

**HIGHLIGHTS
OF
SCIENTIFIC & TECHNICAL
ACTIVITIES
OF
CENTRAL POLLUTION CONTROL BOARD**



CENTRAL POLLUTION CONTROL BOARD

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March,2003

MAJOR ENVIRONMENTAL ACTS

- **The Water (Prevention & Control of Pollution) Act, 1974**
- **The Water (Prevention & Control of Pollution) Cess, Act, 1974 as amended in 1991.**
- **The Air (Prevention & Control of Pollution) Act, 1981**
- **The Environment (Protection) Act, 1986**
- **The Public Liability Insurance Act, 1991**
- **The National Environmental Tribunal Act, 1995**
- **The National Environment Appellate Authority Act, 1997**



CENTRAL POLLUTION CONTROL BOARD

- **The Central Pollution Control Board (CPCB) has been constituted in September, 1974 under the provisions of the Water (Prevention & Control of Pollution) Act, 1974**

BOARD MEMBERS OF CPCB

❑	Full Time Chairman	1
❑	Representative from Govt.	5
❑	Members of State Boards which includes not > 2 from local authorities	5
❑	Non- Officials (agriculture, Fishery, industry, Trade etc.)	3
❑	Members from Companies/ corporations	2
❑	Full Time Member Secretary	1
	TOTAL	17

Functions of the Central Board (At national level)

- **Advise the Central Government on any matter concerning prevention and control of water and air pollution;**
- **Plan and execute nation-wide Pollution Control programmes;**
- **Co-ordinate the activities of State Boards and Pollution Control Committees;**
- **Provide technical assistance and guidance to the State Boards**
- **Carryout an sponsor investigation and research related to pollution control;;**
- **Plan and organise training programmes;**
- **Organise mass awareness programmes;**
- **Collect, compile and publish technical and statistical data relating to water and air pollution;**
- **Prepare manuals, codes and guidelines relating to treatment and disposal of wastes;**
- **Disseminate information in respect of matters relating to water and air pollution;**
- **Lay down, modify or annul waster and air quality standards; and**
- **Perform such other functions as and when prescribed by the Government of India.**

NEW RESPONSIBILITIES GIVEN BY MoEF

- Environmental Protection Control Authority (EPCA)
- Loss of Ecology Work
- Taj Trapezium Authority
- Bio Medical Rules – Implementation
- Noise Pollution Control – Standard development
- Vehicular Pollution Control – Standard development
- Fuel quality standard
- Hazardous waste management (Technical issues)
- Municipal solid waste management
- Plastic waste management
- Fly ash rules

