of the Stone Crushers Association this group represents a splinter set of small-scale enterprises and a discussion following the presentation brought out many unsolved problems of pollution generation and control in these units.

Interviews were organized with General Manager, IPICOL and Secretary to Government of Orissa in Department of Forests and Environment. These interviews helped to appreciate the future industrial scenario of the state and to prioritize the present and the futuristic issues pertaining to generation, prevention, and control of industrial pollution.

Regional offices of the Board are the bodies that are the nearest to the sources of pollution generation. They monitor the extent of pollution discharged to the environment by the industrial units, report to the Head Office, and check whether the units have complied with the Board's direction with regard to pollution control. They play a very crucial role in successfully achieving the Board's primary objectives. A questionnaire survey was conducted among the regional offices requesting them to highlight their success and failure stories and to give vent to their opinion on the future economic and industrial growth in their respective regions and the nature of problems afflicting their success.

The questionnaire for the regional officers is given in Annexe 5.

It must be stated here that we did prepare a questionnaire for the NGOs to highlight environmental issues. This questionnaire was circulated to selected NGOs through the regional offices, but no response was

received. We, thus, had to take the outcomes of Public Meetings conducted by the Board and the opinion expressed in various public hearings that are conducted for establishment of projects (as narrated to us by Board officials) as indicative of the public opinion on the subject.

The visits to the industrial units, interviews with selected personalities and industry representatives, and the responses to the questionnaires sent to the regional officers were invaluable and provided critical inputs to the preparation of the Vision 2030 document.

2.3 The Document Development Phase

Stated simply, a vision document for an organization reflects (1) the objectives of the organization for a specified foreseeable future period and (2) the strategic means to achieve them. But "organizations do not have objectives, only people have objectives." (Cyert and March [5]). Therefore, "the objectives of a firm are in reality a negotiated consensus of objectives of the influential participants." (Ansoff [1]). On the strength of these time-tested observations by the pioneers in the field of strategic management, it was decided to conduct a number of brainstorming sessions among the Board officials and to consider consensus of their views as indicative of their values, aspirations, and capability in the future.

The Vision 2030 document has seen the light of the day after a series of brainstorming sessions among the officers of the Board for more than four months, followed at times by questionnaire surveys. Each brainstorming session (and questionnaire survey) was followed by a compilation of the ideas generated in the session. The compiled ideas were circulated among the participants for their feedback, modification, and consent. The outcome report of one session became the source document, and provided the baseline, for discussion in the following brainstorming session. The cycles of opinion elicitation, idea compilation, and accepted baseline formation spiraled into generating the final document.

The sequence of steps which were followed to arrive at a consensus on the final document is the following:

1. A questionnaire survey among the officers to extract their opinion on the broad long-term goals of the Board. The questionnaire is given in Annexe 6.
2. Compiling, rationalizing (deleting duplicate points and filtering out those that could logically be either a short-term objective or an action plan), and summarizing the responses to the questionnaire in terms of five broad goals for the Board with the help of a selected number of officers.
3. Inviting the officers' views on the nature of the formulation of the goals so as to reach a consensus with regard to these high-level constructs. The letter to the officers, which not only stated the

goals but also gave explanatory notes and examples in support of the short-term objectives for each goal, is given in Annexe 7.

4. Brainstorming on the comments received on the compiled goals and finalizing them while ensuring that the long-term goals are indicative of high-level aspirations of the Board and are focused, precise, and compact.
5. Forming five teams of officers one for each goal with each team to brainstorm on the supporting objectives for the assigned goal. The composition of each team, the team leader's names, and the assigned goals are given in Annexe 8. The letter to the officers requested them, among other things, to consider that the objectives are to be aligned with the goals and are to be focused and measurable (quantifiable so as to monitor progress towards a target or a benchmark), and are to be attainable within a specified timeframe.
6. Compiling the objectives for each goal and having a series of brainstorming sessions among the officers to reach a consensus. The objectives had to reflect the Orissa-specific features (such as the growth of coal- and mine-based industries, proliferation of small-and-medium scale industries, and increased coast-based economic activities).
7. Formulating strategies for each objective and prioritizing them by holding a number of brainstorming sessions among the officers of the Board. The compiled goal-objective-strategy document prepared after a brainstorming session was invariably used as input to the next brainstorming session.
8. Preparing vision and mission statements for the Board. These two statements usually appear at the beginning of any vision document. The task of preparing the two statements was taken up only after the goals, objectives, and strategies were decided, because when the effort at building the structure of the document began, the ideas were completely nebulous, and that time was considered too early to frame the concepts and the language of these two very important statements. Preparation of these two statements needed a study of such statements by organizations that are engaged in the management of environment and of the considered feedbacks from the officers of the Board.

Figure 2 shows the steps followed for developing the Vision 2030 document.

The vision document finally submitted is, thus, a result of shared and consensus of views of the officers of the Board, which was achieved through a number of questionnaire surveys and facilitated brainstorming sessions. It is worth mentioning that many recommendations made in various reports in the past, in particular by World Bank [24][25][26][27][28], were injected for discussion during the brainstorming sessions.

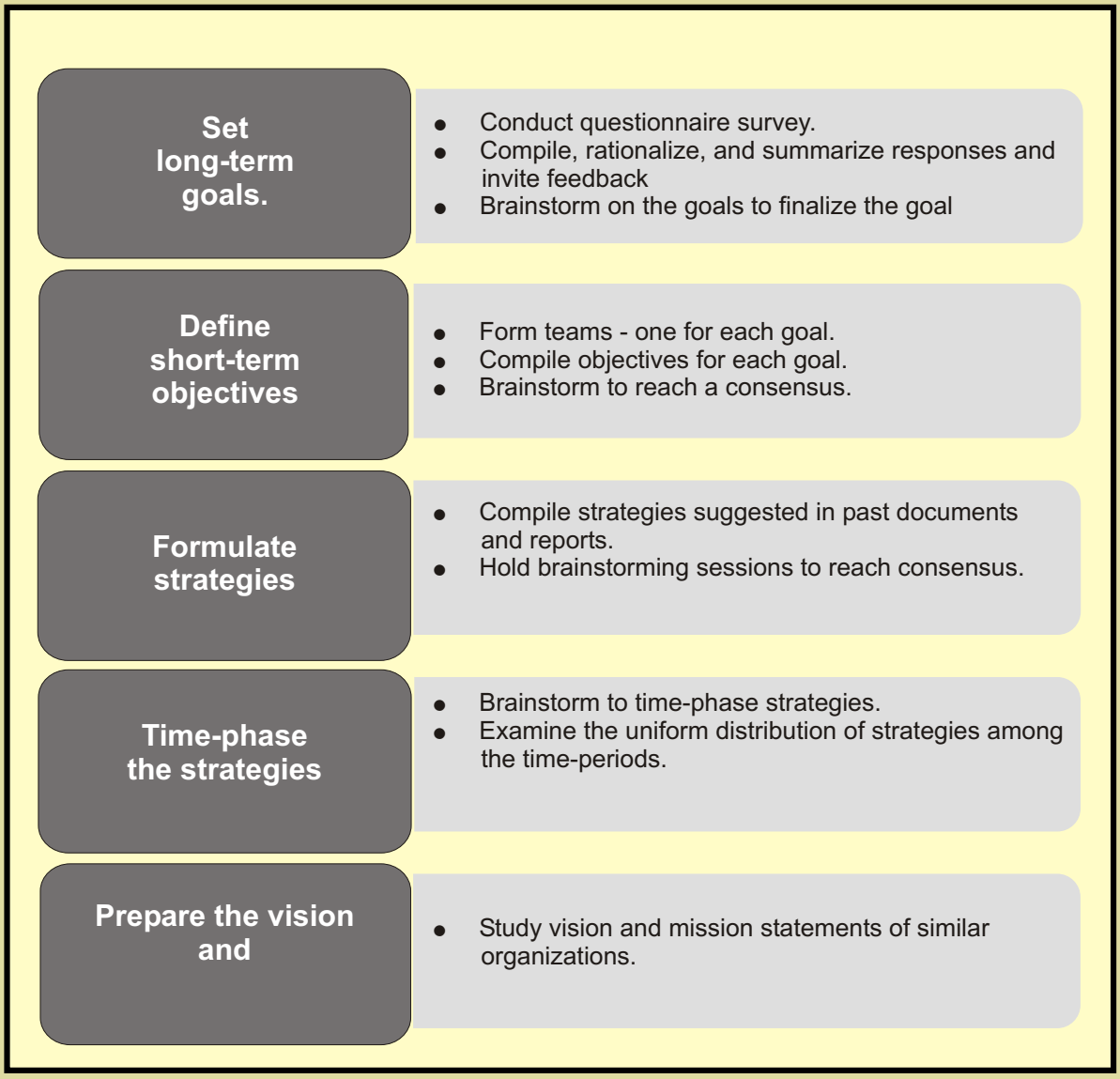


Fig. 2: Steps in the Development of the Document

3.0 Interim Results of the Study

3.1 Summary of Responses in the Questionnaire Surveys

As stated above, much of the opinion of the Board officers was collected through questionnaire surveys. The summaries of responses received from the Board officers in the questionnaire surveys conducted in the sensitization phase are given in Annexe 9 and Annexe 10, whereas the summary of responses received from the regional officers in the learning phase are given in Annexe 11. We give below a brief summary of their responses.

3.1.1 Why a Vision Document?

The Vision document is seen by the officers of the Board as a reflection of the preparedness of the Board to handle future pollution-related problems in the state. It is conceived as a long-term plan of the Board that compiles emerging pollution issues, articulates well-thought out strategies to handle them effectively, and indicates the process of building up its own physical and intellectual capacity.

3.1.2 Users of the Vision Document

The Vision document makes the strategic purpose of an organization explicit and serves all stakeholders of the Board. Stakeholders are parties who have an interest (or stake) in the success or performance of an organization. Figure 3 shows the stakeholders of the Board in a diagrammatic form. The internal stakeholders of the Board are its own employees, whereas the external stakeholders are State Government departments, Central Government departments, Central Pollution Control Board, Industries and Industry Associations, Research organizations working on environment-related problems, Financial institutions, NGOs, Local community, and Society at large.

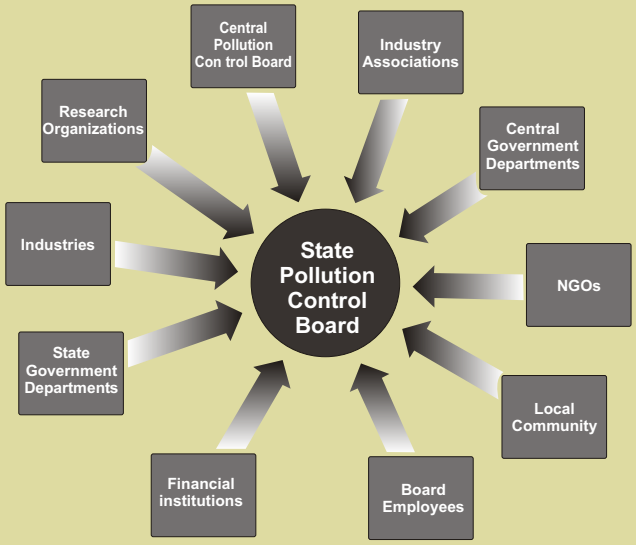


Fig. 3: Stakeholders of the Board

The Board employees will be the principal users of the document. Because the document will be placed in public domain, the external stakeholders will also use the document to judge, in a variety of ways, the preparedness of the Board to address environment-related issues.,

3.1.3 Ways the Document Will Be Used

The Board will be the primary user of this document. The document will guide the Board to anticipate emerging environment-related issues, formulate major strategies, and make time-phased action plans for Orissa-specific sectors (like mining, steel, thermal, and aluminium), and build its capacity.

The other stakeholders can use the document in a variety of ways. Various state government departments (such as Departments of Water Resources, Energy, Industries, Steel & Mines, Housing & Urban Development, Commerce & Transport, Planning and Coordination, Finance and Law) can use the document to address environment-related concerns while formulating its sector-specific policies. Central Pollution Control Board can examine the document to judge the degree of alignment of the State Board's strategies and policies with those of its own. Industry associations and industrial organizations can use the document in dove-tailing their policies and plans, related to technology choice and environmental management, with the vision of the Board and work as a partner in environmental protection and management. Research organizations working on environment-related problems and engaged in futuristic projections can refer to the document to know the Board's long-term policies and action plans. The financial institutions and international donor agencies can use this document to decide on their lending policies. Being in public domain, the document will enhance public awareness about environmental issues, benefiting the local community and the society at large.

3.1.4 Roles the Board Plays at the Present

The Board is the statutory body to ensure a pollution-free environment in the state. Its principal function is to ensure compliance of environment-related laws and acts by the industrial units and other establishments. In addition, it helps in formulating government policies, promotes compliance by designing incentives for environmentally good industrial units, plays a proactive role in identifying new sources of pollution hazards, and enhances public awareness about environmental issues and public participation in making environment-related decisions.

3.1.5 Strategies the Board Follows at the Present

To play the above-mentioned role, the Board has followed many strategies, the chief among them are: standardization of functions, division of work among the regional offices and the head office, deployment

of IT services, engagement of external experts in selected areas, use of bank guarantee for effective compliance, and issue of show-cause and closure notices in extreme cases.

3.1.6 New Roles the Board Will Play in the Next Two Decades

The Board is likely to be called upon to be more transparent, public friendly, cooperative and more pro-active in addressing emerging environmental issues, and to be a designer of a new mode of self-regulatory pollution control.

3.1.7 Major Strengths of the Board

The major strengths of the Board lie in the clarity of its mandates, standard work procedures, political non-interference, and in a young, committed, and qualified workforce with high integrity.

3.1.8 Major Weaknesses of the Board

The weaknesses of the Board spring mostly from high volume of work load. The high volume of work load completely engages the scientists' and engineers' time and mind, leaving them almost no time to introspect, carry out organization redesign exercise, design IT-enabled communication channels, innovate predictive and preventive ways to environment management, prepare new project plans, plan for capacity building, generate public awareness, and to redress public grievances satisfactorily.

3.1.9 Challenges before the Board in the Next Two Decades

With the state of Orissa witnessing phenomenal industrial and economic growth, the Board is certain to be called upon to address many environment-related challenges. The challenges range from anticipating the emerging environmental issues related to mining, mineral, thermal, and coast-based industries and building up its intellectual and infrastructural capacity to take up these challenges effectively to expanding the scope of pollution control to construction, municipal and domestic systems and generating public awareness to environment demands. From the viewpoint of effectiveness of implementation of the Board's policies, the challenge is to create an environment which is conducive to the development and nurturing of partnership among the main actors in the management of environmentthe industry, the common man, and the Board.

