

Parivesh

A News Letter from ENVIS Centre - Central Pollution Control Board

Editorial

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Editorial

We are happy to enter into the third year of publications of the **Parivesh**, Through the Parivesh, we have tried to share information on various aspects of pollution and strengthen our linkage with all concerned for the cause of environmental protection.

In the previous issue of Parivesh, we have covered the following themes : ozone depletion; Agro-based industry; River basins; Air pollution and its control; Bio-monitoring of water; Groundwater quality in problem area; and coastal pollution.

Prevention is better than cure. This is particularly true in case of industrial pollution. Much of the problems of pollution and costs thereof can be avoided by preventing indiscriminate siting of industrial units.

An important pre-requisite for judicious siting of industries is to consider the environmental profiles of the proposed sites. In order to delineate the areas suitable for siting of industries of different categories based on the existing environmental features, a project for perpetration of District - wise Zoning Atlas has been taken by the Central Pollution Control board (CPCB) in collaborations with the State Pollution Control Boards and German technical Cooperation (GTZ). Various other agencies including National Atlas & Thematic Mapping Organisation (NATMO) and the National Remote Sensing Agency (NRSA) are also involved in this project.

The project was initiated in December 1994, and in the first phase, nineteen Districts in various States were taken up preparations of Zoning Atlas. Based on the experience gained in the first phase and encouraged by the positive response from all concerned, it is proposal cover the entire country at the earliest.

My colleague Mr. R.N. Raghubabu provided useful inputs for this issue.

(Dilip Biswas)
Chairman, CPCB



ZONING ATLAS FOR SITING OF INDUSTRIES

INTRODUCTION :

The carrying capacity of the environment is not unlimited and, more important, some areas or eco-systems are more susceptible to adverse environmental impacts than others. Unplanned and haphazard siting of industries might substantially increase the risk to the environment. Normally, even if an industry is presently not in an earmarked/notified industrial area, land use conversion is made based on clearance from environmental aspects and other considerations, such as availability of electricity, water supply, etc..

A proposed site for starting an industry is cleared from environmental angle, after reviewing its pollution potential and probable impact on the environment, by the State Pollution Control Boards and the State Environmental Committees or Site Clearance Committees. The site may turnout to be either suitable or unsuitable.

There are certain disadvantages in the present practice of not defining industrial areas, such as:

1. Due to scattered industrial development, combined treatment or disposal facilities, that may be much more economical and effective than providing facilities by industries individually, cannot be provided.
2. Pollution control programmes cannot be properly planned due to haphazard development. Also, decision making becomes difficult due to unplanned development.

The Present site clearance procedures insist on carrying out Environmental Impact Assessment (EIA) for certain projects. When an adverse impact is predicted as a result of the EIA, the impacts are nullified by changing the manufacturing process or the treatment technology. An industry cleared from environmental angle will, however, discharge pollutants as permitted upto a certain amount of tolerable levels. Such tolerable levels are set based on techno-economic feasibility considerations.



Due to lack of land use controls around the industrial sites, uses sensitive to pollution come up in the vicinity of the industrial areas. Discernible impacts, which are mainly depending on the distances to the receiving environment, are noticed due to such uncontrolled land use changes.

Environmental planning is a proven tool for reducing the impacts form such risks. Proper siting of newly planned industries and industrial estates is a strong pollution preventive instrument that ensures environmental soundness of the industrial development. It is the site that ultimately determines which water bodies might be affect by effluent discharged by and industry, which airshed might be affected by air pollutants or which ecosystems might be harmed. Site selection based on environmental criteria with the objective of minimising adverse environmental impacts is, therefore , a vital prerequisite.

The Central Pollution Control Board (CPCB) has initiated building up the tool of environmental planning in phases. It

is also aimed at simplifying and supporting the decision-making process on site clearance for locating an industry. Earlier CPCB had prepared industrial siting guidelines for the Ministry of Environment & Forests, as early as 1984. Subsequently, detailed guidelines were prepared for the Union Territory of Pondicherry in under the Indo-German bilateral programme. The results from these studies have been encouraging, emphasising the need for conducting such programmes at national level. CPCB in consultation with the State Pollution Control Boards (SPCBs) decided to rapier 'Zoning Atlas for Siting of Industries', based on environmental considerations, disrict-wise, throughout the country.