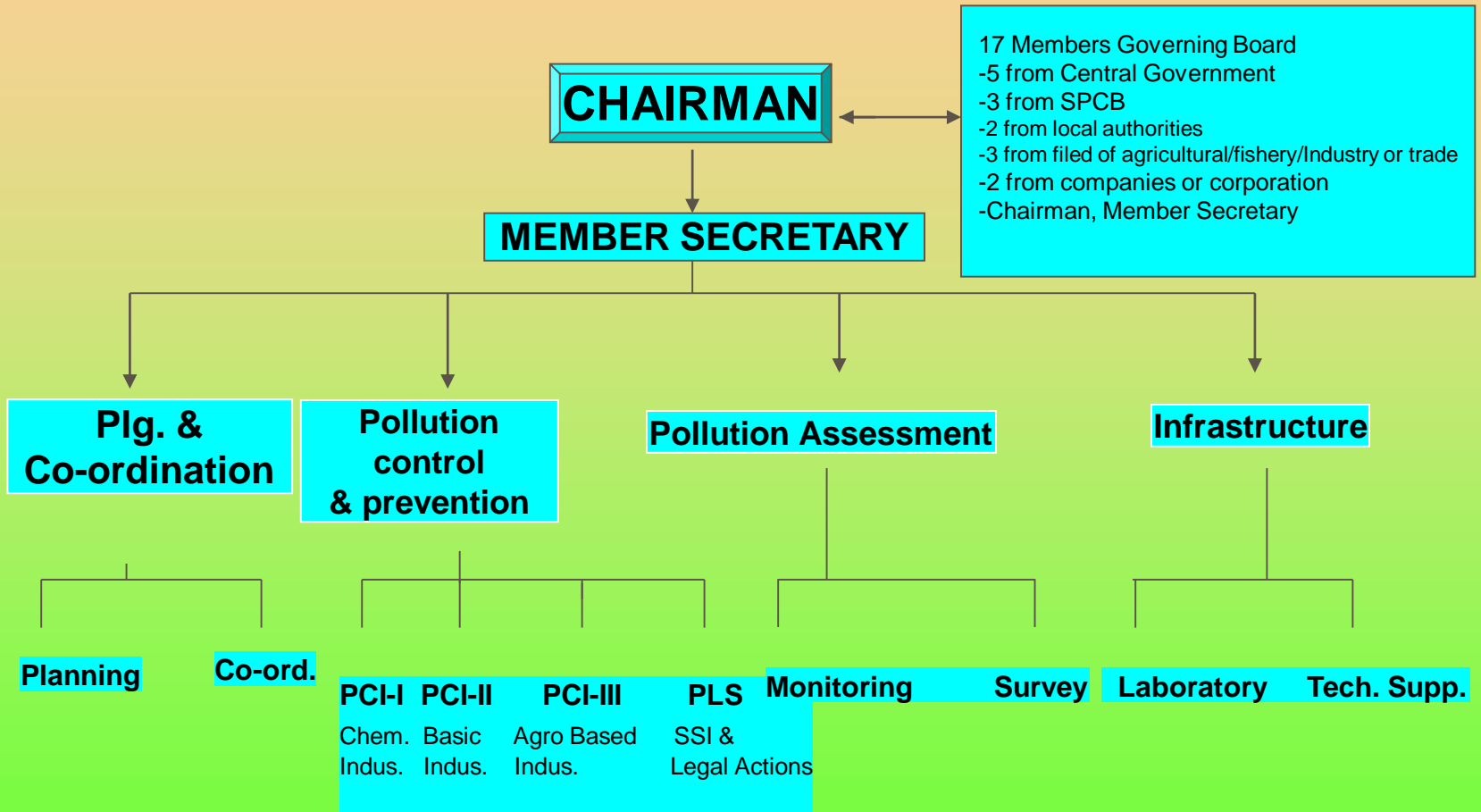
PLAN PROPOSALS- 2002-2003

PROJECT HEAD

Outlays (Rs. in Lakhs)

I	Pollution Assessment- Survey & Monitoring	556.50
II	Laboratory Management (Operation & Maintenance and R & D)	318.00
III	Development of Standards & Guidelines	106.34
IV	Training	16.10
VA	Information (Data Base) Management	34.80
VB	Library	26.60
VI	Pollution Control Enforcement	911.11
VII	Pollution Prevention & Control Technology	86.90
VIII	Mass awareness, Publication and NGO activities	58.25
IX	Hazardous Waste Management	35.40
	Total	2,200.00

ORGANISATION STRUCTURE



**CENTRAL POLLUTION CONTROL BOARD (CPCB)
HEAD OFFICE, DELHI**

Zonal Offices of CPCB with Jurisdiction

KANPUR

KOLKATA

SHILONG

BHOPAL

VADODARA

BANGLORE

Uttar Pradesh
Uttaranchal
Jammu &
Kashmir,
Himachal
Pradesh,
Punjab,
Haryana
UT Delhi

Bihar
Jharkhand
Orissa
Sikkim
West Bengal
UT Andaman
Nicobar

Assam
Manipur
Meghalaya
Mizoram
Nagaland
Tripura

Madhya
Pradesh
Rajasthan
Chattisgarh

Gujrat
Maharashtra
UT Daman,
& Nagar
Haveli

Andhra Pradesh
Goa
Karnataka
Kerala
Tamilnadu
UT Lakshadweep
UT Pondichary

Planning and Co-ordination

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graph TD; A[Planning and Co-ordination] --> B[Planning]; A --> C[Co-ordination]; B --> B1[- Perspective planning]; B --> B2[- Project planning]; B --> B3[- Manpower planning]; B --> B4[- Performance audit]; B --> B5[- Human Resource Development]; B --> B6[- Eco-Mark]; C --> C1[- State Board activities]; C --> C2[- Board meetings & conferences of CPCB & SPCBs]; C --> C3[- Interaction with ministry & govt. Dept.]; C --> C4[- Parliament question];
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Planning

- Perspective planning
- Project planning
- Manpower planning
- Performance audit
- Human Resource Development
- Eco-Mark

Co-ordination

- State Board activities
- Board meetings & conferences of CPCB & SPCBs
- Interaction with ministry & govt. Dept.
- Parliament question

Pollution Assessment

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graph TD; A[Pollution Assessment] --> B[Monitoring]; A --> C[Survey]; B --> D["Monitoring of Ambient quality<br/>- Inland waters<br/>- Air & noise<br/>- Coastal water<br/>Industrial emission & effluents<br/>Data interpretation & quality assurance<br/>Critically polluted river stretches"]; C --> E["Inventory of pollution sources<br/>- industries<br/>- municipalities<br/>- critically polluted areas<br/>- vehicular<br/>River basin study<br/>Industrial estate"];
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Monitoring