3.1.10 Performance Indicators of the Board

Performance measurement is not easy for a non-profit, government organization whose goals are not

defined quantitatively. The ultimate indicators of the Board's performance are the quantitatively expressed levels of emission of pollutants, ambient air quality, water quality, and region-specific biological environmental quality. But there can be a large number of surrogate measures of Board's performance. They are: The compliance status parameters (Percentage of compliance achieved by the regulated group, Average time separating violation of a standard and exercise of an enforcement action, Frequency of inspection and monitoring, Number of public complaints and assembly and parliament questions, Time taken to attend to public complaints, and Number of court cases filed by the Board), Number of industrial units coming under the ambit of the Board, Time to process applications for consent to establish, consent to operate, and authorization, Delay in project implementation, Percentage coverage of industrial and mining zone for which regional environmental management plan is developed, Area covered under air pollution monitoring network, and Stretch of rivers covered under the monitoring programme.

3.1.11 Enabling Factors for the Performance of the Board

The primary factors that have helped the Board to achieve its mandate are: Clarity of its mandate, Self-sufficiency in finance, Minimal interference from the Government, Well-qualified and multi-disciplinary scientific and technical manpower, and Well-documented procedures and guidelines in most cases.

3.1.12 Inhibiting Factors for the Performance of the Board

The factors that have hindered the Board to achieve excellence stem mainly from the inadequate level of technical manpower and infrastructure that constrains the Board so much that the scientists and engineers are left with no time for organization redesign, capacity and infrastructure building, or even documenting success stories. Another inhibiting factor is the difficulty in implementing the Board's decisions in the case of small-scale industrial units who are rather financially weak to invest in pollution control mechanisms.

3.1.13 Present Strategies for Performance Enhancement

The Board has deployed various strategies over the years to improve its performance. Among the most striking ones are: the strategies of delegating power and decentralization of decision-making process to regional offices, simplifying and standardizing procedures, opening new regional offices and strengthening them, introducing the system to give consent to operate for five years, installing IT-enabled systems in selected areas, and enforcing pollution control laws by coercive means whenever absolutely essential.

3.1.14 Strategies to Play New Roles Effectively

Strategies to play the new roles have to be novel, timely, and pro-active. The strategies that the Board has to adopt to play the new roles effectively are: organizational redesign with structures to initiate new activities, human capacity building, acquiring state-of-the-art laboratory facilities, strengthening infrastructure, massive use of IT-enabled systems and services, simplification of work procedures, and transparency to build confidence with industries and the public.

3.2 Summary of Industry Feedback and Observations on the Regional Offices

Annexe 12 gives a summary of feedbacks obtained from the industry personnel during the visit to various industrial units. The Annexe also summarizes our observations on the state of pollution control practised by the units in the regions administered by the regional offices. Below we give a summary of our observations on the activities of the regional offices and the status of pollution control in the industrial units of the state.

The regional offices have done a very commendable work considering that they have to cover large geographical areas and a large number of industrial units with disproportionately small number of technical staff and with less-than-adequate laboratory and physical infrastructure.

The industrial units have generally responded to the requirements set forth before them by the Board. The response time had not always been very small, though. With the widely publicized coercive means, the units (mostly the large- and medium-scale units) have become quite aware of the needs and their responsibilities for pollution control and environmental-friendly practices.

Much more, however, needs to be done to strengthen the regional offices if the vision of the Board has to succeed. The regional offices are the ones who collect information and ensure that the directives are well implemented. The skill level of the scientific and engineering staff must be updated continuously and their resource strength should be augmented many times. They should be equipped with state-of-the-art laboratories and computer and communication facilities. The scientists and engineers should be able to analyze test data and draw useful conclusions regarding the nature of pollution problems in the years to come and give useful recommendations to prevent environmental hazards.

The regional offices can be the agents to bring about plant-plant and industry-industry coordination to solve common problems. They should organize interactive sessions with the officers of the units, compile their common pollution-related problems, and recommend solutions to these problems. They should also conduct benchmarking studies on environment-related practices, document the best practices, and

publicize them. Also, the regional offices are the best placed to bring about environment-oriented partnership between the Board and the community to help monitor release of toxic substances.

The focus of the regional offices has been more on the large- and the medium-scale industrial units, not on the small-scale units. This focus has to change. They have to make the micro- and small-sector units aware of the need and their responsibilities with regard to pollution prevention and control and suggest affordable ways to discharge them.

3.3 Summary of Responses to the Questionnaire for the Regional Officers

As stated earlier, Annexe 9 documents the responses of the regional officers in the questionnaire survey. A summary of the responses is given below.

3.3.1 Factors Underlying Success

The regional offices have generally performed admirably well, and they highlighted their success stories as part of their response to the questionnaire. Factors underlying these successes are varied. Some of the important factors are: Implementation of CREP regulations by regular follow up, monitoring, and persuasion, coordination with other government agencies and district administration, follow up on the implementation of Board's direction to phase out pollution-generating equipment, working on the issues raised during Public Hearing, introduction of Bank Guarantee Scheme, issue of show-cause and closure notices in selected cases.

3.3.2 Factors Underlying Failure

Regional offices also had failure stories to share. The factors underlying these failure stories are mainly related to: inadequate manpower, facilities, and funds at the regional offices (insufficient number of scientists, engineers, and laboratory personnel, inadequate work space for laboratory, non-availability of sampling kits, continued use of old vehicles to cover wide space, lack of funds for conducting awareness programmes). Difficulty to take action against units in unorganized sectors which face severe shortage of funds in implementing pollution control programmes and against sister government departments is another major difficulty in achieving success.

3.3.3 Anticipated Environment-related Problems

Regional offices are best located to anticipate environment-related problems. The major environment-related problems are likely to stem from mining and mineral-based industries, power plants, stone

crushers, and from urbanization. The regional offices apprehend that these problems will accentuate in the future. A sample of these problems are: increased SPM concentration in the ambient air, large overburden, rehabilitation of dumps and mining quarries, contamination of water sources, degradation of land profile, depletion of ground water, and dust emission problem (all in mining industry); fly ash problem, depletion of fresh and ground water, emission of increased volume of carbon dioxide, increased ambient temperature (all in thermal power plants); sewage, municipal solid waste, air pollution due to vehicular emission, traffic congestion, etc. (all due to urbanization).

3.3.4 Ways to Strengthen Regional Offices

Regional offices need to be strengthened. They act like nerves that monitor the local activities and transmit the information to the Head Office. They take local decisions. They implement the decisions of the Board. Unless they are strengthened, the Board cannot function effectively.

The regional offices should be more in number, should have more skilled professionals and better laboratory facilities, and should be provided with online monitoring equipment and adequate information and communication related technological support. The job of regional offices should be enriched to do carrying-capacity studies for their regions, put up regional environment-related information on the Web, and to carry out studies for cause-effect analysis and environmental projections

4.0 Components of the Vision 2030 Document

4.1 The Hierarchy of Strategic Intent of an Organization

Strategic intent defines the purpose of an organization and the ends it pursues. The strategic ends pursued by an organization can be organized as a hierarchy of strategic intent. The elements of this hierarchy are: Vision, Mission, Goals, Objectives, and Strategies. Figure 4 shows the hierarchy in terms of these elements. These elements set forth the ideals and aspirations of the organization that unify the energy and the forces scattered throughout the organization, provides the sense of directions for action, and serves as the starting points for any formal planning process.

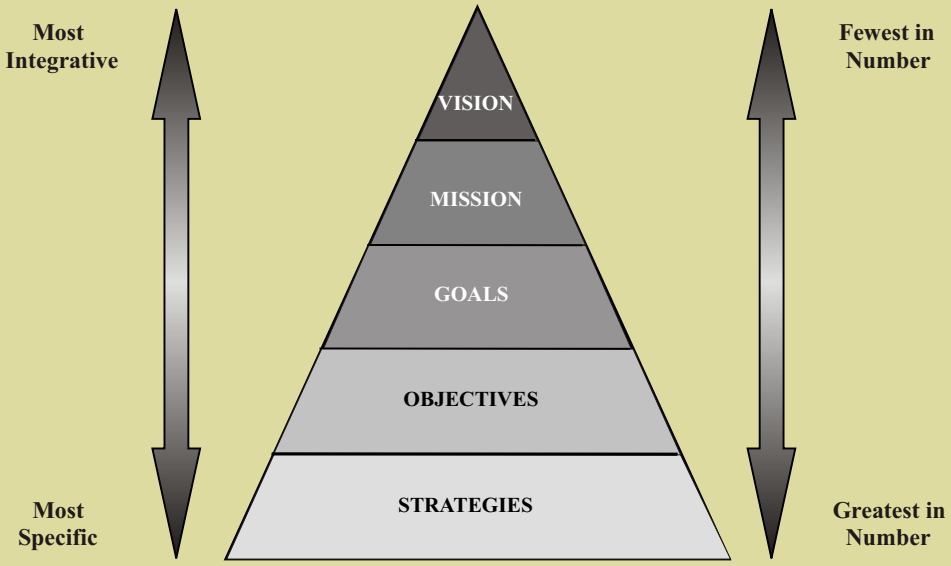


Fig. 4: The Hierarchy of Strategic Intent

Core values are central to every organization. No plan can be realized if the core values are not adhered to by the members of the organization.

The individual components of the Vision 2030 document are discussed below.

4.2 The Vision

A vision of an organization is a dream, an aspiration, a passion, a shared mental image of some ideal future state, a foresight of an aggregate future, and an emotional appeal to the members of the organization that inspires them to think big. A vision does not specify the means to achieve it. It is often too ephemeral and ideal to be written down on paper and is, therefore, not always made public.

VISION

To help Orissa pursue its cherished aspiration of sustainable development with its inhabitants and their future generations assured to breathe clean air, drink safe water, and live in healthy environment.

4.3 The Mission

A vision becomes more tangible in the form of a mission statement. A mission statement gives vent to the organization's beliefs, explicates its thrust and underlying design, and gives broad directions in which the organization will be navigated. It addresses the organization's most fundamental intentions expressing (1) its obligation to stakeholders, (2) the scope of the organization, and (3) the skills to develop and the principal means to adopt to achieve the vision.

A mission statement for the Board is stated as follows:

MISSION

State Pollution Control Board, Orissa shall develop its capability to address environmental challenges emanating from the industrial and economic development of the state of Orissa. It will proactively design innovative predictive, preventive, and regulatory mechanisms for environmental management and will be responsive to all its stakeholders.

4.4 The Core Values

Values are abstract concepts such as principles and qualities that are considered inherently good, meaningful, and valuable. Core values are values that the members of an organization hold uncompromisingly. They are the commonly held beliefs, mindsets and assumptions that shape how an organization behavesthe organizational culture. They govern the organization's preferred mode of conduct and how decisions and actions are taken in the organization.

Brainstorming among the officers of the Board has resulted in the following core values for the Board:

CORE VAUES

Transparency:	All the monitored data, regulations, notifications, decisions, and actions will be made public through the Web and publication.
Rationality:	Decisions will be based on actual data and on the basis of conside red evaluation of decision alternatives.
Consistency:	Decisions will be the same for similar types of problems.
Efficiency:	Delays in decisions and actions will be kept to a minimum.
Honesty:	The decisions and actions of the Board employees will be base d on honesty and other ethical considerations.
Teamwork:	All decisions will be the outcome of collective decision making.
People-friendliness:	All acts of the Board will be geared to benefit the people.
Pro-activity:	The Board will predict likely future environmental hazards and will take preventive actions.
Partnership:	The Board will partner with industries, institutions, and community to leverage knowledge, ideas, and resources.
Innovation and Excellence:	The Board will innovate new ways to achieve excellence in delivering its services.

4.5 The Long-Term Goals

Goals expand on the theme of the mission, making it more concrete. They are long term in nature, are indicative of high-level aspirations of an organization, are focused, precise, and compact, and reflect coherent aggregative purposes of the organization. They give expression to important directions in which the organization should work for. They should conform to social and ethical codes accepted by society and should correlate and be mutually supporting.

Many rounds of questionnaire survey and brainstorming resulted in the following goals for the Board:

Goal 1: **Play the statutory *regulatory* role entrusted to the Board by designing innovative ways of compliance management and enforcement.**

Goal 2: **Develop as the apex body of pollution control and environmental conservation and address the challenges of the present and the future.**

Goal 3: **Develop as a learning organization with capability to take up research and development activities and play *advisory* and *educational* roles in matters of environmental management.**

Goal 4: **Evolve and practise novel service design and delivery mechanisms to facilitate community participation and ensure stakeholder satisfaction.**

Goal 5: **Develop adequate physical, manpower, organizational, and management resources to be able to achieve the above-mentioned goals effectively.**

Goal 1 reaffirms the primary responsibility of the Board to fulfil the task of prevention, monitoring, control, and abatement of water, air, and land pollution. The Board has to innovate ways and means to make the task of regulation and control more comfortable and easy and to achieve greater performance efficiency.

Goal 2 demands that the Board anticipates the future environmental challenges and proactively prepares itself to address them.

Goal 3 is a natural outcome of the activities and the innate strengths of the Board. Compliance management associated with the regulatory role is inherently unexciting for the technically strong team of professionals of the Board. The physical and intellectual resources available make it natural for the Board to make consolidated efforts to play the advisory and educational roles in very effective ways.

Pollution generators adversely influence the state of environment and affect the community life. Thus the two most crucial stakeholders of the Board are: (1) the Polluters and (2) the Community. Goal 4 emphasizes that the Board has to carefully design its services and service delivery mechanisms to capture the voice of the community and to induce the potential polluters to take preemptive steps to overcome a possible threat to environment.

Goal 5 stresses that to effectively play the regulatory, advisory, and educational roles, the Board must build up its capacity in terms of laboratory equipment, skilled manpower, an enabling organizational set up, and a proactive set of management policies.

4.6 The Short-Term Objectives

Each goal must be exploded into short-term objectives to be acted upon and realized. Objectives must be aligned with the goals, and must be focused, measurable (quantifiable so as to monitor progress towards a target or a benchmark), and attainable within a specified timeframe.

