

Kitakyushu Initiative for a Clean Environment: Successful and Transferable Practices

Zhenjiang (China): Environmental Information Disclosure System

Policy Research Center for Environment and Economy¹

Target Area: Overall urban environmental management

Time Period: 1997-

| <u>Contents</u> | <u>Page</u> |
|--|--------------------|
| 1. Background: Overview of Zhenjiang City | 2 |
| 2. State of urban environment and major environmental problems | 3 |
| 2.1 Industrial sources | 3 |
| 2.2 Quality of environment | 4 |
| 2.3 Major urban environmental problems | 5 |
| 3. Integrated urban environmental management | 5 |
| 4. Environmental information disclosure system | 6 |
| 4.1 Background | 7 |
| 4.2 Indicators and grading system | 7 |
| 4.3 Mechanism and procedure for implementation of EIDS | 9 |
| 4.4 Effectiveness of EIDS | 11 |
| 5. Discussions | 12 |

| <u>Tables and Figures</u> | <u>Page</u> |
|--|--------------------|
| Fig 3-1 Economic situation of Zhenjiang (2000) | 2 |
| Fig 3-2 Air pollutant emissions from industrial sources | 3 |
| Fig 3-3 Water pollutant discharge for industrial sources | 4 |
| Fig 3-4 Annual average level of ambient concentration of SO ₂ , NO _x , TSP | 4 |
| Fig 3-5 Conceptual scheme of automatic grading system of EIDS | 10 |
| Fig 3-6 Procedure of implementation of EIDS | 11 |
| Fig 3-7 Share of each grade in 1999 and 2000 | 12 |
| Table 3-1 Social and economic development of Zhenjiang (1996-2000) | 2 |
| Table 3-2 Structure of industrial sector in Zhenjiang (2000) | 3 |
| Table 3-3 Water quality of major surface waters (2000) | 5 |
| Table 3-4 Indicators assessing corporate environmental behaviour | 8 |
| Table 3-5 Grading system of corporate environmental behaviour | 9 |

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1. Background: Overview of Zhenjiang City

Zhenjiang City is situated in the northern part of China's Jiangsu Province and the south bank of the downstream of Yangtze River. Zhenjing City covers 3843 km², of which 1964 km² is hilly and mountain land and 526 km² is water area. The urban area is around 60.2 km².

A city under the jurisdiction of Jiangsu Provincial Government, Zhenjiang City has four counties /county level cities (Dantu County, Danyang City, Yangzhong City and Jurong City) and three districts (Jingkou District, Runzhou District and Zhenjiang New District).

In 2000, Zhenjiang City achieved GDP of 45.2 billion RMB, GDP per capita of around 17,044 RMB and gross industrial output value of RMB85.4 billion (fixed price of 1990). The social and economic development of Zhenjiang City from 1996 to 2000 is shown in Table3-1. The economic structure described in the ratios of agricultural sector, industrial sector and service sector is illustrated in Figure3-1.

Table 3- 1 Social and Economic Development of Zhenjiag City (1996-2000)

| Year | GDP (billion RMB) | Population (1000 persons) | GDP Per Capita (RMB) | Gross Industrial Output Value (billion RMB) |
|------|----------------------|------------------------------|-------------------------|--|
| 1996 | 33.51 | 2648 | 61.9 | 12655 |
| 1997 | 36.05 | 2654 | 66.4 | 13583 |
| 1998 | 39.05 | 2656 | 71.1 | 14703 |
| 1999 | 41.65 | 2661 | 78.2 | 15727 |
| 2000 | 45.20 | 2667 | 85.4 | 16967 |

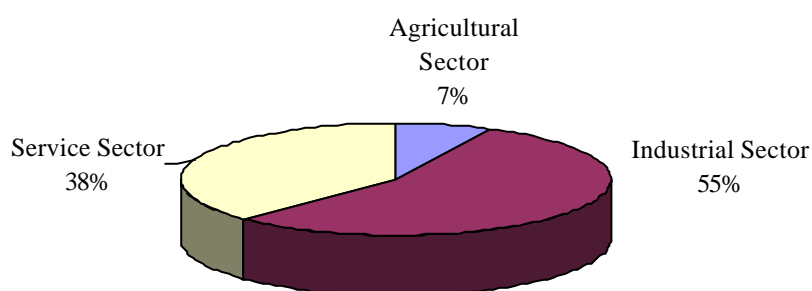


Figure 3- 1 Economic Structure in Zhenjiang City (2000)

The structure of top ten industrial sectors in Zhenjiang City is shown in Table3-2.