Monitoring of Ambient quality

- Inland waters
- Air & noise
- Coastal water

Industrial emission & effluents

Data interpretation & quality assurance

Critically polluted river stretches

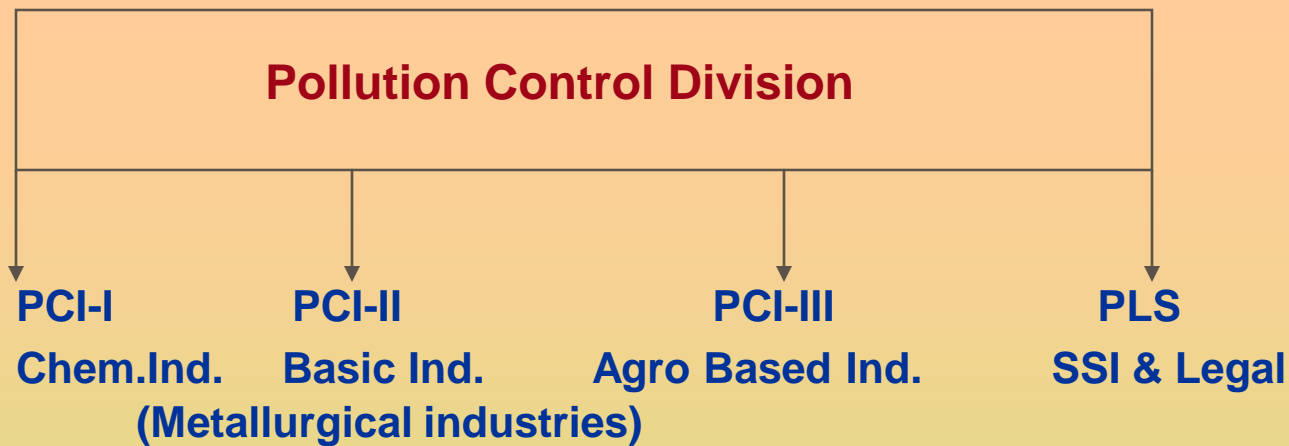
Survey

Inventory of pollution sources

- industries
- municipalities
- critically polluted areas
- vehicular

River basin study

Industrial estate



- Setting/updating standards
- Participation in BIS committees
- EAC/EIA review
- Legal action
- Actions under EPA
- Emergency measures
- Cess
- Transfer of technology
- Pollution control in 17 major categories of polluting industries
- Environmental auditing
- Implementation of action plan for problem areas
- Industrial pollution control under Ganga Action Plan
- Public complaints
- Zoning atlas – Sifting of Industries
- Noise Pollution Control
- Vehicular Pollution Control
- Fuel quality standard
- Biomedical Waste
- Hazardous Waste Management

Infrastructure Division

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graph TD; A[Infrastructure Division] --> B[Laboratory]; A --> C[Tech. Supp.]; B --> D["- Laboratory management<br>- Monitoring activities<br>- Laboratory analysis<br>- R & D Activities<br>- Quality assurance/control system<br>- Strengthening of laboratories<br>- Scientific services to SPCBs, MoEF, etc."]; C --> E["- Information services<br>- Data processing<br>- Library<br>- Drawing & draughting<br>- Public relation<br>- Media & mass awareness<br>- Publications<br>- NGOs<br>- Training"]
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Laboratory

- Laboratory management
- Monitoring activities
- Laboratory analysis
- R & D Activities
- Quality assurance/control system
- Strengthening of laboratories
- Scientific services to SPCBs, MoEF, etc.

Tech. Supp.

- Information services
- Data processing
- Library
- Drawing & draughting
- Public relation
- Media & mass awareness
- Publications
- NGOs
- Training

Work done in the field of Water Pollution Control

Developed a scheme for classification and zoning of water resources based on “ designated best use” concept to set targets for water pollution control.

Carried out river basin studies for all the 14 major rivers for assessment of pollution potential in the river basin. Such study for the Ganga basin formed the basis of Ganga action plan.

Developed water quality monitoring network of 783 stations (monitored/quarterly for 23 parameters).

Identified 85 polluted river stretches and prepared action plan for restoration of water quality. This has helped in formulation in National River Action Plan.

Developed Minimum National Standards (MINAS) for more than 70 categories of polluting industries based on techno – economic feasibility.

Inventorised class – I and II cities for water supply, wastewater generation, collection, treatment and disposal for setting priorities for sewage treatment in urban areas.

**Identified and formulated action plans for 24 problem areas (hot spots).
Implementation is in progress.**

Prepared a Nationwide inventory of large, medium & cluster of small scale industries (presently updating).

Identified 17 categories of highly polluted industries (1551 Nos.) for tackling pollution problems on priority.

Identified industries discharging their effluents into rivers & lakes to protect the water bodies.

Waste minimization through adoption of cleaner technologies and cleaner production.