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ZONING ATLAS FOR SITING OF INDUSTRIES



2.0 THE ZONING ATLAS :

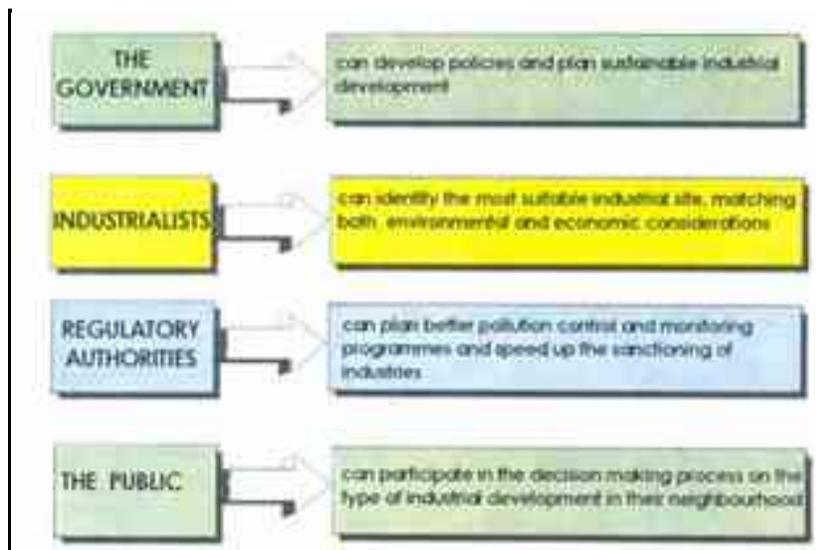
The Zoning Atlas for siting of industries, classifies the environment in a District and presents the pollution receiving potential of various sites/zones in the District and the possible alternate sites for industries through easy-to-read maps.

The Zoning Atlas, in addition to streamlining the decision-making process has several benefits some of which are given below:

- Provides a ready-reckoner for best suitable site and relevant environmental information;



- Provides a basis for incorporating environmental aspects into physical (land-use) planning process;
- Helps in planning cost-effective pollution control programmes;
- Helps in developing infrastructure facilities, such as roads, water supply, electricity etc. and providing common waste treatment and disposal facilities;
- Ensures that pollution potential of an industry is made compatible with the local conditions of the site;
- Helps in increasing awareness of the public on type of industries and nature of pollution anticipated in their neighbourhood well in advance;
- Helps in making the system of industrial clearance transparent; and
- Helps achieve sustainable development



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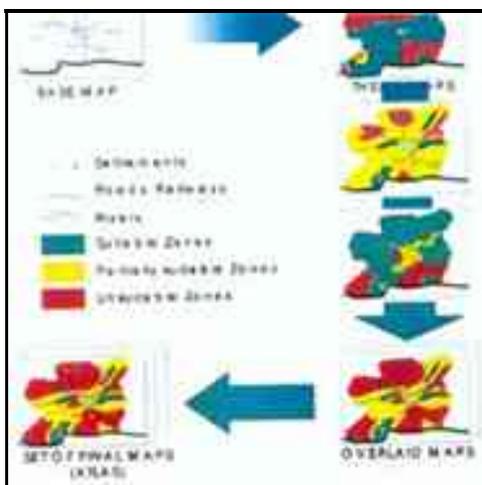
ZONING ATLAS FOR SITING OF INDUSTRIES

3.0 PROCEDURE FOR PREPARING ZONING ATLAS :

The work is initiated in selected Districts in the first instance. Priority of the Districts is fixed based on the following:

- Districts which have been declared for rapid industrial development by the Government;
- Districts that are facing pollution problems have potential for future growth; and
- Districts which are environmentally sensitive and need to be protected from pollution.