As mentioned earlier, once a consensus with regard to the five broad long-term goals of the Board was achieved, the scientists and engineers were divided into five teams, with each team assigned to a specific goal. Each team brainstormed and helped in exploding the assigned goal into objectives. The author had meetings with the teams separately to give shape to an initial list of objectives for each goal. This list underwent a number of changes at various rounds of brainstorming sessions to reflect the Orissa-specific nature of industrial growth and likely futuristic environmental issues. Altogether there are 36 objectives, with 7 objectives for Goal 1, 13 for Goal 2, 6 each for Goal 3 and Goal 4, and 4 objectives for Goal 5. Below we give an outline of the issues relevant to each long-term goal before giving the corresponding short-term objectives.

4.6.1 The Short-Term Objectives for Goal 1

Compliance management is a primary role of the Board. To achieve this goal effectively, the Board needs to develop a monitoring system (with which to detect non-compliance fast) and design an enforcement system that is rational, objective, and consistent, and therefore predictable. The monitored data provide an opportunity for statistical analysis in order to localize origins of problems and to arrive at their long-term solutions. The Board also needs to widen its scope of compliance management responsibility for hazardous and bio-medical wastesareas which have not been given their due attention up till now. The Board has to ensure that its consent management system is fast and user-friendly, and it has to design an appropriate reward system to motivate industries to exercise self-control in matters of pollution generation and management.

The final list of objectives for Goal 1 is given below.

Goal 1: Play the statutory *regulatory* role entrusted to the Board by designing innovative ways of compliance management and enforcement.

1.1 Design an efficient, user-friendly, and quick-response consent management system to enable industrial units to obtain Consent to Establish and Consent to Operate in four weeks.

1.2 Establish a compliance monitoring system with rationally set norms and a mechanism for fast detection of non-compliance.

1.3 Design an objective, efficient, predictable, consistent enforcement system.

1.4 Scientifically analyze the monitored data.

1.5 Design appropriate reward systems to motivate industrial units to be willing partners in the prevention, control, and abatement of pollution.

1.6 Develop and implement appropriate measures of hazardous waste management.

1.7 Develop an enforcement mechanism for effective biomedical waste management in accordance with the provisions of the Biomedical Waste (Management and Handling) Rules, 1998.

4.6.2 The Short-Term Objectives for Goal 2

The present environmental challenges for the Board emanate from the unprecedented industrial and economic growth taking place in the state. This growth has mainly taken place around the natural endowments of the state. Thus the environmental management practices in mining and mineral processing, iron and steel, aluminium, power, infrastructure, and in marine and coast-based industry sectors must continue to be the primary focus of the Board. The resulting problems of solid waste management and water pollution must also capture the imagination of the Board officials.

Growth of industrial estates and of small-scale industry sector is expected to continue unabated and hence environment management of these activities must constitute one of the significant environment management plans of the Board.

Good environment management calls for an area-specific studies. Also the global concern for greenhouse gas emission has to be consciously addressed by the Board.

The final list of objectives for Goal 2 is given below.

Goal 2: Develop as the apex body of pollution control and environmental conservation and address the challenges of the present and the future.

2.1 Improve environmental management practices in mining and mineral processing sectors.

2.2 Improve environment practices in iron and steel sector.

2.3 Develop environment practices in aluminium sector.

2.4 Improve environment management practices in the Power sector.

2.5 Develop a focused and well-packaged regulatory program for sector- and area-specific small- and medium-scale industrial units.

2.6 Develop environmental guidelines for establishment and operation of industrial estates.

2.7 Expand and strengthen the regulatory toolkit to address environmental problems arising out of diverse, non-point pollution sources.

2.8 Design effective area-specific pollution management programmes.

2.9 Provide technical assistance to urban local bodies for effective environment management.

2.10 Design a holistic approach for management of high-volume solid wastes.

2.11 Prepare a strategic approach to maintain marine environmental quality.

2.12 Address the problems owing to emission of green-house gases.

2.13 Plan and implement comprehensive measures for prevention and abatement of water pollution and maintain wholesomeness of water bodies.

4.6.3 The Short-Term Objectives for Goal 3

A unique characteristic of the Board is that it is perhaps the only government department where the most of its officers possess Ph.D. degree and are engaged in high-caliber, knowledge-based work, having to heavily use their mental faculty and very sophisticated instruments. To keep up the tempo and to render a world-class performance, the Board has to provide an enabling environment by building its intellectual capacity. The Board can then play its educational and advisory roles very successfully. To play these roles, the Board has to engage itself in more intensive research and development activities and impart training to potential pollution generators. It has to be a storehouse of information on technologies and on their environmental implications. And it has to give wide publicity about its achievements and potential.

The final list of objectives for Goal 3 is given below.

Goal 3: Develop as a learning organization with capability to take up research and development activities and play *advisory* and *educational* roles in matters of environmental management.

3.1 Impart training in the field of environment management to the stakeholders of the Board.

3.2 Evolve as the hub of information on the best available technologies in respect of process and pollution generation.

3.3 Build capacity on environmental economic analysis.

3.4 Develop a system of providing inputs to the state government in matters of policy formulation with regard to environmental management.

3.5 Conduct research and development in selected areas of environmental management and pollution control.

3.6 Publicize the technical capabilities and achievements of the Board.

4.6.4 The Short-Term Objectives for Goal 4

Stakeholder satisfaction holds the key to success of any organization. The Board is no exception. Community, being the affected party, is the most important stakeholder of the Board. Engaging the community in various aspects of environment management should be the uppermost for the Board. Capturing community expectation, generating its environment awareness, enhancing its participation in the environment management programme, and disseminating Board guidelines should be some of the objectives of the Board.

The final list of objectives for Goal 4 is given below.

Goal 4: Evolve and practise novel service design and delivery mechanisms to facilitate community participation and ensure stakeholder satisfaction.

4.1 Capture public expectation on local environmental issues and incorporate them in the regulatory framework of Consent to Establish and Consent to Operate.

4.2 Enhance public participation in addressing environmental issues.

4.3 Disseminate guidelines developed by the Board to facilitate compliance by industries and for public scrutiny.

4.4 Generate public awareness to facilitate an informed interaction of the community in the regulatory process.

4.5 Develop guidelines on public participation and provide training on such participation to Board personnel and to concerned authorities of the State.

4.6 Prepare pollution control guidelines, disseminate information, generate awareness, train stakeholders, take up public grievances, and resolve conflicts.

4.6.5 The Short-Term Objectives for Goal 5

To play the roles effectively and to meet the various goals and objectives cited earlier, the Board has to build up its intellectual, infrastructural, organizational and managerial capabilities.

The final list of objectives for Goal 5 is given below.

Goal 5: Develop adequate physical, manpower, organizational, and management resources to be able to achieve the above-mentioned goals effectively.

5.1 Build up a skilled manpower base to effectively perform the regulatory, advisory, and other roles as bestowed on the Board in its statutes and as outlined in this document.

5.2 Develop adequate infrastructure (including Library, Laboratories, and IT-enabled system) at the Head Office and at the regional offices to match the demand of the workload resulting from the rapid industrialization of the state and to effectively carry out the desired functions.

5.3 Strengthen the organizational framework to perform challenging functions and create an enabling work environment.

5.4 Design management policies for optimal utilization of organizational resources.

4.7 Strategies

Once the short-term objectives are formed, strategies must be formulated so that appropriate rules for making decisions and actions can be taken to achieve the objectives. Formulating strategies are prelude to decision making and planning for action. In technical terms, a strategy is specified under conditions of partial ignorance (of alternatives, for example). Strategies are defined at various levels of an organization: Operations level strategy (also called operating policy), Administrative strategy, and Business strategy (Ansoff [1]). Business strategy deals with the organization's relationship with its external environment, administrative strategy deals with establishing the internal relations and processes within the organization, and operations level strategy deals with the organization's day-to-day functions. In this report, we do not distinguish among these three forms of strategy. Instead, we take a contingency approach to strategy formulation, i.e., we formulate a strategy as the most logical and viable means to achieve each identified objective, irrespective of whether it is at the level of operations or administration or business.

Formulation of strategies, unfortunately, does not follow any specific, standard set of steps. To select the strategies for an objective, two methods were followed: (1) recommendations given in the literature and reported in various reports were searched and (2) a series of brainstorming sessions were conducted among the officers of the Board.

There were altogether 207 strategies. Their distribution among the objectives is given in Table 1.

Table 1 Objective-wise Distribution of Strategies

Goal 1		Goal 2		Goal 3		Goal 4		Goal 5	
Obj No	**No. of Strategies**	**Obj No**	**No. of Strategies**	**Obj No**	**No. of Strategies**	**Obj No**	**No. of Strategies**	**Obj No**	**No. of Strategies**
1.1	**9**	2.1	**10**	3.1	**2**	4.1	**3**	5.1	**6**
1.2	**6**	2.2	**5**	3.2	**3**	4.2	**3**	5.2	**10**
1.3	**4**	2.3	**3**	3.3	**3**	4.3	**2**	5.3	**5**
1.4	**5**	2.4	**9**	3.4	**5**	4.4	**5**	5.4	**6**
1.5	**3**	2.5	**9**	3.5	**4**	4.5	**3**		
1.6	**11**	2.6	**6**	3.6	**4**	4.6	**5**		
1.7	**6**	2.7	**7**						
		2.8	**6**						
		2.9	**14**						
		2.10	**9**						
		2.11	**8**						
		2.12	**5**						
		2.13	**3**						
Total: 44			**94**		**21**		**21**		**27**
Grand Total: 207									

It is thus clear that goals explode into objectives, and objectives explode into strategies. Figure 5 shows the form of explosion that has taken place for Goal 1.

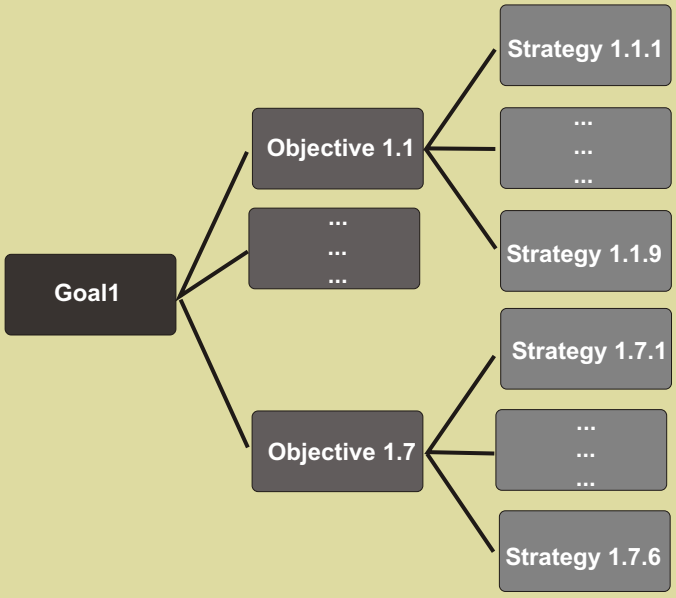


Fig. 5: The Goal-Objective-Strategy Tree

4.8 Prioritization and Time-Phasing of Objectives and Strategies

The vision document was developed for a period of twenty years. It was necessary to prioritize the identified objectives and strategies with regard to the time period (years) in which the Board will make conscious effort to acquire and deploy resources and follow the desired strategies to achieve the objectives. The twenty-year planning horizon was divided into four periods:

1ST Phase	:	Period I	2010 - 2015
2nd Phase	:	Period II	2015 - 2020
3rd Phase	:	Period III	2020 - 2025
4th Phase	:	Period IV	2025 - 2030

Prioritization and time-phasing were done keeping in mind the following:

The perceived importance of the issue

The present strength of the Board in terms of resources and skills

The time to build up the capability

The likelihood of an objective to be achieved to different degrees of intensity in more than one period with a few strategies for the objective adopted during a period and the remaining strategies of the same objective adopted during the next or the succeeding periods

The uniformity of distribution of the objectives among the periods

Table 2 gives an index of time-phased strategies corresponding to each objective. Here the numbers 1, 6, and 9 appearing in the row for objective number 1.1 and column for time phase I indicates the strategies 1.1.1, 1.1.6, and 1.1.9 (corresponding to Objective 1.1 for Goal 1) to be adopted in period I (i.e., during the years 2010 and 2015).

A look at Table 2 indicates crowding of strategies in time phase I. This is not an imperfection in the time-phasing of the strategies. It only indicates the present preparedness of the Board to implement a large number of strategies during the first five years. The more challenging strategies require more effort, greater infrastructure, and more skilled employees, and openness of the stakeholders to cooperate with the Board to address the environmental challenges and are thus delegated to the future periods.