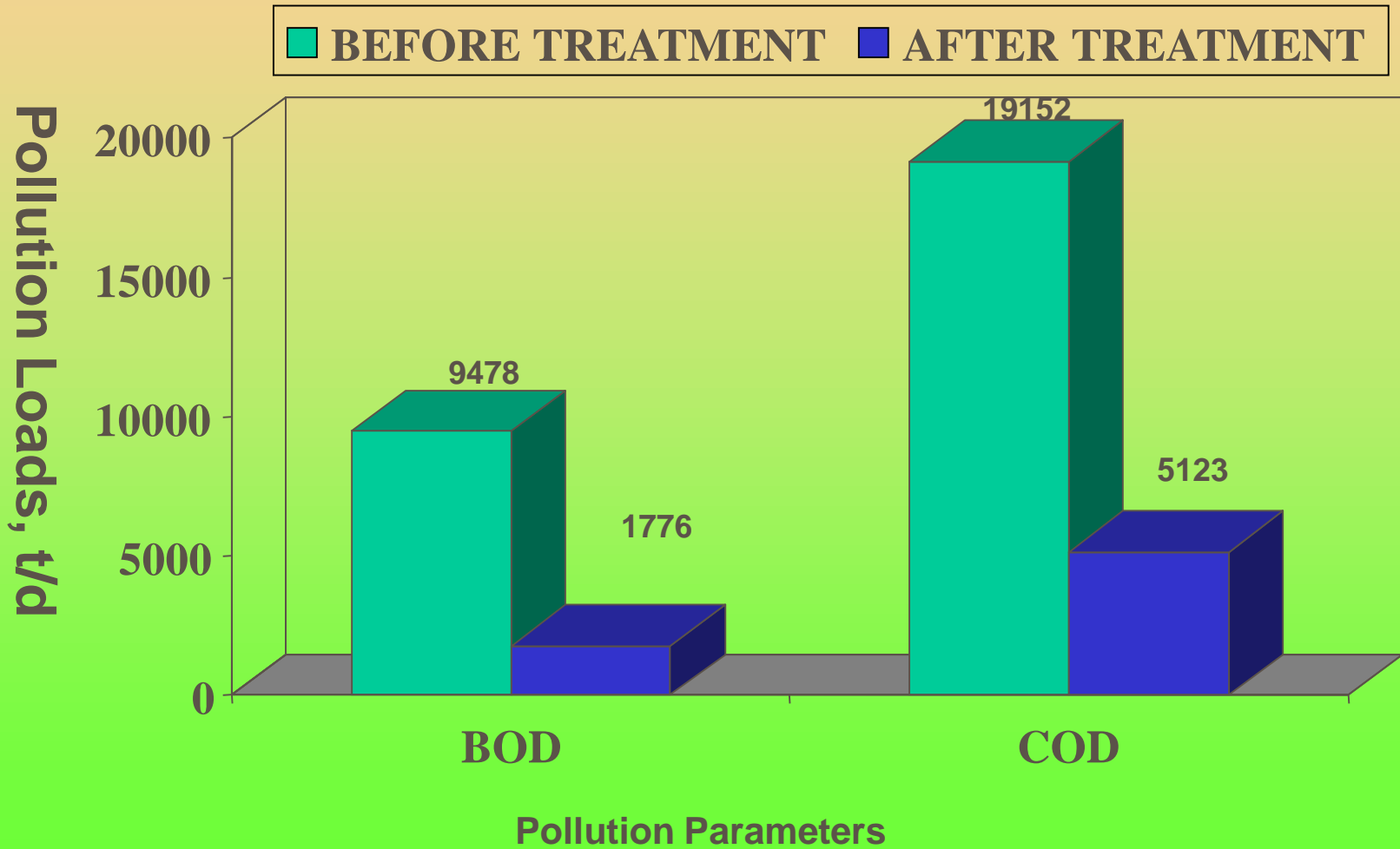
Scheme for preparation of environmental maps for siting of industries (upto district level).

Rebate / exemption in excise & custom duties for pollution control /monitoring instruments / equipment / devices.