The approach involves carrying out of rapid study in 1:250,000 scale (1 cm = 2.5 km) and subsequently carrying out of detailed micro-level studies in 1:50,000 scale. The zoning for siting of industries is made through **overlaying** of thematic maps and by the method of **elimination** of areas unsuitable for industrial activity due to different environmental conditions of **sensitivity**. The approach involves identification of the characteristics of the District, mapping of the sensitive zones that are unsuitable for siting of industries owing to legal restrictions, physical constraints, social consideration etc. thereby assessing the pollution receiving potential of the District in terms of air/water (surface/ground) pollution and identification of possible alternate sites suiting to different types of pollution potentials of the industries. The master copies of all maps needed for working purposes will be stored on transparency films in 1:250,000 scale. However, for final presentation and dissemination of information for implementation or decision-making purposes, the maps will be published in A3 size. The procedure for preparing Zoning Atlas for a District is broadly categorised into six steps, as given below:



Step I : Preparation of the base map of the district;

Step II : Preparation of themes which show the physical features of the district (land use map, drainage, physiography, land capability etc.)

Step III : Identification of areas showing 'Sensitive Zones' which are unsuitable for industrial siting from environmental considerations/guidelines, legal restrictions and physical constraints

Step IV : Preparation of theme maps pertaining to air pollution sensitivity, surface water pollution sensitivity and ground water pollution sensitivity.

Step V : Preparation of 'Pollution sensitivity' maps based on overlay of theme maps and identification of:

- (a) possible alternate sites for location of industries based on the sensitivity of the sites to air and water

pollution and the risks associated with industrial siting; and

b) possible solid waste disposal sites based on the sensitivity to groundwater pollution.

Step VI Listing of the categories of industry suitable to various sites identified and providing guidelines for siting of industries and the site clearance procedures.

The following maps are included in the Zoning Atlas:

- ▲ characteristics of the District (physiography);
- ▲ unsuitable zones (sensitive zones);
- ▲ air quality related maps;
- ▲ water resources related maps (groundwater use, quality, river flow); and

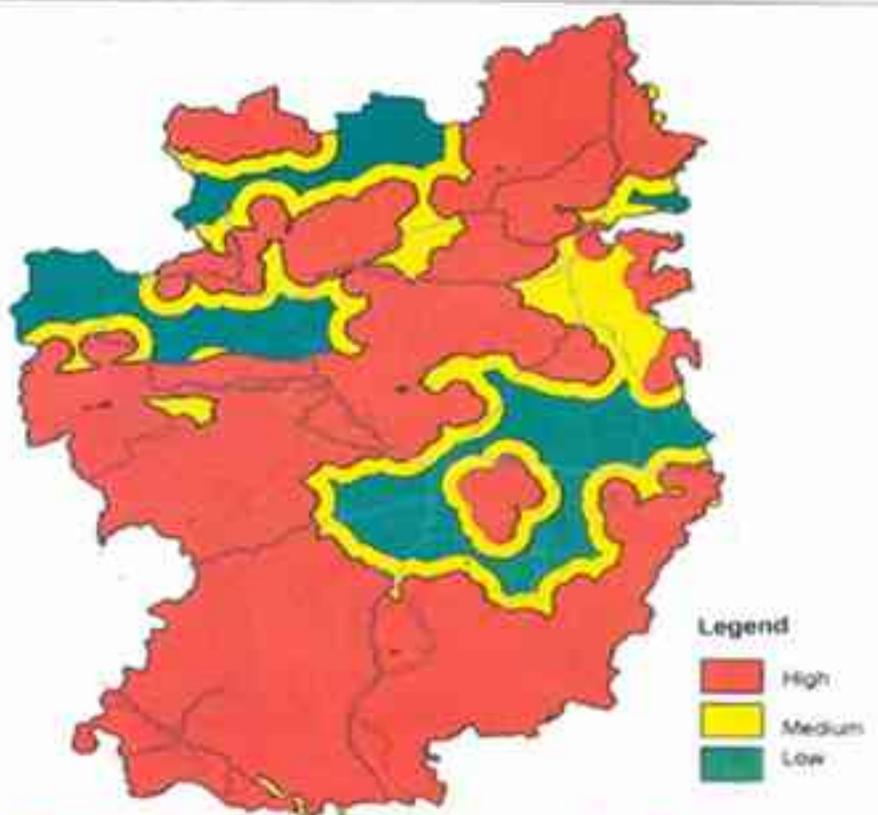


Fig. 1 Predicted Impact due to Air Pollution

- ▲ alternate sites/zones (suitability map showing possible alternate sites for various types of industries)

Schematic maps of predicted impacts due to air pollution, risks due to siting air polluting industries and suitable zones are shown in Figs. 1 through 3.