Table 2: Index of Time-Phased Strategies

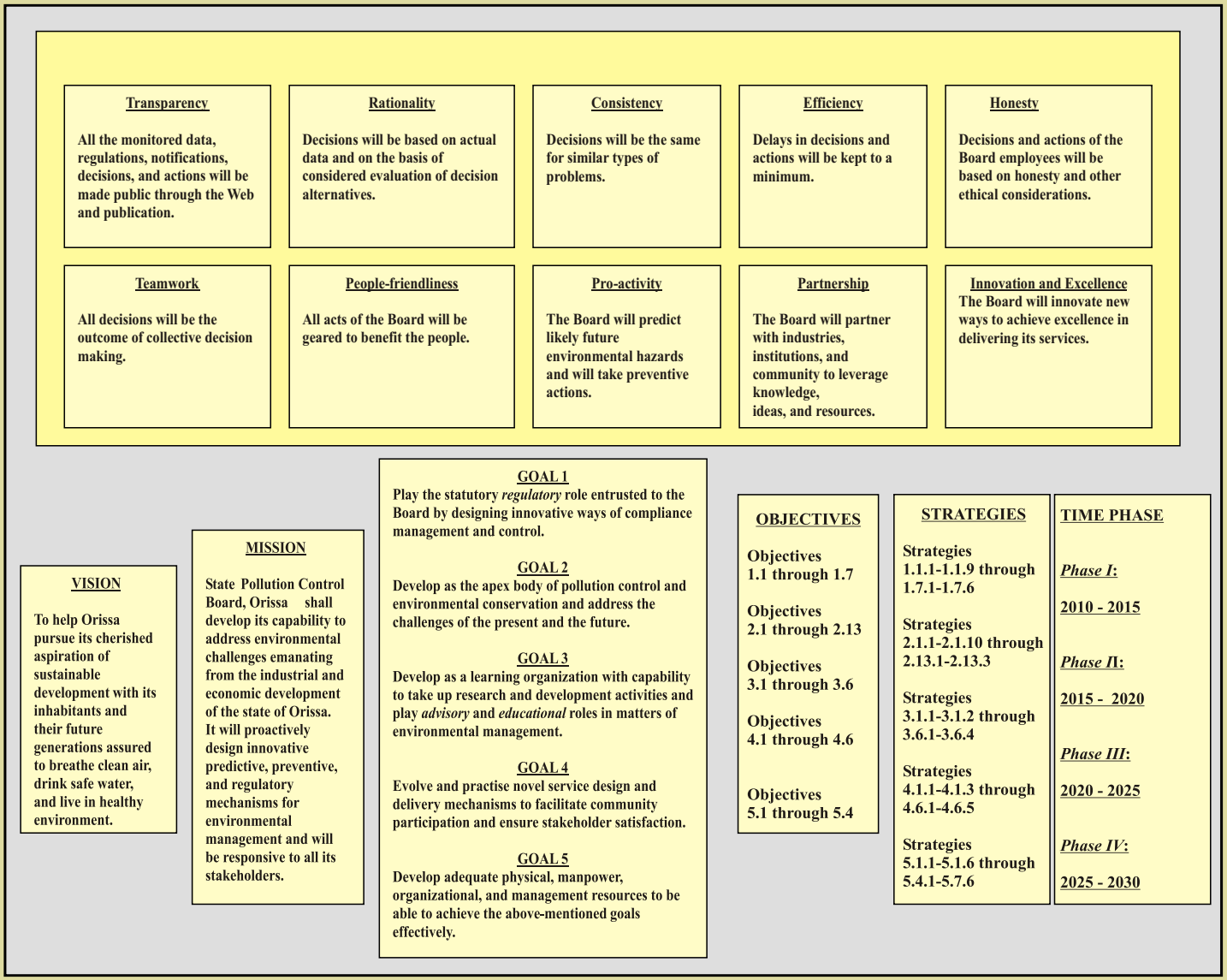
Goals	Objectives	Time Phase			
		I	II	III	IV
		Strategy Number for the Objective Appearing in the Row			
1	1.1	1,2,3	4,5,6,7	4,8,9	
	1.2	1,2,3	1,2,4	5,6	5
	1.3	1,2, 3, 4			
	1.4	1, 2, 3, 4, 5			
	1.5	1	2	3	
	1.6	1,2,3,4,5	2,3,4,6,7	7,8,9	10,11
	1.7	1, 2, 3, 4, 5, 6			
2	2.1	1, 2, 3, 4, 5	6	7, 8	9, 10
	2.2	1	2, 3	4	5
	2.3	1, 2, 3			
	2.4	1, 2	3, 4, 5, 6		7, 8, 9
	2.5	1, 2, 3, 4	5, 6	7, 8	9
	2.6	1, 2, 3	4	5	6
	2.7	1	2	3, 4	5, 6, 7
	2.8	1, 2, 3	4, 5		6
	2.9	1, 2, 3	4, 5, 6, 7, 8	9, 10, 11	12, 13, 14
	2.10	1, 2, 3, 4	5, 6	7, 8, 9	
	2.11	1, 2, 3	4, 5	6	7, 8
	2.12		1, 2	3	4,5
	2.13		1	2	3
3	3.1	1, 2			
	3.2	1	2		3
	3.3		1	2	3
	3.4	1,2,3	4	5	
	3.5	1	2, 3	4	
	3.6	1, 2, 3, 4			
4	4.1		1, 2	3	
	4.2	1		1, 2	3
	4.3	1	2		
	4.4	1, 2, 3, 4, 5			
	4.5		1, 2	3	
	4.6	1, 2, 3, 4, 5			
5	5.1	1, 2, 3, 4, 5, 6			
	5.2	1, 2, 3, 4, 5, 6	7, 8, 9, 10		
	5.3	1, 2, 3, 4, 5			
	5.4	1, 2, 3, 4, 5, 6			

5.0 The Vision 2030 Document

The Vision 2030 document is given in tabular format in the following pages. The document encompasses the goals, the objectives for each goal, the strategies to be adopted to achieve goal, and the periods in which the strategies are to be adopted to achieve each objective. In the format, columns indicate periods and the entries in a column indicate the strategies which would be implemented during the period assigned to that column.

The summary of the Vision-2030 document is given in Fig. 6.

Fig.6: Summary of Vision Document



VISION 2030 FOR STATE POLLUTION CONTROL BOARD, ORISSA

VISION

To help Orissa pursue its cherished aspiration of sustainable development with its inhabitants and their future generations assured to breathe clean air, drink safe water, and live in healthy environment.

MISSION

State Pollution Control Board, Orissa shall develop its capability to address environmental challenges emanating from the industrial and economic development of the state of Orissa. It will proactively design innovative predictive, preventive, and regulatory mechanisms for environmental management and will be responsive to all its stakeholders.

CORE VALUES

Transparency: All the monitored data, regulations, notifications, decisions, and actions will be made public through the Web and publication.

Rationality: Decisions will be based on actual data and on the basis of considered evaluation of decision alternatives.

Consistency: Decisions will be the same for similar types of problems.

Efficiency: Delays in decisions and actions will be kept to a minimum.

Honesty: The decisions and actions of the Board employees will be based on honesty and other ethical considerations.

Teamwork: All decisions will be the outcome of collective decision making.

People-friendliness: All acts of the Board will be geared to benefit the people.

Pro-activity: The Board will predict likely future environmental hazards and will take preventive actions.

Partnership: The Board will partner with industries, institutions, and community to leverage knowledge, ideas, and resources.

Innovation and Excellence: The Board will innovate new ways to achieve excellence in delivering its services.

Goal 1: Play the statutory regulatory role entrusted to the Board by designing innovative ways of compliance management and enforcement

<table>
<tr><th colspan="4">Objective: 1.1 Design an efficient, user -friendly, and responsive consent management system to enable industrial units to obtain Consent to Establish and Consent to operate in four weeks.</th></tr>
<tr><th colspan="4">Strategies</th></tr>
<tr><th>1st Phase (2010-2015)</th><th>IInd Phase (2015-2020)</th><th>IIIrd Phase (2020-2025)</th><th>IVth Phase (2025-2030)</th></tr>
<tr><td rowspan="2">1.1.1 Follow a common entry, single stream consent management system with regional offices as the entry points.
1.1.2 Empower the Regional Offices to decide on the Consent to Operate applications, with the Head Office handling the exceptional cases.
1.1.3 Periodically review the way the consent management system is implemented in practice and revise the process if necessary.</td><td colspan="2">1.1.4 Prepare guidelines for environmental audit for specific industries and periodically carry out environmental audit for medium and large industrial units.</td><td rowspan="2"></td></tr>
<tr><td>1.1.5 Develop well-designed and transparent guidelines for specific micro- and small-scale industrial sectors.
1.1.6 Explore (by conducting seminars and workshops and through mutual consultations) and define common problems of specific sets of industrial units and devise appropriate pollution control norms and a time-bound compliance programme for each such problem.
1.1.7 Enhance regulatory flexibility (such as extended period of validity of Consent to Operate) if the environmental compliance by a unit is consistently good or if the unit has introduced environmental audit, has acquired ISO 14001, or has established a self-monitoring and self-reporting system under Charter for Corporate Responsibility of Environment Protection.</td><td>1.1.8 Design the consent management system as an inclusive process, with the local community playing a constructive role by registering genuine complaints, participating during public hearing, and by getting involved in the process of granting Consent to Operate.
1.1.9 Constitute a technical advisory committee to address major issues arising out of the consent management system.</td></tr>
</table>

Objective: 1.2 Establish a compliance monitoring system with rationally set norms and a mechanism for fast detection of non-compliance.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
1.2.1 Use, for major polluting industries, (a) advanced onsite monitoring equipment (such as Continuous Emissions Monitoring for stack testing) with facilities to generate and store real time data and retrieve them later on a computer and (b) other devices such as hand held digital meters, portable devices, and mountable monitoring equipment .		1.2.5 Promote a voluntary monitoring and reporting scheme.	
1.2.2 Create a professionally developed web based system (with user-friendly interfaces) that captures monitored data online, updates the data base, allows sharing of the data with the industrial units, presents the data graphically with meaningful interpretations, and permits networking among the head office and the regional offices of the Board to address emerging pollution related issues while sharing as much information with the external stakeholders as possible.		1.2.6 Develop a mechanism so that the local community is aware of the pollution control problems and becomes an active partner in the environmental monitoring process.	
1.2.3 Develop a mechanism of independently crosschecking the monitored data on a random sampling basis.	1.2.4 Enforce submission of Annual Environment Statement from each industrial unit under the Environment Protection Act, 1986.		

Objective: 1.3 Design an objective, efficient, predictable, consistent enforcement system.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
1.3.1 The conditions leading to enforcement measures should be well laid out with no ambiguity and they should be available in public domain. 1.3.2. Delegate, selectively, the power of taking enforcement measures against micro and small industrial units to the regional officers, with provision for appeal. 1.3.3 Use alternative enforcement mechanisms (e.g., the applications of Polluter Pays principle such as the environment performance bond for having violated past agreements and the bank guarantee system as a condition for renewing Consent to Operate for the violators). 1.3.4 Encourage large industrial units to each designate a senior officer as the pollution control officer and make him (or her) responsible for violation of pollution control norms.			

Objective: 1.4 Scientifically analyze the monitored data			
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
1.4.1 Develop a centralize database of monitored data			
1.4.2 Build capacity for data analysis with the help of statistical software packages			
1.4.3 Make statistical analysis of monitored data for the industrial units to scientifically set the warning and action limits and design the frequency of monitoring.			
1.4.4 Forecast the future pollution load in specific areas and identify the critical issues of pollution.			
1.4.5 Carry out multivariate analysis to pin-point important source of pollution.			

Objective: 1.5 Design appropriate reward systems to motivate industrial units to be willing partners in the prevention, control, and abatement of pollution.			
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
1.5.1 Institute awards for good environmental performance and widely publicize the enabling features of best performing units.	1.5.2 Recognize industrial units with ISO 14000 certification or with consistently good environment track records and rationalize either the frequency of monitoring or increase the validity period of Consent to Operate for these units.	1.5.3 Assist industrial units to get easy finance (through global environmental financing instruments such as that for Clean Development Mechanism, Carbon Finance, and Global Environment Facility) for acquiring clean technologies.	

<table>
<tr><td colspan="4">Objective: 1.6 Develop and implement appropriate measures of hazardous waste management.</td></tr>
<tr><td colspan="4">Strategies</td></tr>
<tr><td>1st Phase (2010-2015)</td><td>IInd Phase (2015-2020)</td><td>IIIrd Phase (2020-2025)</td><td>IVth Phase (2025-2030)</td></tr>
<tr><td>1.6.1 Enforce every hazardous waste - generating unit to report details on the generated wastes and the adopted handling and disposal procedures (under the Hazardous Wastes Management, Handling and Transboundary Movement Rules, 2008).</td><td>1.6.6 Help capacity building and upgrading the Laboratory of Customs Department for scientific inspection, sampling, and testing of hazardous materials.</td><td>1.6.8 Design and enforce the implementation of a reverse supply chain and a common treatment, storage, and disposal facility for expired drugs and pesticides.

1.6.9 Ensure adoption of environmentally sound technology for reprocessing of hazardous wastes.</td><td rowspan="4">1.6.10 Design and implement an online system for tracking the movement of hazardous wastes from the stage of generation to the stage of disposal/recovery/ recycle.

1.6.11 Draw up action plans for prevention of discharge of hazardous materials and abatement of resulting air and water pollution at times of natural disasters such as cyclone and flood.</td></tr>
<tr><td colspan="3">1.6.2 Take remedial actions for all contaminated sites.</td></tr>
<tr><td colspan="2">1.6.3 Design and develop common hazardous waste treatment facilities.

1.6.4 Promote hazardous wastes (such as ETP sludge from dye and dye intermediaries, tyre chips, paint sludge, Toluene -Die-Isocynate tar residue and refinery sludge) as supplementary fuels in cement kilns.</td><td></td></tr>
<tr><td>1.6.5 Organize seminars, write popular articles in dailies, and prepare booklets to increase public awareness about hazardous wastes.</td><td colspan="2">1.6.7 Enforce creation of a separate fund by every hazardous material-handling unit for meeting liability due to the resulting mishaps and calamities.</td></tr>
</table>

Objective: 1.7 Develop an enforcement mechanism for effective biomedical waste management in accordance with the provisions of the Biomedical Waste (Management and Handling) Rules, 1998.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
1.7.1 Create a database of all health-care units in the state and their generated bio-medical wastes. 1.7.2 Train and sensitize medical and paramedical staffs in matters relating bio-medical wastes. 1.7.3 Promote reduction, segregation, disinfection, transportation, treatment, and disposal of bio-medical wastes 1.7.4 Promote establishment of adequate number of common bio-medical waste treatment facilities, enforce their use in all health-care units, and evaluate the performance of all such treatment facilities. 1.7.5 Coordinate with the Health Department of the state to formulate a strategy for effective bio-medical waste management. 1.7.6 Design a mechanism to ensure that bio-medical wastes do not get mixed up with municipal solid wastes.			

Goal 2: Develop as the apex body of pollution control and environmental conservation and address the challenges of the present and the future.

Objective: 2.1 Improve environmental management practices in mining and mineral processing sectors.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
2.1.1 Bring illegal mining operations under the fold of environmental management by giving a general amnesty, organizing workshops, and publicizing the simplified consent management procedures 2.1.2 Prepare a comprehensive plan for design of adequate spillway capacity for the tailings pond overflow and for mitigating overflow-related risks. 2.1.3 Develop a procedure for backfilling and restoration of overburden in mining, especially in coal mines. 2.1.4 Develop a solution to the problem of generated fugitive dust and that generated during handling, transport and storage, and enforce its implementation. 2.1.5 Prepare a special action plan for abatement of chromites pollution in Sukinda valley area.	2.1.6 Develop a strategy to identify and manage acid mine drainage and surface runoff and to prevent groundwater depletion and contamination.	2.1.7 Bring in institutional changes to get the restoration and rehabilitation work done by an independent agency and by realizing the incurred cost from the concerned mines. 2.1.8 Promote research and development in the area of storage of tailings and their utilization.	2.1.9 Provide a framework for economic analysis (considering cost of land, local pollution effects, and carbon emission) and support strateg ic R & D efforts for removal of ash from coal at various stages of coal production and processing. 2.1.10Develop an integrated strategy in coordination with other concerned agencies to improve environment quality in mining including mine closure.