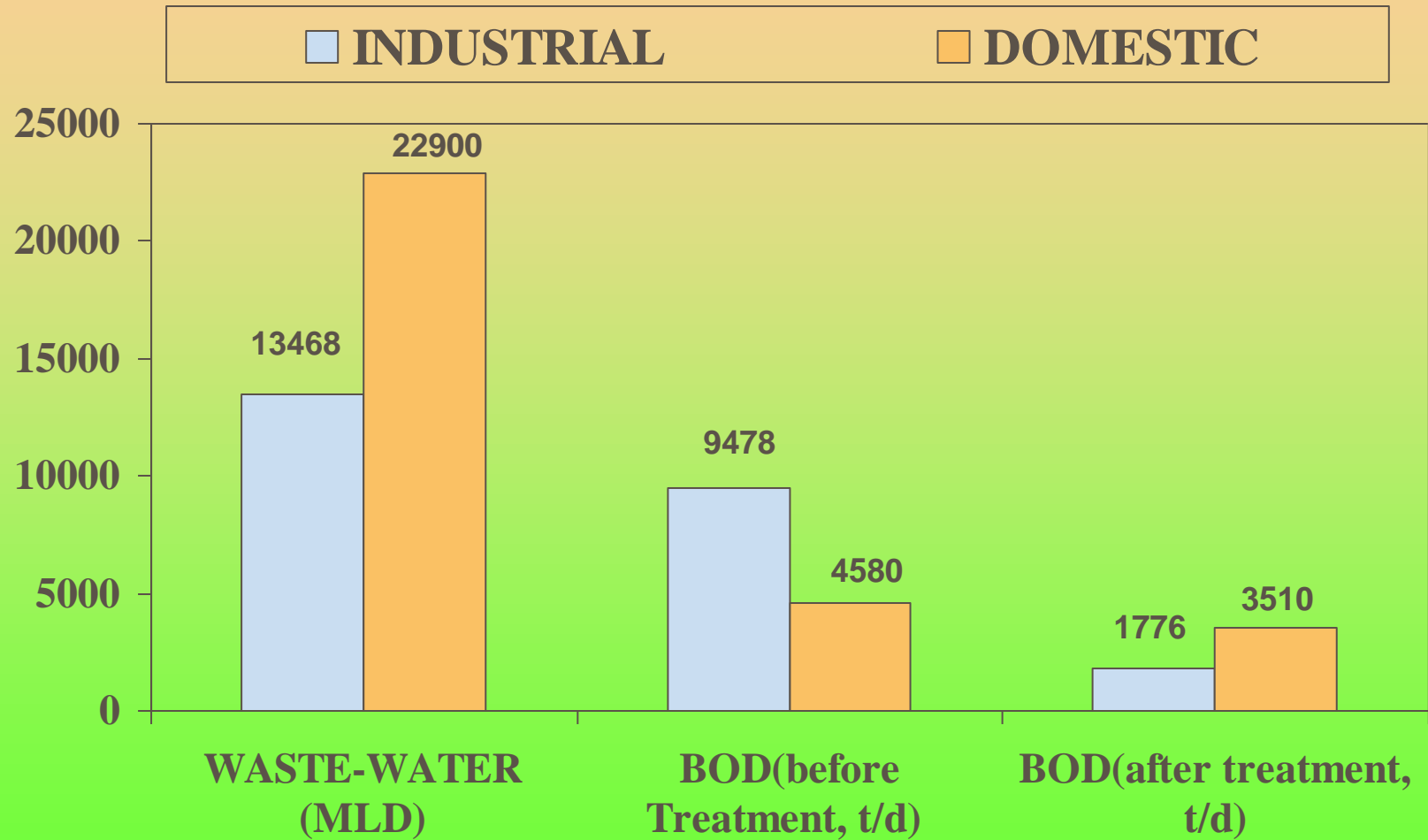
Setting up of common effluent treatment plants (CETP) for small scale / cluster of industries.

Financial assistance through foreign institutions (soft loan & aid) to the pollution control boards for capacity building and industries for ETP/CETP.

OUTCOME OF INDUSTRIAL POLLUTION CONTROL IN TERMS OF REDUCTION OF POLLUTION LOADS



COMPARISON OF INDUSTRIAL & DOMESTIC POLLUTION LOAD



WATER QUALITY MONITORING NETWORK

OBJECTIVES :

1. To know the existing river quality.
2. To compare it with the classified best designed use quality of the river.
3. To take effective measures to maintain or restore the wholesomeness of the water bodies.

MONITORING NETWORK

Total number of Monitoring stations as on March,2001 : 507 stations covering all rivers (total rivers in India Major 14, medium 44 & small 55).

MONITORING AGENCIES : 21 state Pollution Control Boards + 5 UT's + Zonal offices of Central Board

Parameters : 23 Parameters

Frequency : Once in a month/quarterly

Budget : Approx. Rupees 1 crore per year for 507 monitoring stations

AMBIENT AIR QUALITY MONITORING PROGRAMME

Number of stations	:	295
Coverage	:	24 states and 4 Uts covering 92 cities/towns
Locations	:	Residential, Rural, Industrial and Sensitive areas
Modus operandi	:	

- * Monitoring conducted by Central/State Pollution Control Boards & NEERI.**
- * Data transmitted to CPCB for publication of Annual Air Quality Statistics and Status reports.**

AMBIENT AIR QUALITY MONITORING PROGRAMME

Parameter monitored:

Sulphur dioxide (4-hrly for 24 hours)

Oxides of Nitrogen (4-hrly for 24 hours)

Suspended Particulate Matter (8hrly for 24 hours)

On bi-weekly basis at all monitoring stations.