The required data for the project have been collected from a number of Government Departments, both Central and State. The maps are prepared using Geographical Information System (GIS), and computer software. The key Departments that turned out to be very resourceful for this project are:

- ▲ National Remote Sensing Agency, Hyderabad,

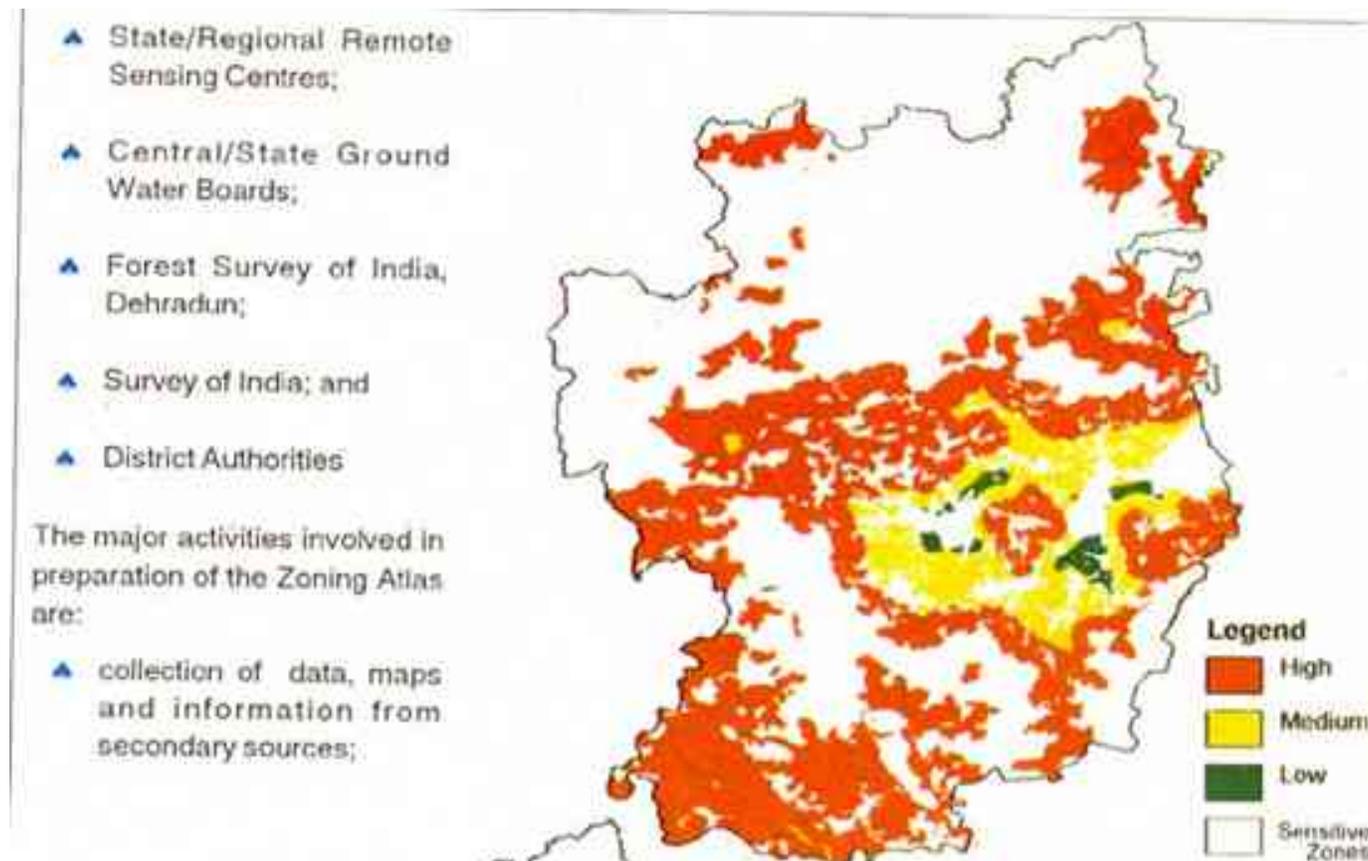