Table 3- 2 Structure of Industrial Sector in Zhenjiang City (2000)

| Sector | Number of Enterprises | Gross Industrial Output Value (million RMB) |
|---|-----------------------|---|
| Chemical material and chemical product sector | 111 | 6943.2 |
| Electrical equipment sector | 155 | 5508.3 |
| Metal product sector | 95 | 4820.0 |
| Paper making and paper product sector | 20 | 4645.0 |
| Electronics and communication equipment sector | 23 | 4039.4 |
| Nonmetallic product sector | 94 | 3127.0 |
| Textile sector | 70 | 2934.3 |
| Clothes and synthetic fiber product sector | 77 | 2310.2 |
| Transportation equipment sector | 61 | 2266.2 |
| Food processing sector | 31 | 2088.5 |
| Subtotal | 737 | 38682.1 |
| Share of top ten industrial sectors in the total of Zhenjing City | 64.4% | 74.3% |

2. State of Urban Environment and Major Environmental Problems

2.1 Industrial Sources

With the expansion of the scale of industry, the level of industrial emissions increased steadily. However, emissions of major air pollutants decreased due to effective environmental management (see Figure3-1). The discharges of industrial water pollutants showed same declining trend (see Figure3-2).

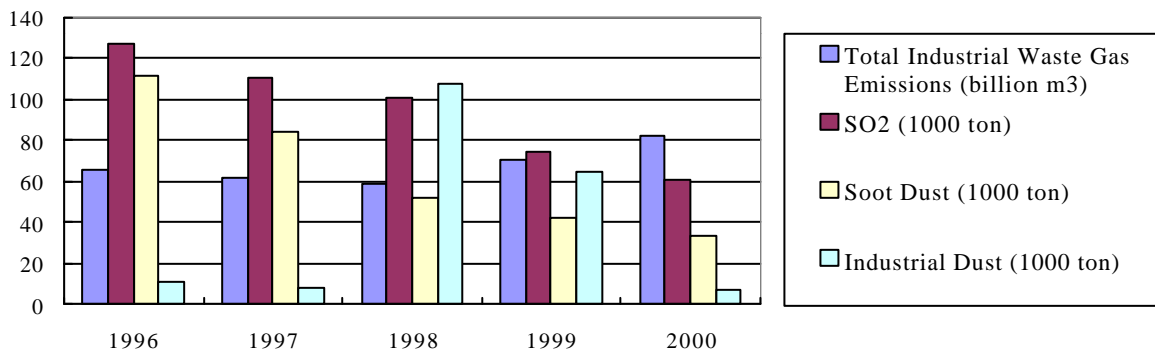


Figure 3- 2 Air Pollutant Emissions from Industrial Sources in Zhenjiang City

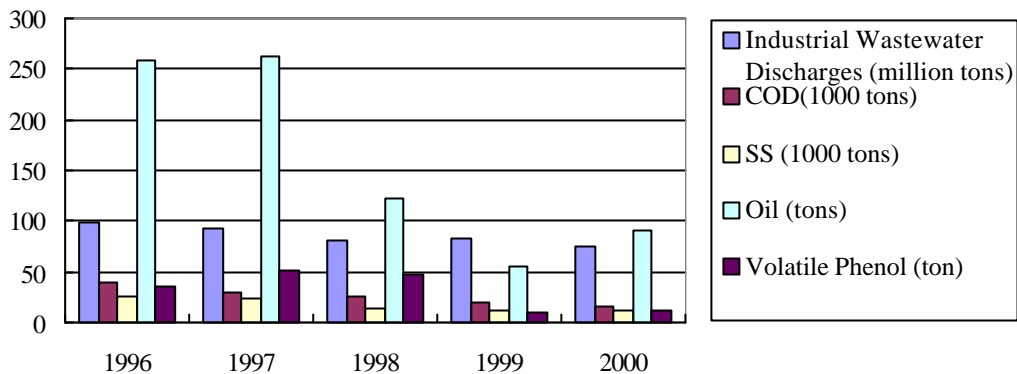


Figure 3-3 Water Pollutant Discharges from Industrial Sources in Zhenjiang City

4.2 Quality of the Environment

Contrasting with the National Ambient Air Quality Criteria (GB3095-1996) Class II, the ambient concentrations of SO₂ and NO_x air in urban area complied with Class II criteria in 2000, and the ambient concentration of TSP in urban area exceeded Class II criteria, reflecting that particulate is one of the major factors influencing the urban air quality. The annual average ambient concentrations of SO₂, NO_x and TSP in the past several years are shown in Figure3-4. The level of ambient NO_x concentration and TSP concentration kept, while the ambient concentration of SO₂ decreased evidently due to effective control of total SO₂ emissions.