Additional Parameters monitored at some locations:

Carbon Monoxide

Ozone

RSPM (Respirable Suspended Particulate Matter)

Polynuclear Aromatic Hydrocarbon (PAH)

Lead and other toxic metals

Benzene

Environmental Standards

- **Ambient Air Quality Standards**
- **Water Quality Standards (surface, water bodies and coastal)**
- **Industrial waste water and Emission standards**
- **Ambient and Source-wise Noise standards**
- **Vehicular emission standards (mass emission & in-use vehicles)**
- **Fuel quality specifications (solid and liquid)**

Standards are set based on Techno-Economic feasibility and health effects

STANDARDS FOR LIQUID EFFLUENTS, GASEOUS EMISSIONS, AUTOMOBILE EXHAUST, NOISE & AMBIENT AIR QUALITY

SL	Category of Industry/ Unit Operation
1	Aluminum
2	Ambient Air Quality (National) (1982,1994)
3	Asbestos Products
4	Bagasse Fired Boilers
5	Battery Manufacturing Industry
6	Beehive Hard Coke Oven
7	Boiler (Small)
8	Brick Klins
9	Briquette Industry (Coal)
10	Bullion Refining
11	Calcium Carbide Plant
12	Carbon Black Industry
13	Cement Industry
14	Ceramic Industry
15	Chlor-alkali (Caustic Soda)
16	Coke Ovens
17	Copper, Lead & Zinc smelting units
18	Pollution prevention & control in Coal Mines
19	Coal Washeries

SL	Category
20	Dairy Industry
21	Cupola Furnace
22	Diesel Generator Sets
23	Diesel Fuel
24	Diesel vehicles
25	Dye & Dye Intermediate Industry
26	Edible Oil & Vanaspati Industry
27	Electroplating Industry
28	Fermentation Industry (Distilleries)
29	Fertilizer Industry
30	Flour Mills
31	Food & fruit Processing Industry
32	Foundries
33	General Standards for discharge of Environmental pollution
34	Glass Industry
35	Hospital Wastes
36	Integrated iron& steel Plant
37	Inorganic Chemical Industry
38	Jute Processing industry
39	Lime Kilns
40	Large Pulp & paper Industry

41	Leather Industry
42	Man-made Fiber Industry
43	Motor Gasoline Specifications
44	Natural Rubber processing Industry
45	Nitric Acid Plant
46	Ambient Noise standards
47	Oil Refinery
48	Oil Drilling & Gas extraction Industry
49	Organic Chemicals manufacturing Industry
50	Paint Industry
51	Pesticide Industry
52	Pharmaceutical Industry
53	Petrochemicals
53	Petrol Driven vehicles
55	Slaughter House
56	Small Pulp & paper Industry
57	Small Scale Industry
58	Stone crushing Unit
59	Sugar Industry
60	Sulphuric acid Plant
61	Synthetic Rubber
62	Soda Ash Industry

SL	Category
63	Starch Industry
64	Soft Coke Industry
65	Tannery
66	Thermal Power plant
67	Gas/Naptha Based Power Plants
68	Explosive Industry
69	DG Set (15-1500 KVA)
70	Coal Mining Industry

COLLABORATIVE PROJECTS WITH VARIOUS ORGANIZATIONS / INSTITUTIONS

S.No	Name of Organization / institution	No. of Projects
01.	World Bank	04
02.	GTZ, Indo-German Project	08
03.	UNEP	01
04.	UNICEF	01
05.	NEERI, NAGPUR	11
06.	IITs	04
07.	Dept. of Ocean Development	01
08.	EPTRI, Hyderabad	08
09.	Anna University, Chennai	01
10.	PCRI, Hardwar	02
11.	Sulabh International, Delhi	01
12.	Jadavpur University, Calcutta	01
13.	Indian Agricultural Research Institute, Delhi	01
14.	National Physical Lab., Delhi	04
15.	CBT, CSIR, Delhi	04
16.	National Remote Sensing Agency, Hyderabad	01
17.	National Atlas & Thematic Mapping Organisation, Calcutta	02
18.	West Bengal State Council of Science & Technology, Calcutta	03
19.	National Chemical Lab., Pune	05
20.	CLRI, Chennai	02
	Total Projects	65

Environmental Awareness and Public Participation

An NGO cell is set up in CPCB to coordinate the following tasks :

- enlist environmental NGO's involved in pollution control
- establish NGO network in consultation with SPCB/ZO
- Provide training to NGO's and equip them with facilities like WTK, literature, etc
- Organise mass awareness programmes through NGO's

Total 625 NGO's enlisted till March 2000. Rebate of 50% given to NGO's on purchase of CPCB Publications and WTK's.

Development of Water Testing Kits (WTK)

- Environmental awareness play a vital role in prevention and control of pollution in industrial as well as community levels.

The main objectives of WTK is to create mass awareness and to provide low-cost Water testing facility.