Objective: 2.2 Improve environmental management practices in iron and steel sector			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
2.2.1 Compile guidelines for good environment management and enforce their implementation.	2.2.2 Explore areas of enhanced heat utilization and encourage their adoption. 2.2.3 Prepare a long -term action plan to restore and rehabilitate the solid waste dump sites.	2.2.4 Collaborate with academic and research institutes to develop cleaner technologies and devise policies for their effective diffusion.	2.2.5 Wherever necessary, demonstrate the cost effectiveness of an available clean technology to replace an old technology currently used in practice.

Objective 2.3 Develop environmental management practices in aluminium sector			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
2.3.1 Enforce concentration of bauxite tailings and thickening and concentration of red mud before disposing them scientifically. 2.3.2 Establish a framework for auditing fluoride flow, and monitoring fugitive fluoride emission, and preventing fluoride contamination of groundwater. 2.3.3 Develop a mechanism to ensure utilization and safe disposal of hazardous waste generated from aluminium smelter and enforce its implementation.			

Objective 2.4 Improve environment management practices in the Power sector			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
2.4.1 Develop a comprehensive plan for ash disposal, reclamation, and reuse to minimize environmental impact especially the migration of toxic metals to surface and groundwater bodies and transport of suspended solids to surface runoff and to make economic use of the ash wastes. 2.4.2 Promote the use of alternative environment-friendly sources of energy.	2.4.3 Use economic instruments such as tax incentives (for better ash management and for enhanced renovation and modernization in thermal power plants) and tax surcharges (for unutilized fly ash). 2.4.4 Promote supercritical and Integrated Gas Combined Cycle technology for thermal power stations to achieve improved environment performance. 2.4.5 Set a reasonable standard for sulphur dioxide emissions by power plants and encourage the use of low-sulphur coal and fuel oil in thermal power plants. 2.4.6 Insist on a combined environmental audit of existing plant and assessment of alternative rehabilitation options relevant to the future impact of the plant on nearly population or ecosystem whenever a power plant is being rehabilitated.		2.4.7 Insist that proposals for new power plants or capacity additions to existing plants include economic analysis based on costs associated with environmental externalities. 2.4.8 Design a comprehensive process and promote its use for heat recovery from wastewater and flue gas. 2.4.9 Tax the distribution companies for power outage and thus save on the use of diesel generators by domestic and industrial users and on the consequent harmful effects of air pollution.

Objective 2.5 Develop a focused and well-packaged regulatory program for sector- and area-specific small- and medium-scale industrial units			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
2.5.1 Prepare an inventory of unregistered small and medium scale industrial units. 2.5.2 Allow phased and time bound implementation of pollution control measures 2.5.3 Coordinate with industry associations to pool resources from the units and with government departments to provide matching grants, to address problems common to SME clusters. 2.5.4 Encourage the business associations to conduct workshops and seminars on environment awareness and environmental management systems.	2.5.5 Establish an amnesty programme for the unregulated industrial units along with an aggressive inspection campaign and appropriate legal action for the remaining ones, for extensive coverage of the consent management system 2.5.6 Provide training on relevant environmental concerns and highlight business opportunities in the form of reduced production cost, lower lifecycle cost, higher product quality image, and higher sale that arise out of effective environment management system.	2.5.7 Set, and periodically review, the pollution standards on the basis of (a) the national standards, (b) the size, capacity, and pollution potential of the units (c) dialog with the industrial units, and (d) public consultation. 2.5.8 Motivate the large industrial units to take greening supply chain initiatives and to act as environmental mentors for their small SME suppliers.	2.5.9 Develop and provide low-cost and effective solutions to pollution control problems afflicting the units and offer them technical assistance on pollution prevention and waste minimization.

Objective 2.6 Develop environmental guidelines for establishment and operation of industrial estates.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
2.6.1 Play an active role in the preparation of the development plan document for industrial estates by providing environment-related inputs. 2.6.2 Encourage, wherever appropriate, the recovery and recycle of oily wastes and regeneration and reuse of spent catalysts and solvents. 2.6.3 Encourage recycling of cooling water, and of reuse of wastewaters, segregation of storm water from process water, and segregation of sewage water from waste waters containing heavy metals.	2.6.4 Design a framework for including aspects of environment management by identify ing the key environment issues to be addressed through an environment assessment process.	2.6.5 Provide for common effluent and waste management facilities while enforcing the standard discharge and pretreatment guidelines on the individual units	2.6.6 Encourage, wherever appropriate, the use of vapour recovery systems (to reduce volatile organic compounds), sulphur recovery systems, and low-nitrogen oxides burners.

Objective 2.7 Expand and strengthen the regulatory toolkit to address environmental problems arising out of diverse, non-point pollution sources			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
2.7.1 Coordinate with the appropriate authorities to include environmental management measures in the planning phase of the projects.	2.7.2 Identify and prepare an inventory of non-point sources of pollution.	2.7.3 Develop manuals for translating provisions of the Environment Management Plans into contract clauses. 2.7.4 Design institutional solutions to environmental problems for projects requiring inter-sector coordination.	2.7.5 Review international practices with regard to environmental tools for tackling pollution-related problems from non-point sources. 2.7.6 Carry out benchmarking study nationally for identifying the best practices. 2.7.7 Develop standards and guidelines based on international practices, national benchmarks, and the opinions of the stakeholders

Objective 2.8 Design effective area-specific pollution management programmes			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
2.8.1 Carry out area specific - assimilative capacity studies in order to hig hlight the potential pollution risks and facilitate setting up industrial units (including ports and harbours, etc.) in environmentally compatible locations. 2.8.2 Design effective region-specific environment management plans and monitoring programmes 2.8.3 Draw up action plans for critically air polluted areas by defining pollution metrics, periodically measuring their values, attributing generated pollution to sources of pollution, find pollution control measures through the internal and external brainstorming, and enforcing them.	2.8.4 Carry out source apportionment studies for non -complying areas, assess the pollution load, and set load-based standards. 2.8.5 Establish and rationalize area wise monitoring networks and reporting mechanisms.	2.8.6 Impart training to local government and municipal personnel in matters pertaining to pollution generated from non-point sources in the areas.	

Objective 2.9 Provide technical assistance to urban local bodies for effective environment management			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
2.9.1 Coordinate with town planning and urban development authorities to include environmental issues in the planning stage. 2.9.2 Promote separation of bio-degradable and non-bio-degradable solid wastes at the household level. 2.9.3 Prominently display daily monitored values of air quality parameters in cities.	2.9.4 Establish partnership with urban local bodies to bring in a cultural and behavioural change in the community to maintain a pollution - free environment. 2.9.5 Advise and ensure pollution control in high-rise buildings, housing complexes, hotels, institutions, industrial units, commercial complexes, located in urban areas. 2.9.6 Organize the scavengers who collect recyclables by providing them with institutional support. 2.9.7 Promote bio-composting of municipal solid wastes. 2.9.8 Generate awareness about extended producer responsibility concept and help introducing a Producer Take back Act for electronic wastes (such as TV, computer sets, and cell phones), used automobiles, and hazardous wastes (such as batteries and tyres).	2.9.9 Provide technical support for installing and/or upgrading sewage treatment plants in urban local bodies. 2.9.10 Promote co-incineration of wastes in cement kiln and power plants. 2.9.11 Monitor and improve existing municipal dump sites, and carry out environment impact studies of these sites.	2.9.12 Coordinate with the Transport Department of the state government to formulate a strategy for use of CNG/LPG and other clean fuels in critically polluted cities. 2.9.13 Develop a low cost and / or natural system of sewage treatment technology for small towns. 2.9.14 Give incentives to companies for using recycled materials.

Objective 2.10 Design a holistic approach for management of high-volume solid wastes.			
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
2.10.1 Make waste management an essential part of strategic and operational plan for every industrial unit, emphasizing on environment -sensitive design of products, packaging, and processes. 2.10.2 Make an inventory of generated wastes and list their properties and use values in other sectors. 2.10.3 Promote establishment of cement plants and design a system for economic reuse of industrial dust-size wastes in the cement plants. 2.10.4 Develop comprehensive management plans separately for each form of high - volume solid wastes (such as red mud, slag, tailings, gypsum, lime sludge, char, dusts, and fly ash).	2.10.5 Make manufacturers ad distributors of products responsible for collecting, processing, and recycling packaging materials and product containers, with economic incentives for recycled materials. 2.10.6 Enforce planning for wastes (minimization of production, collection, reuse, recycling of wastes, and design of value added products) as part of long term plans for large industrial plants.	2.10.7 Develop a mechanism for waste exchange (i.e., wastes generated in one sector/industry for use in another sector/industry as raw - material or fuel) with the help of industry associations 2.10.8 Create an opportunity for developing markets for waste-based products. 2.10.9 Carry out research on, and popularize, economic use of high - volume low toxic content waste (such as metallurgical slag and granulated slag).	

Objective 2.11 Prepare a strategic approach to maintain marine environmental quality.			
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
2.11.1 Monitor discharges from coastal towns, indu stries, mines, and port activities, and evaluate their impact on the coastal water quality. 2.11.2 Provide necessary scientific and technical information to the Coastal Zone Management Authority. 2.11.3 Coordinate with coast guards on matters of mitigation of oil spill disasters.	2.11.4 Develop best management practices for ports, harbours, and port -based activities, and enforce their implementation. 2.11.5 Coordinate with related authorities for surveillance of water quality and enforcement of relevant laws.	2.11.6 Assess marine resources, and prepare an integrated coastal management plan and coastal vulnerability maps.	2.11.7 Prepare an integrated plan for protection and development of sea beaches. 2.11.8 Regulate handling and management of hazardous wastes (such as used oil, waste oil, asbestos, paint chips, used chemicals, etc.) during dismantling of ships.

Objective 2.12 Address the problems owing to emission of green-house gases.			
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
	2.12.1 Explore and utilize opportunities provided by global climate change financing instruments, such as Carbon Finance. 2.12.2 Collaborate with research institutes to take up appropriate research studies on problems related to non-carbon green house gases.	2.12.3 Create and maintain an inventory of green-house gas emissions.	2.12.4 Motivate the development and adoption of low-carbon economic growth options and low-carbon-generating technologies. 2.12.5 Levy carbon tax.

Objective 2.13 Plan and implement comprehensive measures for prevention and abatement of water pollution and maintain wholesomeness of water bodies.			
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
	2.13.1 Conduct comprehensive studies on critical stretches of rivers and water bodies and prepare a strategy for abatement of pollution.	2.13.2 Prepare protection and rejuvenation plans for lentic water bodies, such as ponds and reservoirs.	2.13.3 Identify contaminated groundwater aquifers and take remedial and preventive measures.

Goal 3: Develop as a learning organization with capability to take up research and development activities and play *advisory* and *educational* roles in matters of environmental management.

Objective 3.1 Impart training in the field of environment management to the stakeholders of the Board.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
3.1.1 Conduct workshops and training programmes, in collaboration with industry associations, for the personnel from industry (particularly the SME personnel) and non -industry sectors to sensitize them in matters of pollution generation, control, and abatement. 3.1.2 Organize workshops for the state government officials to make them aware of various environment issues.			

Objective 3.2 Evolve as the hub of information on the best available technologies in respect of process and pollution generation.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
3.2.1 Subscribe trade journals, newsletters of industry associations, and e-resources to the Library.	3.2.2 Develop a list of proven technologies, along with their environmental impacts, for the needed functions in the state.		3.2.3 Network with reputed R & D laboratories of the world.

Objective 3.3 Build capacity on environmental economic analysis			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
	3.3.1 Develop a framework for making an environmental economic analysis for a new project proposal.	3.3.2 Make environmental economic analysis mandatory for every new project proposal.	3.3.3 Use the framework for economic assessment of environmental damage.

Objective 3.4 Develop a system of providing inputs to the state government in matters of policy formulation with regard to environmental management.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
3.4.1. Construct a formal structure in the organization in the form of a Cell to liaise with the state government in matters of policy formulation. 3.4.2. Integrate environmental objectives with various policies (such as Industrial Policy, Mining Policy, and Water Policy) of the state. 3.4.3 Advise the government to frame regulations with rega rd to environment-related issues concerning municipal wastes, infrastructure (roads and buildings) construction, and micro- enterprises.	3.4.4 Develop a spatial planning framework for environmentally compatible decisions on establishing industrial and economic units.	3.4.5 Institutionalize strategic environmental assessment of the policies and plans of the government.	

Objective 3.5 Conduct research and development in selected areas of environmental management and pollution control.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
3.5.1 Based on an analysis of the monitored data and computed metrics identify the emerging issues of environmental concerns in critical areas.	3.5.2 Create a separate Research Cell to undertake research and collaborate with reputed national and international academic and research institutions to find the causes and solutions to each such emerging issue. 3.5.3 Develop the necessary laboratory facilities and skilled manpower to undertake the research.	3.5.4 Disseminate the research reports and implement the solutions in a time - bound manner.	

Objective 3.6 Publicize the technical capabilities and achievements of the Board			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
3.6.1 Publish, at regular intervals, newsletters and periodicals, highlighting technical capabilities, achievements, and research results. 3.6.2 Publish information, education and communication materials for the benefit of the community and the industry personnel. 3.6.3 Develop web based information resources and update them regularly. 3.6.4 Create a separate Publication Cell for effective implementation of the above-mentioned activities.			

Goal 4: Evolve and practise novel service design and delivery mechanisms to facilitate community participation and ensure stakeholder satisfaction.

Objective 4.1 Capture public expectation on local environmental issues and incorp orate them in the regulatory framework of Consent to Establish and Consent to Operate.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
	4.1.1 Organize seminars to capture public views on local environmental issues. 4.1.2 Carryout public contact programmes in critically polluted areas.	4.1.3 Incorporate the public expectation and views in the regulatory framework in the consent management system.	

Objective 4.2 Enhance public participation in addressing environmental issues			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
4.2.1 Design a process of involving the community in environmental monitoring and enforcement activities.		4.2.1 Design a process of involving the community in environmental monitoring and enforcement activities. 4.2.2 Build the capacity of the community to understand environmental issues and relate them to sector-level activities	4.2.3 Leverage, scale up, and replicate grass-root-level groups across the states.

Objective 4.3 Disseminate guidelines to facilitate compliance by industries and for public scrutiny			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
4.3.1 Organize meetings of representatives of industrial units and general public to address issues arising out of common environmental concerns. .	4.3.2 Prepare and disseminate industry - specific environmental guidelines for the benefit of industry stakeholders and general public.		