Fig. 2 Risks Due to Siting of Air Polluting Industries

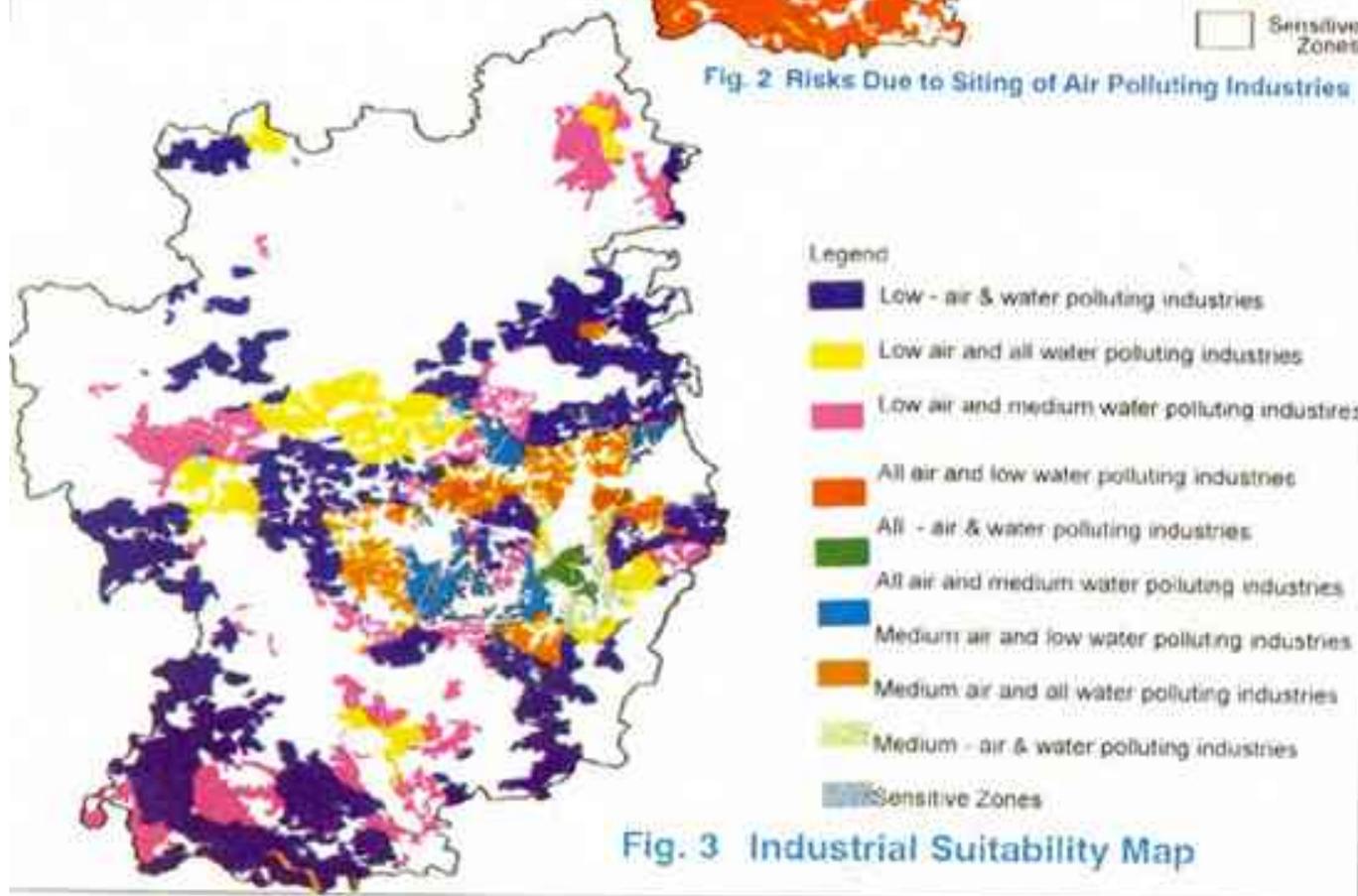


Fig. 3 Industrial Suitability Map

- preparation of base maps and various theme maps;
- survey of the district and monitoring of air surface water and ground water;
- digitisation of the maps;
- preparation of the draft report
- review of the report, maps and recommendations by the State departments, interaction meetwith industrial