- WTK is a portable mini laboratory developed by CPCB for conducting analysis of water for 21 tests.
- The kit is specially developed for students, NGO's and non-technical people.
- Smaller kit developed for fluoride testing (for UNICEF) in rural areas



WATER TESTING KIT

Developed by CPCB in 1995

SOME IMPORTANT R & D PROJECT STUDIES

(completed / ongoing)

- 1. BOD test determination at 27° c for 3 days for tropical countries like India as against standard condition of 20 ° c for 5 days (Accepted as BIS standard method).**
- 2. BODSEED, a microbial mixture, an alternative to conventional sewage seed in BOD determination (available commercially).**
- 3. BOD BEADS – Improved and reusable version of BODSEED (Patented).**
- 4. Testing and validation of immobilised microbial membrane for development of BOD biosensor for rapid BOD determination (MoEF sponsored project).**

R & D PROJECT STUDIES(Contd.)

- 5. Technological development of specific microbial packages for treatment of paper and pulp industrial wastewaters (sponsored by DBT).**
- 6. Studies on Correlation of COD, BOD and TOC for industrial and domestic wastewater [to replace COD (4hrs test) and BOD (3days test) by TOC (few minutes)].**
- 7. Analytical Quality Control (AQC/water) for the laboratories of SPCB, NRCD project laboratories EPA Recognised Laboratories, Hydrology Project Laboratories etc. (20 parameters, around 150 labs in 2000)**

R & D PROJECT STUDIES(Contd.)

- 8. Development and implementation of Biomonitoring techniques for assessment of water quality of river and lakes (simple and inexpensive technique useful to NGOs, schools, colleges and non-technical people).**
- 9. Developed and distributed around 600 Water Testing Kits (WTK) to NGOs, schools, colleges, Panchyats, Nagar palikas and other organisations (20 parameters can be analysed, cost Rs. 2000/-).**
- 10. Development of Fluoride Testing kit (FTK) for UNICEF.**

R & D PROJECT STUDIES(Contd.)

- 11. Development and testing of Sludge Reagent Product (SRP), an Innovative Process for Water and Waste Water Treatment (patent filed)- [Saving of Alum consumption in Waterworks about 90 %, continuous reuse of sludge, reduced sludge production and dumping of aluminium in the environment about 85 to 90%].**
- 12. Development of analytical methodology and standards in terms of dimensionless toxicity factor (TF) for industrial effluents. (Studies conducted on pesticide, Pharmaceutical, tanneries, textile and dye & dye intermediate effluents.**

CENTRAL POLLUTION CONTROL BOARD

List of sponsored ongoing Scientific/R & D project studies

1. **Monitoring of Yamuna River for Assessment of Water Quality (Sponsored by NRCD, MoEF).**
2. **Performance studies of Sewage Treatment Plants (STP) in Delhi, Faridabad, Gurgaon and Ballabgarh constructed under Yamuna Action Plan (Sponsored by NRCD, MoEF).**
3. **Performance of STPs along the Ganga River (Sponsored by NRCD, MoEF).**
4. **Analytical Quality Control (AQC/water) for the laboratories of Hydrology Project, an Indo-Nether project (Sponsored by Hydrology Project).**
5. **Development of Certified Reference Materials (CRMS) of toxic metals in industrial effluent (sponsored by DST).**
6. **National task for Development of Reference Materials- Co-ordination activities- (sponsored by DST).**

Ongoing Scientific/R & D project studies

(Contd.)

7. Development of Fluoride Testing Kit for UNICEF (Sponsored By UNICEF).
8. Development of Certified Reference Materials (CRMS) of gas mixtures for the first time in the country (sponsored by DST).
9. Performance Evaluation of 9 Sewage Treatment Plants (STP) located in Delhi (sponsored by Delhi Jal Board).
10. Performance Evaluation of Sewage Treatment Plants (STP) located in Noida & Mathura (sponsored by U.P. Jal Nigam).
11. Technological development of specific microbial packages for treatment of paper and pulp industrial wastewaters (sponsored by DBT).

CENTRAL POLLUTION CONTROL BOARD PATENTS OBTAINED

*(Jointly with Centre for Biochemical Technology, CSIR,
Delhi)*

- 1. BODSEED Patent: "A process for the preparation of a microbial composition useful for reproducible BOD estimation"
Patent No.: 343/DEL/94. Accepted for Publication in 1998**

The BODSEED has been patented during 1998 in the above title and transfer of technology has been made through BCIL, N.Delhi to M/S Indo Bioactive labs (P) Ltd., Pune

- 2. A Reusable immobilized Microbial Composition useful as Ready-to-Use Seed Inoculum in BOD Analysis Granted in USA Patent No. 5952,188, 1999**

- 3. A process for the Neutralization of Alkaline wastewater by using package of Alkalophilic Bacteria
Patent No. 1518/DEL/94, 1994 Accepted for publication in 1998**

- 4. An Immobilized Microbial Consortium useful for Rapid and Reliable BOD**

PATENTS APPLIED

(Jointly with Centre for Biochemical technology, CSIR, Delhi)