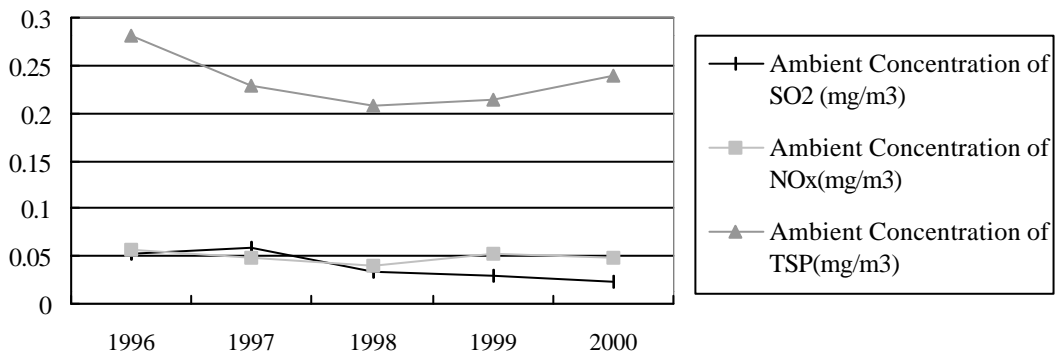


Figure 3-4 Annual Average Level of Ambient Concentration of SO₂, NO_x and TSP

Of major surface waters, the water quality of Yangtze River main stream - Zhenjiang section reached National Surface Water Quality Criteria Class II in 2000. The water quality of Inland River generally complied with Class III criteria and major water pollutants included oil and non-ionic ammonia. The water quality of Sunan Canal – Zhenjiang section reached Class III criteria and major pollutants are non-ionic ammonia, oil and DO. The water quality of Gu Canal complied with Class IV criteria, showing organic pollution with major pollutants including BOD, DO and permanganate index. The water quality of major surface waters in Zhenjiang City is shown in Table3-3.

Table 3- 3 Water Quality of Major Surface Waters in Zhenjiang City (2000)

| Waters | Major Water Pollutants (mg/L) | | | | | |
|--------------------------|-------------------------------|------------------|---------|-------------------|-----------------|------|
| | Permanganate Index | BOD ₅ | Cyanide | Non-ionic Ammonia | Volatile Phenol | Oil |
| Yangtze River mainstream | 2.4 | 1.2 | 0.002 | 0.008 | 0.001 | 0.02 |
| Inland River | 3.6 | 3.1 | 0.002 | 0.018 | 0.001 | 0.10 |
| Sunan Canal | 4.8 | 2.4 | 0.006 | 0.080 | 0.004 | - |
| Gu Canal | 11.0 | 18.6 | 0.006 | 0.116 | 0.008 | - |

2.3 Major Urban Environmental Problems

Since environmental protection was not paid great attention by local government in the path of rapid economic development, Zhenjiang City went through polluting first and cleaning-up afterwards as experienced by many industrialized countries. Major environmental problems are summarized as follows:

- Such polluting industrial sectors as cement sector, pulp and paper making sector, thermal power generation sector and ferrous metal smelting sector developed rapidly, showing evident structural pollution;
- In the early stage of urban development, environmental protection was not integrated into urban planning and distribution of industries, which resulted in pollution conflicts among industrial area, residential district and business section;
- The city lacks complete urban sewage collection systems and treatment plants, showing weak environmental infrastructure;
- The scale of industry is usually small and technologies are low, which resulted in the phenomenon of “high production, high consumption and high pollution”.

3. Integrated Urban Environmental Management

In response to these urban environmental problems, which have had certain impacts on local citizen’s daily life and become barriers to local economic development, the local government implemented many effective measures as follows:

(1) Strengthening the institution of environmental protection

The environmental protection bureaus of various levels were established in municipal government, county-level government and district government, responsible for local environmental protection

work. Urban environmental monitoring centers and urban environmental surveillance teams provided guarantee of environmental monitoring and environmental surveillance for urban environmental management.