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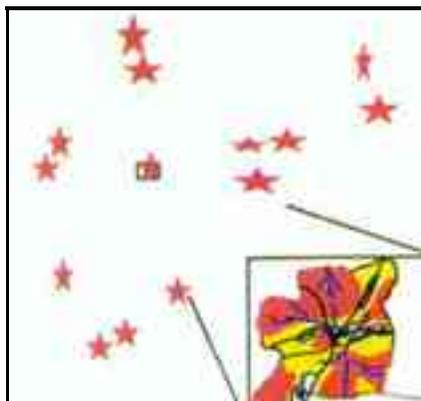


4.0 THE PROJECT :

In pursuance of the decision taken in the conference of the Chairmen and Member Secretaries of various State Pollution Control Boards, CPCB initiated the pilot phase of the Zoning Atlas project, in the Districts given in Table below:

S.No.	State	District
1.	Andhra Pradesh	East Godavari
2.	Assam	Goalpara and Kamrup
3.	Bihar	Singhbhum East and Singhbhum West
4.	Gujarat	Panchmahals
5.	Himachal Pradesh	Solan
6.	Karnataka	Mysore
7.	Kerala	Palakkad
8.	Madhya Pradesh	Chhiridwara
9.	Maharashtra	Ratnagiri
10.	Manipur	Central Manipur to (3 Districts)
11.	Orissa	Sundargarh
12.	Rajasthan	Udaipur and Rajasmund
13.	Uttar Pradesh	Ghaziabad
14.	West Bengal	Bankura

An Environmental Planning Group has been set up at CPCB with needed computer hardware and software and other cartographic equipment to provide training and needed technical support to SPCBs and for project planning, co-ordination, management and implementation. Teams have been established at SPCBs and training imparted on methodologies and procedures for preparation of Zoning Atlas.





The first part of the pilot phase has been completed in 17 Districts covering 12 States and most of the information has been stored digitally. As of now, follow-up actions are being taken up as under:

- review of the Atlas by respective departments in the State/District;
- interaction with local public, NGOs and industrial associations; and
- publication of the Atlas

Guidelines for siting of industries in the States of Manipur and Assam and Atlas for a few Districts will be ready by the end of 1996.

Micro-Level studies are being taken up as pilot studies in 3 States as a continuing study of the Zoning Atlas project to help local Governments identify industrial estates for polluting industries. The guidelines for carrying out such studies will be ready by March, 1997 and these guidelines will enable carrying out micro-Level studies in all the District where Zoning Atlas work has been completed

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7.0 RESULTS OF THE ATLAS PROJECT :

The resulting maps of Zoning Atlas include the sensitive zones where no industrial siting should be allowed and the possible alternate sites showing risks due to siting of industries with various types of pollution. The types of zones that will be available and their suitability of various types of polluting industries is given below:

Zone I:

Siting of any type of air and/or water polluting industries should not be allowed. Siting of industries with very low pollution potential (A3 and/or W3) may be considered based on micro-level studies (suitable for A3 W3 only);

Zone II :

Industries having high water pollution potential (W1) and/or any type of air pollution potential (A1/A2/A3) should not be allowed in these zones. Siting of industries with very low air pollution potential (A3) based on micro-level studies, and/or medium or low water pollution potential (W2/W3) may be considered (suitable for A3W2, A3W3 only);

Zone III :

Industries which are water polluting in nature (W1/W2/W3) but not having any type of air pollution potential (A1/A2/A3 -A3 based on local conditions) may be considered for siting in this zone (suitable for W1A3,W2A3,W3A3 only);

Zone IV :

Industries having air pollution potential whose impact is not likely to exceed 2 km (A2) or industries having very low pollution potential (A3) but not having any type of water pollution (W1/W2/W3 - W3 based on local conditions) may be considered for siting in this zone; Industries with high air pollution potential (A3) or high or medium water pollution potential (W2/W1) should not be allowed in this zone; (suitable for A2W3, A3W3 only);

Zone V :