1. **A Reusable immobilized Microbial Composition useful as Ready-to-Use Seed Inoculum in BOD Analysis**
Filed in UK, Patent No. 9813305.1, June, 1998
2. **A Microbial Composition and a Process useful for the Neutralization of alkaline Waste-Waters.**
Filed in USA, Patent No. 09/160422, 1998
3. **A Microbial Composition and a Process useful for the Neutralization of alkaline Waste-Waters.**
Filed in UK, Patent No. 9823332.3, 1998
4. **An Immobilized Microbial Consortium useful for Rapid and Reliable BOD estimation**
Filed in UK, 2000
5. **Process for the preparation of an immobilized Microbial Consortium Useful for Rapid and Reliable BOD Estimation.**
Patent filed in India, 2000, NF/119/2000
6. **Treatment of Water With SRP Technology**
Patent filed in India, 2001

Dissemination of Data/information

<http://www.envfor.nic.in/cpcb>

CPCB Publications

1. Comprehensive industry document series (COINDS)
2. Programme objective series (PROBES)
3. Assessment and development study of river basins series (ADSORBS)
4. Coastal pollution series (COPOCS)
5. Laboratory analytical techniques series (LATS)
6. Monitoring of Indian national aquatic resources series (MINARS)
7. National ambient air quality monitoring series (NAAQMS)
8. Ecological impact assessment series (EIAS)
9. Pollution control legislation series (PCLS)
10. Hazardous waste management series (HAZWAMS)
11. Resources recycling series (RERES)
12. Ground water quality series (GWQS)
13. Information manual on pollution abatement and cleaner technologies (IMPACTS)
14. Environmental mapping and planning series (EMAPS)

CENTRAL POLLUTION CONTROL BOARD

Scientific & Technical ACTIVITIES

SYNOPSIS

S.No.	Title	Nos.
01.	Total No. of laboratory Scientific projects carried out in last 5 years	51
02.	No. Of ongoing sponsored projects	09
03.	No. of patents obtained	03
04.	No. of patents applied	06
05.	Industry specific standards developed	70
06.	No. of collaborative projects with various organizations/institutions	65
07.	No. of Research papers published by CPCB officials	697
08.	Total No. of technical publications made by CPCB	319
09.	No. of scientific and technical training imparted by CPCB	220
10.	No. of technologies developed/evaluated/disseminated for pollution prevention and control	23
11.	No. of Environmental planning studies / mapping conducted in last 5 years	90
12.	No. of books available in library	7560
13.	No. of Journal subscribed / received	50

Activities Proposed for 2003-2004

- Continuation of water and air quality monitoring & trend analysis
- Survey of polluted river stretches & preparation of action plan
- Preparation of environmental status reports
- Inventorisation of industries, vehicles & other sources
- Analytical Quality Control
- Analysis of critical pollutants (PM₁₀, PM_{2.5}, BTX, VOC, Metals, etc.)
- Bio-monitoring of rivers and lakes
- Continuation of ambient air quality monitoring in Delhi
- Development of Standard & guidelines (Industry specific)
- Pollution control in 17 categories of highly polluting industries
- Pollution control in grossly polluting industries discharging wastewater into rivers and lakes. Pollution control in Urban areas.
- Implementation of action plans in 24 problem areas & Major cities
- Zoning atlas for siting of industries
- Management of municipal waste (sewage & solid)
- Management of Bio-medical waste & setting up common facility for bio-medical waste
- Vehicular and noise pollution control
- Inventorisation of Hazardous industries and setting up of treatment and disposal facilities. TSDF facilities for Hazardous Waste Management.
- Mass awareness programmes including distribution of Water Testing Kit and Interaction with NGOs
- Fly Ash utilisation
- Linkages with SPCB/PCCs through computer networking.
- Training programmes for SPCBs and industries

- * **Environmental Health Studies in Critically Polluted Areas**
- * **Standardization of all Bio Medical Waste Treatment Process (Autoclave, Hydroclave, Incinerator,....) (Responsibility given by Hon'ble Supreme Court)**
- * **Increase the number of Water Quality Monitoring Stations from 503 to 1000 by 2005**
- * **Technology Development for Pollution Prevention and Control for all Small and Medium Scale Polluting Industries**
- **Analytical Quality Control and Quality Assurance of all Air and Water Quality Data**
- **Inventorization of hazardous waste generation & development of common treatment, collection & disposal facilities**
- * **Setting of Calibration Laboratories in all CPCB Zonal Laboratories and SPCB Laboratories**
- **Development of Indigenous Continuous Air Quality Monitoring Equipment**
- * **Setting up of calibration centers for air quality monitoring instruments**
- * **Development of Fuel Quality Standard for 2010 based on Scientific Studies**
- **Development of Emission Standard for Vehicles for 2010 based on Scientific studies**
- **Setting of model common waste treatment facility for management of Bio Medical Waste**
- **Setting of model Municipal Solid Waste Treatment plant**

Thank You