(2) Strengthening environmental enforcement

The local environmental protection administration investigated and punished various environmental non-compliance and local government enforced shut-down policy to more than 70 small polluting enterprises. Since the implementation of the action program of environmental compliance in 1996, which required all industrial enterprises should comply with relevant emission standards, 344 non-compliance enterprises have been ordered to conduct emission abatement by a specified deadline.

(3) Strengthening the construction of environmental infrastructure

The municipal government got loans from the World Bank and invested 300 million RMB in constructing dam system of urban sewage. The sewage water has received preliminary treatment.

(4) Strengthening an integrated renovation of urban environment

More than 20 polluting enterprises such as The Second Chemical Engineering Factory, Zhenjiang Dying Factory and Huangshan Cement Factory, which were located in the residential district and caused significant environmental impacts, were ordered to move and conduct abatement.

(5) Accelerating the innovation of traditional industries

The municipal government supported to the introduction and construction of many large-scale invested, high-tech and better equipped projects. The scales of traditional industrial sectors including paper-making, cement industry and chemical engineering expanded while the emission level per unit production of these sectors reduced sharply.

(6) Stressing on environmental institutional innovation and highlighting the effectiveness of urban environmental management

Zhenjinag City played a leading role in the country in initiating the Environmental Protection Inquisitional System of Construction Project and the Environmental Information Disclosure System. The urban environmental management is strengthened by the implementation of new systems.

As a result of the above measures taken by the municipal government, the situation of environmental deterioration has been curbed and the emission level of major pollutants dropped (see Figure 3-2 and Figure 3-3).

4. Environmental Information Disclosure System

Among these measures, the implementation of Environmental Information Disclosure System (EIDS) by Zhenjiang City is distinguished and proven a successful experience for urban

environmental management.

4.1 Background

Though the corporate liabilities of pollution abatement and environmental protection were identified in relevant state environmental protection laws and regulations, enterprises usually did not conduct pollution abatement actively and waited for inspection and pushes. On the one hand, most of the enterprises regarded pollution abatement a burden to satisfy the requirements of environmental administration rather than selves responsibilities to the society as well as to the future generations. On the other hand, environmental administration over environmental non- compliance is considered a barrier to corporate operation and local economic development, which cause passive and very weak enforcement.

With the form of market economy and China's accession to the WTO, corporate image becomes more and more important to the competitiveness and development of an enterprise. The disclosure of corporate environmental behavior to the public will not only let the citizens enjoy the know rights, but also make the society an effective supervision over corporate environmental performance. By the implementation of this system, the enterprises will be aware that shaping good corporate environmental image is not the responsibility of government but the responsibility of itself.

In 1997, the Zhenjiang Municipal Environmental Protection Bureau (EPB) in collaboration with Nanjing University conducted a research on information disclosure system of corporate environmental behavior under the assistance of the World Bank. On the basis of international experiences of environmental information disclosure, the local EPB designed a set of feasible indicators assessing corporate environmental performances and formulated the EIDS to make the corporate environmental behavior public. The system was implemented in Zhenjiang's urban area on a trial basis.

4.2 Indicators and grading system

Corporate environmental behavior covers many aspects including emission level of water pollutants and air pollutants, state of environmental compliance and pollution abatement, corporate environmental management and sustainable improvement, etc. To make all these information of corporate environmental behavior to the public will not be understandable and acceptable. Therefore, 15 indicators were selected (see Table3-4) 5 colors were designed representing the grading criteria of corporate environmental behavior (see Table3-5). The conceptual scheme of the automatic grading system is shown in Figure3-5.