Industries having air pollution potential whose impact is not likely to exceed 2 km (A2) or industries having very low pollution potential (A3) and/or having medium or low water pollution potential (W2/W3) may be considered for siting in this zone; Industries with high air pollution potential (A1) or high water pollution potential (W1) should not be allowed in this zone; (suitable for A2W2, A3W2, A3W3,A2W3 only);

Zone VI:

Industries having air pollution potential whose impact is not likely to exceed 2 km (A2) or industries having very low air pollution potential (A3) and/or water polluting in nature (W1/W2/W3) may be considered for siting in this zone; (suitable for A2W1, A2W2, A2W3, A3W1, A3W2, A3W3 only);

Zone VII:

Industries having air pollution potential of A1/A2/A3 but not having any type of water pollution (W1/W2/W3 -W3 may be considered based on local conditions) may be considered for siting in this zone; (suitable for A1 W3, A2W3, A3W3 only).

Zone VIII :

Industries having air pollution potential of A1/A2/A3 and/or having waste water discharges of only W2/W3 categories may be considered for siting in this zone; Industries having waste water of not easily biodegradable and toxic nature should not be allowed in this zone; (suitable for A1W2, A2W2, A3W2, A1 W3, A2W3, A3W3 only); and

Zone IX:

All types of air polluting industries (A1/A2/A3) and/or all types of water polluting industries (W1/W2/W3) may be considered for siting in this Zone ~II: zone; (suitable for A 1 W1, A 1 W2, A 1 W3, A2W1 , A2W2, A2W3, A3W1, A3W2, A3W3).

W3 category - industries with wastewater from domestic use/cooling or boiler blow downo (having no temperature variation and metals or other contaminants) or generating no wastewater or industries with complete recycling system/reutilization with 'Zero'discharge

W2 category - industries generating wastewater which is easily biodegradable and non-toxic, industries generating slur- ries and high temperature effluent

W1 category - industries generating wastewater of inorganic nature or organic waste of not easily biodegradable or toxic nature or combination of all and W2, W3 categories

A3 category - industries having emission only from boilers of steam generation capacity less than 2t/hr but not using coal, or noise of FdBA, or using DG sets upto 50 KVA

A2 category - industries with combustion emission from usage of coal 125 t/hr or equivalent,oor generating noise levels between 70-90dBA, or having diesel generator sets 50 KVA

A1 category - industries with emission from combustion of fuels using coal 125 t/hr or equivalent fuel, or industries having process emission emitted through organised let out system (stack) or having fugitive emission or odour nuisance, or in- dustries genE!rating noise levels of 90 dBA and above

S1 category - hazardous waste as defined under rule 3(i), 3(n) and 4 of the Hazardous Waste Management and Handling Rules, 1989 or waste water of not easily biodegradable and toxic nature.

S2 category - inorganic and organic compostable waste and all wastes with leachate potential or wastewater of easily biodegradable and non-toxic nature

S3 category - solid waste of inert nature. or no waste or with recycling arrangements. No discharge of waste water on land.

From the above zones, areas for development of industrial estates may be identified in consultation with other Depar1ments of the Government, such as the Industries Depar1ment, the Town & Country Planning Depar1ment, the Electricity Depar1ment, PWD, the Industrial. Development & Investment. - Corporation etc, With the Involvement of these, agencies, the economic considerations, such as water supply, electricity network, industrial development needs etc. will be taken care 'of. . Detailed micro-Ievel studies (region-based en- based on studies in 1: 250,000 scale and vironmental impact assessment) in an area of 25- km around each of the identjified sites should be While selecting such areas, preference may be given to wastelands.

The 'high risk' zones showr, in the groundwater sensitivity map are very sensitive to groundwater , polluting activities and hence, disposal of effluents or solid/hazardous waste on land should not be allowed, The 'medium' risk areas are suitable for controlled and limited discharges of only easily biodegradable and non-toxic effluents. The 'low risk areas provide scope for disposing hazardous wastes, based on micro-level studies.

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6.0 LIMITATIONS :

Data on environment related parameters are normally characterised by certain limitations regarding precision, accuracy, reliability and validity. These limitations should be known and considered by the use of such data. The following section summarises the limitations of the data and maps produced by the chosen approach for preparation of the Zoning Atlas.