Objective 4.4 Generate public awareness to facilitate an informed interaction of the community in the regulatory process			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
4.4.1 Organize seminars on environmental issues in schools, colleges, and community halls. 4.4.2 Prepare video -based recording of success stories and publicize them on the TV. 4.4.3 Participate and sponsor in environment-related radio and TV programmes. 4.4.4 Sponsor live telecast of environment-related programmes. 4.4.5 Develop and distribute information, education and communication materials (such as posters and leaflets).			

Objective 4.5 Develop guidelines on public participation and provide training on such participation to Board personnel and to concerned authorities of the State			
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
	4.5.1 Conduct training programmes for the Board employees on effective public participation techniques of consensus building and conflict resolution. 4.5.2 Conduct environment-related workshops to sensitize the judiciary, legislators, and other government officers of the state.	4.5.3 Develop guidelines on the mechanism of participation of the community in the monitoring of environment, by internal brainstorming and by consulting with the community.	

Objective 4.6 Prepare pollution control guidelines, disseminate information, generate awareness, train stakeholders, take up public grievances, and resolve conflicts			
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
4.6.1 Develop a comprehensive, web-based database on environmental indicators and regularly update the database for public information. 4.6.2 Develop clear procedural guidelines to comply with requests for information under the RTI Act, 2005. 4.6.3 Analyze past assembly questions related to pollution control activities in the state, find repeating patterns, design solutions, and establish quick - response mechanisms with minimal effort. 4.6.4 Disseminate relevant information to the affected communities. 4.6.5 Design dedicated organization structure to undertake the tasks			

Goal 5: Develop adequate physical, manpower, organizational, and management resources to be able to discharge the above-mentioned responsibilities effectively.

Objective 5.1 Build up a skilled manpower base to effectively perform the regulatory, advisory, and other roles as bestowed on the Board in its statutes and as outlined in this document.			
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
5.1.1 Analyze the workload of the Board considering the present and the future urban, industrial, and economic growth plans of the state, and develop a manpower acquisition, deployment, and promotion plan commensurate with the projected workload. 5.1.2 Establish a rational performance evaluation system and a pragmatic human relations policy to ensure career growth of emp loyees within the organization. 5.1.3 Develop the required new skills (e.g., domain area skills such as emerging areas of pollution control, interdisciplinary area skills such as environmental economics and management, and analytical skills such as optimization, statistics and probability, multivariate analysis, and simulation). 5.1.4 Motivate the Board employees to upgrade their skills by attending national and international workshops and conferences, doing doctoral and post-doctoral work, and by publishing papers in reputed journals.	.		

Objective 5.1	Build up a skilled manpower base to effectively perform the regulatory, advisory, and other roles as bestowed on the Board in its statutes and as outlined in this document.		
Strategies			
1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
5.1.5 Upgrade legal capacity of the Board by recruiting adequate number of legal staff, employing external legal consultants, and training the Board officers in legal skills. 5.1.6 Build up a team of highly skilled and motivated support staff by improving their scientific, technical, analytical, and computer and communication skills through in-house and external training.			

Objective 5.2 Develop adequate infrastructure (including Library, Laboratories, and IT -enabled system) at the Head Office and at the regional offices to match the demand of the workload resulting from the rapid industrialization of the state and to effectively carry out the desired functions.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
5.2.1 Develop a state -of-the-art environmental laboratory at the Head Office. 5.2.2 Build up a well -funded and well - furnished library with the most current books, journals and reports and with online access to journals, books, and reports on environmental science, engineering, management, and law. 5.2.3 Provide computers, computer - related accessories, and Internet connection to all officers, technical personnel, libraries, and laboratories. 5.2.4 Procure software packages for statistical analysis, optimization, simulation, and multivariate analysis, GIS and MATLAB software packages, and packages dedicated for air pollution dispersion and water quality modeling.	5.2.7 Enhance e-connectivity by increasing Internet bandwidth. 5.2.8 Acquire and use modern monitoring technologies to carryout area - monitoring programmes. 5.2.9 Develop well-equipped, well-laid out, and well-manned laboratories at the regional offices to cope with the ever-increasing regional testing and analysis requirements. 5.2.10 Build staff quarters for Board employees posted in regional offices.		

1st Phase (2010-2015)	IInd Phase (2015-2020)	IIIrd Phase (2020-2025)	IVth Phase (2025-2030)
5.2.5 Acquire sufficient space and create aesthetically appealing physical infrastructure for the regional offices and provide them with adequate funds to comfortably discharge their responsibilities. 5.2.6 Provide the regional offices with better transport and communication facilities.			

Objective 5.3 Strengthen the organizational framework to perform challenging functions and create an enabling work environment.			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
5.3.1 Develop performance indicators for the Board on matters of environment management. 5.3.2 Design the organization structure on principles of delegation, accountability, and transparency to achieve the organizational goals. 5.3.3 Design dedicated organizational structures by creating additional, separate, full -fledged departments/sections/cells for Non-Point Sources of Pollution, Projects and R&D, MIS & IT, Publication, Public and Government Interface, Surveillance, and Continuing Education. 5.3.4 Periodically carryout an organizational restructuring to reflect the new challenges the Board plans to address from time to time. 5.3.5 Develop the service conditions for Board employees reflecting the knowledge-intensive nature of their work.			

Objective 5.4 Design management policies for optimal utilization of organizational resources			
Strategies			
1st Phase (2010-2015)	**IInd Phase (2015-2020)**	**IIIrd Phase (2020-2025)**	**IVth Phase (2025-2030)**
5.4.1 Formulate and codify a pol icy for establishing and operating Regional Offices. 5.4.2 Review the functions of Head Office and the Regional Offices at least once a year. 5.4.3 Institute awards for the best performing regional offices. 5.4.4 Recognize individual talents of scientists, engineers, and technical and other support staff. 5.4.5 Outsource non-core functions, such as development of web-based systems, and functions that require non -core skills (such as model-based analysis of monitored data) till developed internal resources are adequate. 5.4.6 Automate the Head Office and the regional offices.			

6. Conclusions

The Vision 2030 document is a strategic plan for the State Pollution Control Board, Orissa. It has been developed after taking into consideration the conscious feedback from dominant stakeholders. The scientists and engineers of the Board were intimately involved at all stages of the development of the document. In fact, the vision, the mission, the goals, the objectives, and the strategies and their time-phasing prioritization, which appeared in the document, mirror the scientists' and engineers' shared values and views.

The administrators of the Board have exhibited admirable leadership to have sponsored the development of the Vision 2030 document. To convert the aspirations expressed in this document, they have to continue to provide the required leadership, build up the intellectual and infrastructural capacity, restructure the organization, make medium- and short-term plans, allocate requisite resources, assign specific responsibilities, design appropriate monitoring and control plans, and make detailed action plans to implement the individual strategies.

Any strategic plan has to be dynamic in nature. This is also true for the Vision 2030 document. What appears in this document is not sacrosanct. The document reflects the dominant mental images of the stakeholders of the Board with regard to the environmental challenges resulting from the industrial and economic development of the state. Such development is not always comprehensible and is likely to undergo major deviations from the pattern visualized by the document development team. Therefore, it is desirable that this document should be critically evaluated periodicallyfor example, after every five yearsand modifications, if any, must be carried out by undertaking a fresh strategic planning exercise.

References

[1]. Ansoff, I. (1987), Corporate Strategy, Penguin Group, London, Revised Edition.

[2]. Boralkar, D. (2005), Developing a Vision Statement: Maharashtra Experience, Powerpoint Presentation slides, National Colloquium on Strategic Planning for Pollution Control Boards in India, 2729 May 2005, Mumbai.

[3]. Central Pollution Control Board (2001), Zoning Atlas for Siting of Industries (Based on Environmental Considerations), Cuttack, Kendrapara, Jagasingpur & Jajpur Districts (Orissa), Central Pollution Control Board, State Pollution Control Board, Orissa, November 2001.

[4]. Central Pollution Control Board (2002), Zoning Atlas for Siting of Industries (Based on Environmental Considerations), Cuttack, Kendrapara, Jagasingpur & Jajpur Districts (Orissa), Environmental Planning & Mapping Series: EMAPS/19/2001 2002.

[5]. Cyert, R. M. and March, J. G. (1963), A Behavioural Theory of the Firm, Prentice-Hall, Englewood Cliffs, New Jersey.

[6]. Environment & Pollution Control Department, IFFCO Paradip (Undated), Powerpoint Presentation Slides.

[7]. Government of India (1974), The Water (Prevention and Control of Pollution) Act, 1974 Chapter IV Powers and Functions of Boards, [Act 6 of 1974].

[8]. Government of India (1981), The Air (Prevention and Control of Pollution) Act, 1981 Chapter III Powers and Functions of Boards, [Act 14 of 1981].

[9]. Government of India Ministry of Environment & Forests (2006), National Environment Policy 2006.

[10]. Government of Orissa (2007), The Orissa Gazette, No 349, March 2, 2007.

[11]. Gujarat Pollution Control Board (2006), Making a Vision Statement, Forests & Environment Department, Gandhinagar.

[12]. Maharashtra Pollution Control Board (2005), Institutional Capacity Building, Final Report, August 2005.

[13]. Miller, A. (1998), Strategic Management, The McGraw-Hill Companies, Inc., International Edition.

[14]. Parida, B. D. and Pattajoshi, B. P. (Undated), Compilation of Some Selected Laws Relating to Environment Protection, State Pollution Control Board, Orissa.

[15]. Regional Office, State Pollution Control Board, Orissa, Sambalpur, (2009), Status of Industries & Mines of Sambalpur & Jharsuguda District, Document Submitted to Hon'ble House Committee on Environment, Orissa Legislative Assembly, January 2009.

[16]. State Pollution Control Board, Orissa (Undated-a), Analytical Facilities of State Pollution Control Board, Orissa 2005.

[17]. State Pollution Control Board, Orissa (Undated-b), Annual Report 2006-2007.

[18]. State Pollution Control Board, Orissa (Undated-c), Action Plan 2007-2008.

[19]. State Pollution Control Board, Orissa (Undated-d), Paribesh Samachar, Foundation Issue of the Silver Jubilee Year, Vol. XIV, No. 2, September 2008.

[20]. State Pollution Control Board, Orissa (Undated-e), Vision 2020, Draft.

[21]. State Pollution Control Board, Orissa (2008), Silver Jubilee Souvenir, 14th September 2008.

[22]. State Pollution Control Board, Orissa (2008), Strengthening and Capacity Building of State Pollution Control Board, Orissa, July 2008.

[23]. Steiner, G. A., J. R. Miner, and E. R. Gray (1989), Management Policy and Strategy: Text, Readings, and Cases, Maxwll Macmillan International Editions, Singapore, Third Edition.

[24]. The World Bank (1999), Pollution Prevention and Abatement Handbook: Toward Cleaner Production, Washington.

[25]. The World Bank (2006a), Institutional Capacity Needs Assessment - Building Partnership for Sustainable Development: Orissa Growth and Environment Study Draft Report Volume 1, February 2006.

[26]. The World Bank (2006b), Institutional Capacity Needs Assessment - Building Partnership for Sustainable Development: Orissa Growth and Environment Study Draft Report Volume 2, February 2006.

[27]. The World Bank (2007a), Strengthening Institutions for Sustainable Growth: Country Environment Analysis for India, South Asia Sustainable Development Unit, April 2007.

[28]. The World Bank (2007b), India: Towards Sustainable Mineral-Intensive Growth in OrissaManaging Environmental and Social Impacts, Environment UnitSocial, Environment & Water Resources managementSouth Asia, Report No: 39878-IN, May 30, 2007.

[29]. Vedanta Aluminium Limited (Undated), PowerPoint Presentation Slides.

ANNEXURES

1

Questionnaire-1 Used for Eliciting the Views of the Board Employees

1. Why is a Vision document needed to be developed?
2. Who will be the users of this document?
3. In what ways will the document be used?
4. What roles does the Board play at the present?
5. What new roles will the Board play in the next two decades?
6. How efficiently does the Board function?
7. What strategies does the Board follow at the present?
8. What are the major strengths of the Board?
9. What are the major weaknesses of the Board?
10. What are the challenges before the Board in the next two decades?

2

Questionnaire-2 Used for Eliciting the Views of the Board Employees

1. How can the performance of the Board be evaluated?

2. What are the performance indicators of the Board?

3. What are the enabling factors of the performance of the Board?

4. What are the inhibiting factors of the performance of the Board?

5. What strategies are being adopted by the present for performance enhancement?

6. What new strategies should the Board follow to effectively perform the new roles?

List of Regional Offices and Companies Visited

Jharsuguda (January 17-19, 2009)

1. Regional Office of State Pollution Control Board, Orissa at Sambalpur
2. M/s Bargarh Cement Works (ACC Ltd.), Bargarh
3. Rice mills at Bargarh
4. M/s Bhusan Power & Steel Ltd., Sambalpur
5. M/s Action Ispat & Power (P) Ltd., Jharsuguda
6. M/s Ib Thermal Power Station, OPGC, Jharsuguda
7. Coal mines in Ib Valley Area of M/s Mahanadi Coal Field Limited
8. M/s Vedanta Aluminium Ltd., Jharsuguda

Paradip (February 14-15, 2009)

1. Regional Office of State Pollution Control Board, Orissa at Cuttack
2. M/s Indian Farmers Fertilizer Corporation Ltd., Paradeep
3. M/s Paradeep Phospates Ltd. (Only interviews with two company officers) , Paradeep
4. M/s Paradip Port Trust, Paradeep

List of Persons with Whom Exclusive Interviews Were Held

1. Mr. U. N. Behera, Commissioner-cum-Secretary (Environment & Forests)

2. Mr. R. P. Panda, General Manager, IPICOL, Bhubaneswar

3. Executive Committee Members of the Stone Crushers Associations

5

Questionnaire Survey among the NGOs

VISION DOCUMENT - 2030

FOR

STATE POLLUTION CONTROL BOARD, ORISSA

March 20, 2009

Dear Sir/Madam,

I take great pleasure to inform you that State Pollution Control Board, Bhubaneswar has assigned me the task of developing **Vision Document 2030** for the Board. In this connection I have been going around the industrial units in many regions of the state, talking to the industry personnel, and familiarizing myself with the ground realities. I am aware of the very important role you have been playing to highlight critical environmental issues, raise the awareness of the public and draw the attention of the Board to such issues, and thus make it easy for the Board to achieve its set objective.

I solicit your help in sharing your experience and opinion on the environmental issues in your region, your present and perceived future role in this respect, and on the way the Board should apply itself to address these issues.