- The concept provided covers only the macro level aspects, and for micro-level planning detailed studies are to be carried out. The information provided by the set of maps are primarily to be used for a reconnaissance of the planning area.
- The Zoning Atlas considers only the environmental aspects.
- The identified zones for industrial siting are based on studies in 1: 250,000 scale and based on available data. Hence, the conclusions drawn from this Atlas only provide guidelines for taking decisions on industrial siting and should not be considered as a consent to establish industries. Micro level detailed studies are to be carried out to evaluate environmental impact assessment {EIA } before taking decision on siting an industry.
- The conclusions in the present Atlas are on rapid EIA and hence in the identified industrial zones, even if the risks due to pollution are high/medium/low, there should not be any discharge of effluent/emission/waste without treatment and meeting the required environment standards.
- The industries adopting clean technology for manufacturing process may not have the pollution generation potential same as those without the clean technology process and hence may be suitable even of 'medium' and 'high' risk zones.

The Atlas and the recommendations have been developed based on the current scenario in the district. The Atlas needs modification/updating as and when the scenario of the land uses or the environmental quality or any theme (data/information) relating to air/water pollution sensitivity changes.

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7.0 CPCB PUBLICATIONS DURING JUNE, 1995 - MAY, 1996 :

1. An Inventory of Major Polluting Industries in Ganga Basin & their Pollution Control Status
2. National Ambient Air Quality Status of India -1992
3. Basin Sub-basin Inventory of Water pollution -Cauvery basin
4. Industry Specific Pollution Control Status in 'Problem Areas Vol.-III, (Greater Cochin , and Bhadravati)
5. Water Quality Statistics of India - 1991.
6. Coastal Water Quality Statistics (1987-1992)
7. Management of Municipal Solid Wastes Status and Options
8. Water Quality Atlas of India
9. Pollution Control Acts, Rules & Notifications Issued Thereunder (Third Edition)- Reprint
10. Paryavaran Pradushan Vaigyanik Evam Confectioneries takniki lekhon ka sankalan :1992 & 1993 (In Hindi)
11. Paryavaran Pradushan Vaigyanik Evam takniki lekhon ka sankalan :1994 (in Hindi)
12. Implementation Status of the Pollution Control Programme in Major Polluting industries.
13. Identification of hazardous Waste Generating Industry in Southern States (Andhra Pradesh, Kerala, Karnataka & Tamil Nadu).
14. Ambient Air Quality Survey of Major Traffic Intersections in Delhi
15. Standards for Liquid Effluents Gaseous Emissions Automobile Exhaust, Noise and , , .Ambient Air Quality
16. Status of Industrial Pollution Control , .Programme along the River Ganga 3. - (Phase-I)
17. Groundwater Quality in Problem Areas (Part-I)
18. Groundwater Quality in Problem Area (Part - II)
19. Groundwater Quality in Problem Areas (Part-III)
20. Groundwater Quality in Problem Areas (Part-IV)
21. Groundwater Quality in Ten Towns of Uttar Pradesh
22. Comprehensive Industry Document on Soft Drink Manufacturing Units, Bakeries and Confectioneries
23. Cleaner Technology -Issues and Options
24. Proposal for the Ninth Plan
25. Review of Environmental Statements
26. Basin Sub-Basin Inventory of Water Pollution Industries -Godavari Basin
27. Rationale in Evolution of Standards for , Industrial Effluents and Emissions
28. Paryavaran Pradushan Karan Aur Nivaran (in Hindi) -Revised

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Bio-Monitoring of Water Quality in Problem Areas - April 2001
Environmental Management System- February 2001
Common Effluent Treatment Plants - November 2000
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Clean Coal Initiatives - June 2000
Bio-Mapping Of Rivers - March 1999
Auto Emissions - June 1999
Technologies for Pollution Control Industry - October 1999
Hazardous Waste Management - June 1998
Plastic Waste Management - September 1998
Municipal Solid Wastes - June 1997

[Cleaner Production Options for Pulp & Paper Industry - Sept 1997](#)

[Zoning Atlas For Siting Industries - June 1996](#)

[Bio-Monitoring of Water - September, 1995](#)

[Assessment and Development Study of River Basin - March 1995](#)

[Depletion of Ozone Layer and Its Implications - September 1994](#)

[Agro - based Industries - December 1994](#)