In particular, I invite you to participate in a questionnaire survey. The enclosed questionnaire contains ten questions. Please give the answer to each question in the space provided and return the filled-in questionnaire within a week.

I regard your opinion to be a very important input to the preparation of the Vision Document **2030** and I look forward to get your response soon.

Thanking you,

Yours faithfully,

(Pratap K. J. Mohapatra)

Professor
Department of Industrial Engineering & Management
Indian Institute of Technology, Khargpur

1. Address of the NGO:

2. Person filling up the questionnaire

   Name:
   Designation:
   Telephone:
   E-mail:

3. What are the primary environment-related issues in the region where you operate?

   (i)

   (ii)

   (iii)

   (iv)

   (v)

4. To what extent has the State Pollution Control Board been able to address these issues? Support your answer with reasons.

5. What, in your opinion, are the major strengths and weaknesses of the Board?

   Strengths

   (i)

   (ii)

   (iii)

   Weaknesses

   (i)

   (ii)

   (iii)

6. What new environment-related problems could emerge in the next 20 years in the region?

   (i)

(ii)

(iii)

(iv)

(v)

7. In what ways could the Board be strengthened to address them?

(i)

(ii)

(iii)

(iv)

(v)

8. In what ways have you and the general public contributed to overcome the pollution problems in the region?

Your contributions

(i)

(ii)

(iii)

(iv)

(v)

Contribution of the general public

(i)

(ii)

(iii)

(iv)

(v)

9. Can you play a more constructive role in environment management in the region?

10. If answer to the above question is "yes," then please elaborate on the role you can play.

6

Questionnaire on the Goals, Objectives, and Action Plans for the Board

16 March, 2009

Dear Sir/Madam,

Sub: Request for Your Opinion on the Goals, Objectives, and Action Plans for the State Pollution Control Board

Thank you for your cooperation to educate me on the nature of activities, which the State Pollution Control Board, Orissa is currently engaged in. To accomplish the task of preparing a vision document for the Board, I request you to take part in a series of short, quick questionnaire surveys. The surveys will deal with setting long-term goals for the Board, defining short-term objectives for each of the goals set and specifying action plans and planning commensurate resources for achieving the objectives.

In the attached sheet I give the first questionnaire, which contains only one question, I request that your response should reach me as soon as possible (if possible, within a day of receipt of this letter) to enable me to compile the responses and design and administer the second questionnaire.

Thanking you once again.

Professor Pratap K. J. Mohapatra
Department of Industrial Engineering and Management
Indian Institute of Technology Kharagpur
Email: pratap_moha@yahoo.co.in

QUESTIONNAIRE SURVEY
ON
SETTING OF GOALS FOR STATE POLLUTION CONTROL BOARD, ORISSA

Name:

Designation

Location:

What goals should the State Pollution Control Board pursue in the next 20 years? Specify up to five most important goals only.

1. _____

_____

_____

2. _____

_____

_____

3. _____

_____

_____

4. _____

_____

_____

5. _____

_____

_____

Signature

7

Long-Term Goals of State Pollution Control Board, Orissa - A Draft

March 22, 2009

Dear Sir/Madam,

Sub: Long-Term Goals of State Pollution Control Board, Orissa - A Draft

I thank you for giving your opinion on the nature of long-term goals that the Board should set for itself to pursue in the next 20 years. While compiling the responses, I noticed that there were many common points, and quite a few of the responses could logically be categorized as short-term objectives or detailed action plans.

The long-term goals are indicative of high-level aspirations of the Board. They should be focused, precise, and compact. Each goal is therefore a coherent aggregate of number of potential objectives. With these desirable properties of Goals, I took the help of a couple of your colleagues to prepare a set of five goals for the Board. They are as under:

1. Play the statutory *regulatory* role entrusted to the Board to its full potential.
2. Prepare for the challenging areas of environmental concerns.
3. Transform the image of the Board from a regulatory agency to a learning organization with capability to take up *advisory* and *educational* roles in matters of environmental management.
4. Develop adequate physical, manpower, and organizational and management resources to be able to play the above-mentioned roles effectively.
5. Evolve and practise novel service design and delivery mechanisms to facilitate community participation and ensure stakeholder satisfaction.

As you will notice, each goal is highly aggregative, encompassing a number of environmental issues which we can term as "objectives." Based on the responses to various questionnaires administered by me in the past, I have now written, for the sake of illustration, a set of sample objectives in support of each goal.

I request you to go through the goals and the sample of supporting objectives and comment if

a. You agree to

(i) The way the goals are formulated and aggregated
(ii) The statements on goals.

b. In case you do not agree to the way the goals are either formulated or aggregated, please define the goals the way you desire and state them in your own words.

I need your help to reach a consensus on these high-level constructs before we can disaggregate the goals to objectives, and then to action plans and time schedules.

Pratap K. J. Mohapatra

Long-term Goals of the Board

Goal 1: Play the statutory *regulatory* role entrusted to the Board by designing innovative ways of compliance management and enforcement.

This goal reaffirms the primary responsibility of the Board to fulfil the task of prevention, monitoring, control, and abatement of water, air, and land pollution. The Board has to innovate on ways and means to make the task of regulation and control more comfortable and easy and to achieve greater performance efficiency. For example, the Board can

a. Strengthen and empower its regional offices.
b. Design area-based pollution management programs.
c. Develop focused, well-packaged regulatory programmes for SME clusters.

Goal 2: Prepare to address the challenging areas of environmental concerns.

This goal demands that the Board proactively prepares itself to address future environmental challenges. For example, the Board needs to:

a. Develop expertise in areas such as municipal solid waste, pollution generating from non-point sources, electronic wastes, bio-medical wastes, coastal zone management, and global warming.
b. Develop environmental plans for bio-diversity conservation in selected spots such as Chilka, Ansupa, and Similipal.
c. Assess the assimilative capacity of industrial zones of the state.

Goal 3: Transform the image of the Board from a regulatory agency to a learning organization with capability to take up *advisory* and *educational* roles in matters of environmental management.

This goal is a natural outcome of the activities and the innate strengths of the Board. Compliance management associated with the regulatory role is inherently unexciting for the technically strong team of professionals of the Board. The physical and intellectual resources available make it natural for the Board to make consolidated efforts to play the advisory and educational roles in very effective ways. The Board can, for example,

a. Evolve as a major research center in the field of environmental engineering and management with expertise to advise
    i. the industry, in a consultancy mode, to tackle problems of pollution generation and control and
    ii. the government in matters of location of new industrial units.

b. Offer training programmes for industry personnel, government officials, and community members on specific contemporary areas concerning environment.
c. Bring out publications on success stories giving details of how the Board has successfully intervened to influence the pollution-generating units to prevent and control pollution in the environment.

Goal 4: Develop adequate physical, manpower, organizational, and management resources to be able to play the above-mentioned roles effectively.

To effectively play the regulatory, advisory, and educational roles, the Board must build up its capacity in terms of laboratory equipment, skilled manpower, an enabling organizational set up, and a proactive set of management policies. Thus, the Board, for example,

a. Develop a pool of knowledge and expertise in sector-specific issues so as to be able to provide solutions and guidance in environment-related problems and issues for the state.
b. Develop a sophisticated laboratory to facilitate the analysis work.
c. Create an environment of healthy work culture to nurture commitment to work.

Goal 5: Evolve and practise novel service design and delivery mechanisms to facilitate community participation and ensure stakeholder satisfaction.

Pollution generators adversely influence the state of environment and affect the community life. Thus the two most crucial stakeholders for the Board are: (1) the Polluters and (2) the Community. The Board has to carefully design its services and service delivery mechanisms to capture the Voice of the Community (VOC) and to induce the potential polluters to take preemptive steps to overcome a possible threat to environment. The Board, for example, may

a. Design novel mechanisms for inducing the potential polluters to adopt timely measures against pollution generation.
b. Design and use web-based information system to disseminate information on environment, publicize its rules and regulations, best industry practices, and success stories, capture voice of the community, and to display status information.
c. Involve community to monitor environment pollution.

8

Composition of Teams for Exploding Goals into Objectives

March 24, 2009

Dear Sir/Madam,

Sub: Vision Document 2030 - Exploding Goals into Objectives

Thank you for your cooperation in the preparation of the Vision Document. This document, when fully developed, should not be a mere wishful thinking; it should have great practical value and should guide the future plans and activities of the Board. To have a document to fulfill this ultimate aim, it is necessary that everyone of the Board, including you, must participate in its preparation and, thus, own it.

As you know, we have reached consensus to have five broadly defined, long-term goals. It is now necessary that each one of them is exploded into objectives. Objectives must be aligned with the goals, focused, measurable (quantifiable so as to monitor progress towards a target or a benchmark), and be attainable within a specified timeframe.

To achieve this explosion of goals into objectives, we have formed five teams, each team assigned to a specific goal. The suggested team composition is given on the next page. As you will notice, we have included you to be a member of a team.

It is expected that the team leaders will conduct a few rounds of brainstorming on the issue among the team members and will pass on their reports to Dr. B. N. Bhol on or before 28th morning.

We value your cooperation in the preparation of the Vision Document - 2030.

Pratap K. J. Mohapatra

Composition of Teams for Exploding Goals into Objectives

Goal 1: Play the statutory *regulatory* role entrusted to the Board by designing innovative ways of compliance management and enforcement.

Composition of Team 1:

1. Dr. A. K. Swar (Team Leader)
2. Dr. C. P. Das
3. Dr. A. A. K. Chatterjee
4. Er. S. Panda
5. Er. M. Pattanaik
6. Mr. B. P. Pattajoshi

Goal 2: Prepare to address the challenging areas of environmental concerns.

Composition of Team 2:

1. Dr. D. K. Behera (Team Leader)
2. Er. B. K. Behera
3. Mr. S. S. Mishra
4. Dr. L. D. Pal
5. Dr. R. K. Mishra
6. Dr. S. S. Pati

Goal 3: Transform the image of the Board from a regulatory agency to a learning organization with capability to take up *advisory* and *educational* roles in matters of environmental management.

Composition of Team 3:

1. Dr. D. K. Rout (Team Leader)
2. Er. R. N. Prusty
3. Dr. J. R. Dash
4. Er. R. Priyadarshini
5. Mr. H. N. Nayak

Goal 4: Develop adequate physical, manpower, organizational, and management resources to be able to play the above-mentioned roles effectively.

Composition of Team 4:

1. Dr. B. N. Bhol (Team Leader)
2. Mr. M. Majhi
3. Dr. S. K. Mohanty
4. Dr. U. R. Pattanaik
5. Ms. S. Nayak

Goal 5: Evolve and practise novel service design and delivery mechanisms to facilitate community participation and ensure stakeholder satisfaction.

Composition of Team 5:

1. Mr. C. R. Nayak (Team Leader)
2. Er. N. R. Sahoo
3. Dr. M. Dhal
4. Er. R. K. Ekka
5. Ms. K. Tudu

Summary of Responses in the Sensitization Phase (First Questionnaire Survey)

9

Why a Vision Document?

Prepare the Board for the future.
Make a long-term plan.
Determine the Goal before the Board.
Design adequate strategy and policy to achieve the Goal.
Redefine the mandate for the Board.
Identify the gap between the desired state of environment and the achievable action.
Identify new and critical pollution issues that are likely to come up in the future.
Resolve apparent conflicts between developmental and environmental considerations
Enhance institutional efficiency.
Prioritize the thrust areas and activities for the Board.
Build of capacity of the Board to meet future demand.

Who will be the users?

The State Pollution Control Board will be the principal user of the Board.
The document will be placed in public domain and hence the other users of the document are the stakeholders of the Board (i.e., State Government departments, Central Government departments, Central Pollution Control Board, Industries and Industrial Associations, Research Organizations, NGOs, and the general public).

In what ways will the document be used?

The Board can use the document to

Formulate its major strategies to achieve the Goal.
Plan for, and build, its capacity to meet future demand.
Make long-term action plans.
Play a proactive role in environmental management of the state.
Develop a policy framework considering all environmental factors.
Develop specific pollution control guidelines for Orissa-specific sectors (like mining, steel, thermal, and aluminium).

The other stakeholders can use the document in the following ways:

The state government can use the document to address the environment-related concerns while formulating its sector-specific policies.

Industry associations, like FICCI and CII, and industrial organizations can use the document as a reference while making decisions for technology choice.

Central Pollution Control Board can examine the document to judge degree of alignment of the State Board's strategies and policies with those of its own.

Research organizations working on environment-related problems and engaged in futuristic projections can refer to the document to know the Board's long-term policies and action plans.

Being in public domain, the document will be accessible to all; it will enhance public awareness about environmental issues.

What roles does the Board play at the present?

Advises Government on matters related to environment-related policies.

Ensures that environment-related laws and acts are complied by industrial and other pollution-generating units in the State (compliance enforcement).

Designs incentives for the environmentally good industrial units (compliance promotion).

Engages in survey and investigation activities related to pollution abatement.

Acts as a motivator to popularize unconventional use of wastes (such as fly ash).

Makes a comprehensive plan for environmental management.

Enhances public awareness about environmental issues.

Monitors the environment quality of the state (i.e., river quality, ambient air quality, etc.).

Plays a proactive role in identifying new sources of pollution hazards.

Enhances public participation in environment-related decision making.

What strategies does the Board follow at the present?

Decentralization of work.

Use of IT services, although limited in scope.

Standardization of procedures.

Engagement of external experts.

Regulation/enforcement through direction/imposition of performance bank guarantee for effective compliance.

Empowerment of regional offices.

What new roles will the Board play in the next two decades?

The Boards' activities are to be more transparent.

The Board should expend more effort to generate public awareness (including that of school and college students) by conducting seminars and training programmes.

It should be public-friendly to win its trust.

It should generate awareness about future environmental pollution such as biomedical and electronic wastes among the industries and public.

It should develop expertise in new areas such as biomedical and electronic wastes.
It should train industry personnel to make the work of pollution control self-regulatory.

What are the major strengths of the Board?

The mandates for the Board are clear and well understood.
Work procedures are being increasingly standardized and followed.
The Board employees are young (average age of an employee is less than 35 years), qualified and committed.
Compatibility among Board personnel and high integrity of the Board employees has resulted in a conducive work atmosphere.

What are the major weaknesses of the Board?

Manpower strength of the Board is inadequate.
The scientists and engineers are almost engaged full time to carry out regulatory nature of work, leaving virtually no time for preparing new project plans, generating public awareness, and making long-term plan for the future.
No definite programme is made to upgrade employee skill.
Manpower resource is not utilized to its full potential (i.e., not harnessing the basic background of the employees).
Functional division of the organization is weak.
Information dissemination is poor, which hinders winning public trust.
Website of the Board is not updated regularly.
Response time to redress public grievances is high.
Computerized MIS is inadequate.
Documentation of good practices is scanty.
Office space is inadequate.
No interdepartmental coordination exists to maintain emission standards (e.g., highway pollution, market noise)
No dedicated cells exist for research and development and for project planning.
Tardy procurement delays construction and acquisition of new infrastructure and equipment.

Challenges before the Board in the Next Two Decades

To meet higher level of expectation of the public because of its increased level of environmental awareness.
To be able to identify sources of pollution and apportion the pollutants to the specific sources while measuring the air quality in a region.
To relate pollution with health ailment establishment of Health Assessment Cell
To upgrade knowledge of the Board officials and industrial units establishment of Clean Technology Cell

To develop environmental awareness among Judges and sensitize them to the environmental needs, culminating in the establishment of Green Bench in higher courts.

To achieve pollution standards outside the industrial areas (i.e. in urban areas and linear sources of pollution such as road construction)

To improve laboratory facility to be able to analyze samples received from units and public

To enhance capability of the Board and develop specific action plans to address problems of pollution generating from hazardous, biomedical, and electronic wastes, and carbon monoxide and nitrogen oxides in the atmosphere.

To be able to tackle emergent Orissa-specific environment issues such as those related to mineral overburden and coastal discharges.

To play a greater role in the management of municipal solid wastes.

To design a mechanism for greater public-Board partnership to achieve compliances.

To design mechanism for surface water pollution resulting from urban sewage and industrial township.

To develop new zoning atlas for the state for guiding location of new industrial units.

10

Summary of Responses in the Sensitization Phase (Second Questionnaire Survey)

Performance Indicators of the Board

The emission level of pollutants, ambient air quality, water quality, and region-specific biological environmental quality

Number of industrial units coming under the ambit of Board

Performance of pollution control devices and system of the industrial units

Compliance status parameters

- Percentage of compliance achieved by the regulated group
- Average time between identification of violation and enforcement action
- Frequency of inspection and monitoring
- Number of public complaints and assembly and parliament questions
- Time taken to attend to public complaints
- Number of court cases filed by the Board

Number of applications for Consent to Establish and for Consent to Operate in the pipeline

Time to process applications for consent to establish and consent to operate and application for authorization

Number of documents prepared on region-specific environmental issues, preparation of projects, and timely completion of related project action plans.

Percentage coverage of industrial and mining zone for which regional environmental management plan is developed.

Area covered under air pollution monitoring network

Polluted river stretch

Stretch of rivers covered under monitoring programme

Ratio of planned and non-planned expenditure

Ratio of wastewater discharge to total water consumption

Number of non-compliant ambient air quality monitoring stations

Quality performance of Laboratories

Enabling Factors for the Performance of the Board

Vertically short but horizontally broad organizational structure

Healthy work environment

Good infrastructure
Well-qualified and multi-disciplinary scientific and technical manpower
Self-sufficiency in finance
Well-documented procedures and guidelines in most cases
Minimal interference by the Government and other agencies in Board's day-to-day decision-making process

Inhibiting Factors for the Performance of the Board

Inadequate technical manpower and infrastructure leading to adverse effect on efficiency of compliance monitoring activities
The skill composition of employees is not properly balanced.
Absence of structured skill-upgrade programme
Inadequate office and laboratory space
Inadequate experimental facilities in the laboratories for new tests
Inefficient information management within the Board and with the outside world
Lack of official communication channel/mechanism to share the views of lower-level officials with those at the higher level
Monotonous jobs carried out with lengthy procedure and with large amount of documentation de-motivate the employees, forcing them to work below par.
Lack of clarity in job description
Absence of periodic and scientific measurement of employee performance
Absence of a system of performance measurement and award

Strategies Adopted by the Board at the Present for Performance Enhancement

Delegation of power and decentralization of decision-making process to lower level and to regional offices (thereby empower the regional offices to rectify pollution control problems)
Simplification of file processing activities and standardization of procedures
Enforce pollution control laws By coercive means such as closure notices.
Opening new regional offices and strengthening regional offices
Enhanced focus on priority jobs rather than equal focus on all activities
Framing operational guidelines and directions
Introduce the system to give consent to operate for five years
Computerization of data to some extent

New Strategies That the Board Should Follow to Achieve Its New Roles

Further simplify work procedure and broaden the scope of operational guidelines

Strengthen manpower by appointing or engaging more technical persons

Rationalize human resource pool with a balanced skill set

Identify specific skill requirements for each activity

Impart new skills to the existing manpower by regularly sending them to training programmes

Improve communication with increase transparency to build confidence with industrial and other units and the public

Introduce IT-enabled system for surveillance and monitoring of environmental compliance by the industrial and other units

Give more emphasis on time-bound project activities and action plans

Delegate authority to lower level

Set specific achievable target for each individual

Design methods to improve level of motivation of employees

Regularly monitor the performance of employees and take proper steps in the areas requiring strengthening.

Have organizational awards for better performance

Outsource non-core functions (that have no legal obligation) to private consultants/research organizations with expertise in the field of environmental engineering and management

Develop good information management system

Modernize laboratory and monitoring equipment

Develop a framework for public participation to achieve a greater degree of compliance assurance.

Publish environmental status report for major cities of the State

Publish News Bulletins regularly highlighting the activities of the Board

Summary of Responses to the Questionnaire from Regional Officers

Factors Underlying Success

Serial Number	Factors	Regional Offices
1.	Insufficient number of laboratory personnel	Rayagada
2.	Inadequate work space for laboratory	
3.	Non-availability of sampling kits	
4.	Vastness of the region	
5.	Insufficient number of scientists and engineer	
6.	Old vehicle	
7.	Non-standard procedures	
8.	Vacancy in the existing position	
9.	Non-allocation of funds for conducting awareness programmes	
10.	No action specified for recurrence of problems caused by the same unit	Rourkela
11.	No action is possible due to location permission given to old units	
12.	Less number of fly ash brick manufacturing units	
13.	Units in unorganized sectors face problems in implementing pollution control norms	
14.	Difficulty in taking action against government departments such as municipalities	
15.	No mechanism or manpower to take actions regarding wrong methods of hazardous waste disposal	
16.	Inadequate planning	Angul
17.	Relocation cost is enormous	Cuttack
18.	Lack of organizational setup in the Urban Local Bodies on matters concerning environment	
19	Involvement of multiple authorities in the enforcement process.	

Factors Underlying Failure

Serial Number	Factors	Regional Offices
1.	Insufficient number of laboratory personnel	Rayagada
2.	Inadequate work space for laboratory	
3.	Non-availability of sampling kits	
4.	Vastness of the region	
5.	Insufficient number of scientists and engineer	
6.	Old vehicle	
7.	Non-standard procedures	
8.	Vacancy in the existing position	
9.	Non-allocation of funds for conducting awareness programmes	
10.	No action specified for recurrence of problems caused by the same unit	Rourkela
11.	No action is possible due to location permission given to old units	
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14.	Difficulty in taking action against government departments such as municipalities	
15.	No mechanism or manpower to take actions regarding wrong methods of hazardous waste disposal	
16.	Inadequate planning	Angul
17.	Relocation cost is enormous	Cuttack
18.	Lack of organizational setup in the Urban Local Bodies on matters concerning environment	
19.	Involvement of multiple authorities in the enforcement process.	

Anticipated Environment-related Problems

Serial Number	Industrial Activity	Environment-related Problems
1.	Mining	Increased SPM concentration in the ambient air Large overburden Rehabilitation of dumps and mining quarries Contamination of water sources Degradation of land profile Depletion of ground water Air pollution Transport of coal by road with dust emission problem
2.	Alumina Refinery	Management of fly ash Management of red mud pond Water and air quality pollution
3.	Graphite Beneficiation Plants	Contamination of nearly streams
4.	Urbanization	Sewage treatment Municipal solid waste management Air pollution due to vehicular emission Traffic congestion Deterioration of road condition Air and water problem due to domestic sources
5.	Thermal Power Plants	Fly ash problem Depletion of fresh and ground water Emission of increased volume of carbon dioxide
6.	Steel units through DRI Route	Air pollution problem Solid waste management
7.	Aluminium Smelter Plants	Increased fluoride concentration in the surface water, ground water, soil and air
8.	Power Plants	Increased temperature Fly ash problem
9.	Coal washers	Reduction in the level of surface and ground water Water and air pollution
9.	Steel and Sponge Iron Plants	Management of solid waste (such as char, slag, etc.) Inadequate land for disposal of waste Dust pollution due to emissions and fugitive missions
10.	Stone Crushers	Dust Pollution
11.	Industries in Paradip Area	Marine pollution

Ways to Strengthen Regional Offices

1. More number of regional offices for effective monitoring and surveillance
2. More manpower with sound professional skill
3. Train manpower on advanced skills
4. Laboratory facilities should be developed
5. Complete and effective de-centralization of power so that immediate action can be taken against defaulting units.
6. Office should have a more professional look.
7. Funds allocated for transport and travel allowance for touring personnel should be increased.
8. The Board should own land to locate the regional offices and quarters for its staff.
9. Complete automation
10. Communication between Head office and Regional offices should be fast.
11. Deployment of new vehicles
12. Provide software for analysis of monitored data
13. Deploy advanced and handy test gadgets for on-the-spot testing
14. Provide sufficient information on the Web for reply to RTI applicants for non-specific information.
15. River monitoring data should be analyzed statistically; the data and the results of the analysis should be available on the Board's Website for public viewing.
16. Zonal offices may be created with supporting field offices
17. Online monitoring stations may be installed at hot spots to get reliable and fast ambient environmental data
18. Database development and online data transmission facilities should be incorporated to provide better environmental services
19. Carrying capacity studies should be undertaken for every region before allowing establishment of new industrial units.
20. Separate action plans should be prepared and dedicated teams should be deployed for monitoring hazardous materials such as fluoride.
21. The Board should take up with MCL (1) the problem of backfilling of coal mines for disposal/concurrent backfilling of coal mines with fly ash, char, and tailings to avoid degradation of land due to dumping solid waste management and (2) the idea of transporting coal by rail or by road dedicated to coal transport.

Summary of Feedback Received and Observations Made during Visits to Industrial Units

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Feedback Received

1. The Board is doing commendable job, given the limitation of the facilities and human resource available with it.
2. The units attempt to execute all the directions of the Board in respect of pollution control. However, often, the time to execute them tends to be high.
3. Low-quality coal supplied by MCL is the main reason for pollution at some of the units. According to Action Ispat & Power (P) Ltd., MCL may refine coal further and charge a higher price to the unit.
4. Partnership with a foreign firm in respect of Orissa Power Generation Corporation Limited has helped the unit to realize the importance of pollution prevention and control and has made them one of the most environment-friendly units in the state.
5. Large corporations (such as Vedanta Aluminium Ltd. and M/S Bargarh Cement Works (ACC Ltd.), Bargarh are able to invest in pollution abatement equipment, whereas the small units (e.g., rice mills) are using only primitive methods.
6. Quite often the units as well as the Board lack competency to solve specific pollution-related problems.
7. There have been cases of long delay (about 9 months) in getting "Consent to Operate".
8. Payment has been made for five years for "Consent to Operate", yet the unit is being asked to make annual payment.
9. Board is understaffed; the support staff and infrastructure is inadequate; and the frequency of change of regional officers is quite high.
10. The Board should try to pursue global standards. No data/information are available on such standards or on control measures to such standards.
11. Participatory, supportive regime should replace inspection regime.
12. Plant-plant, industry-industry coordination is required to solve common problems. The regional officers should facilitate such coordination.
13. The Board should develop world-class laboratories.
14. The Board should document the best practices of the industries.
15. Prevention of pollution, rather than control, should be the focus of the Board.
16. The Board should try to bring about a synergy among the units by utilizing the wastes generated in one plant as raw materials in another.

Observations Made

1. Regional officers are young, active, and well-informed, but are overworked due to heavy load but with very inadequate staff strength.
2. Laboratories in the regional offices and are not equipped with the state-of-the-art instruments and are not well maintained.
3. The regional officers are overwhelmed with the problem of having to cover a wide geographical region, collecting samples, and reporting test results, etc., hardly leaving any time to address emerging issues in the region.
4. The officers have little time to upgrade their skills to solve new pollution-related problems or problems that are common to many plants.
5. The House Committee meetings often take up public complaints without verifying whether or not they are genuine.
6. Such meetings, however, keep the Board officials on their toes. Such a Committee should therefore continue to function; however, its composition and authority may be redefined. It could be headed, for example, by a non-political person.
7. The regional offices should be equipped with adequate laboratory, computer and communication facilities, trained manpower, and with enough office space to be proud of.
8. The Board should document its success stories and achievements and give them wide publicity.
9. At the present, the regional offices are engaged primarily in activities oriented to collecting samples, testing them, communicating the test results to the Head Office, issuing notices, and monitoring the execution work. The Board can engage itself, in addition, in other proactive ways. Two proactive actions are mentioned below.

    (i) Analyzing the test data, making futuristic projections, and recommending preventive actions against likely generation of pollutants.

    (ii) Engaging officials of industrial units in dialogue to list common problems, benchmark for the best practices, and offer solutions.

10. Rapid industrialization has given rise to new and complex pollution problems. The Board, with its current human and infrastructure capability, is not in a position to solve these problems. It is important for the Board to engage in capacity-building exercise.

11. It is important to have "public consultation" at the project stage rather than have "public hearing" at the production stage.
12. NGOs, representing the public, may have their own interests, not those of the communities.
13. Air quality kits provided to local students and NGOs, called citizen monitoring, can help the process.
14. Community-environment partnership (between the Board and the community) should be developed to prepare Toxic Release Inventory Report and prepare city-level action plans.
15. Industry should voluntarily divulge information on effluents under the RTI Act, 2005.
16. Information (related to environment) should be disseminated through kiosks.
17. Skills and techniques required for public hearing include: listening and communication, community outreach and partnering, issue identification and management, consensus building, vision building, negotiation and alternative dispute resolution.
18. Companies should have company engagement manuals, used in-house, to provide clear direction for public consultation.
19. Devolution of environment responsibilities to local bodies (decentralization) is helpful.
20. The Board has turned its attention on large- and medium-scale units and achieved success, but have not done much for the small-scale sector, municipal systems, construction sector and coastal pollution.