Table 3- 4 Indicators Assessing Corporate Environmental Behavior

| No. | Indicator | Notes |
|-----|---|---|
| 1 | Emission compliance | The rate of emission compliance of major controlled pollutants from all outlets should be greater than and equal to 80% or the average concentration of major controlled pollutants should comply with relevant emission standards. The rate of disposal/utilization of hazardous wastes should be 100%. |
| 2 | Repeated occurrence of environmental non-compliance | The ratio of non-compliance to the frequency of environmental inspection and monitoring is greater and equal to 50%. |
| 3 | Total volume control | <ul style="list-style-type: none"> - Enterprise which holds pollutant discharge permit should comply with the requirements of the permit. - Enterprise which do not have pollutant discharge permit should comply with emission standards. |
| 4 | Environmental non-compliance | Enterprise has one or more records of non-compliance according to on-site environmental inspection. |
| 5 | Environmental pollution accident | <p>i) General accident: once or more times occurrence of pollution accident with direct economic loss over 1 000 RMB and lower than 10 000 RMB.</p> <p>ii) Serious accident (at least one of the following four situations):</p> <ul style="list-style-type: none"> - Direct economic loss caused by the accident is greater than 10 000 RMB and lower than 50 000 RMB; - Poisoning symptom occurred; - Conflicts among citizens and the enterprise caused by the accident happened; - The accident causes environmental damage. <p>iii) More serious accident (at least one of the following five situations)</p> <ul style="list-style-type: none"> - Direct economic loss caused by the accident is greater than 50 000 RMB and lower than 100 000 RMB; - The poisoning occurred leads to potential permanent disability; <p>iv) The most serious accident: direct economic loss caused by the accident is greater than 100 000 RMB.</p> |
| 6 | On-time payment of pollution levy | Enterprise pays for pollution levy on time in at least 70% of twelve months of a year and pays for pollution levy within 2 months in the left months of a year. |
| 7 | On-time reporting of emissions | Enterprise finishes annual reporting of emissions on time. The Enterprise, which holds pollutant discharge permit, reports its monthly emissions on time. |
| 8 | Standardized emission outlet | <ul style="list-style-type: none"> - The emission outlets should be checked and accepted by EPB if the enterprise has the liability of pollution abatement. - The emission outlets if not specified should be standardized. |
| 9 | Implementation of the System of “Three Synchronous Requirements” and environmental management procedure for construction projects | <ul style="list-style-type: none"> - Enterprise should conduct environmental protection preliminary hearing on time when proposes the project. - Enterprise should conduct environmental impact assessment on time when conducts the feasibility study. - Enterprise complies with the requirements defined by the Regulation of Environmental Management of Construction Project. |
| 10 | Corporate environmental organization Corporate environmental protection staff Corporate environmental management system | <p>Enterprise has environmental organization.</p> <p>Enterprise has full-time or part-time environmental protection staff.</p> <p>Enterprise has corporate environmental management systems to fulfill corporate environmental management task.</p> |

| | | |
|----|--|---|
| 11 | Comprehensive utilization rate of industrial solid wastes greater than or equal to 80% | Disposal rate of industrial solid wastes should be 100% and the comprehensive utilization rate of industrial solid wastes greater than or equal to 80%. |
| 12 | Repeated occurrence of public complains | The municipal government receives more three times of public complains and corporate environmental performance causes certain environmental impacts and damage. |
| 13 | Occurrence of public complain | The municipal government receives once public complain and corporate environmental performance causes certain environmental impacts. |
| 14 | Cleaner production | Enterprise passes cleaner production audit and corporate environmental management reaches domestic top level and advanced international level. |
| 15 | ISO 14000 certification | Enterprise passes ISO 14000 certification and gains certificate. |

Table 3- 5 Grading System of Corporate Environmental Behavior

| Grading System | Criteria |
|----------------|---|
| green | On the basis of blue color, enterprise obtains ISO 14000 certificate or passes cleaner production audit. Corporate environmental management reaches advanced level. |
| blue | The emission level is lower than relevant national emission standard. Enterprise has high level corporate environmental management. |
| yellow | The emissions on the whole comply with relevant national emission standard. Emission level exceeding relevant national emission standard or non-compliance occurs occasionally. |
| red | Emissions can not comply with relevant national emission standard or more serious pollution accident happens. |
| black | Emission level greatly exceeds relevant national emission standard and causes serious environmental impact or the most serious pollution accident happens. |

4.3 Mechanism and procedure for implementation of EIDS

In 2000, Zhenjiang Municipal Environmental Protection Bureau submitted to the municipal government the *Opinion on the Implementation of Environmental Information Disclosure System in Zhenjiang*. The *Opinion* was accepted by the municipal government and transmitted to relevant governmental sectors. In addition, the municipal government established a Leading Group on the implementation of EIDS, with municipal governmental official being the group leader, Zhenjiang Municipal Environmental Protection Bureau playing the leading role and relevant sector participating in the Leading Group.

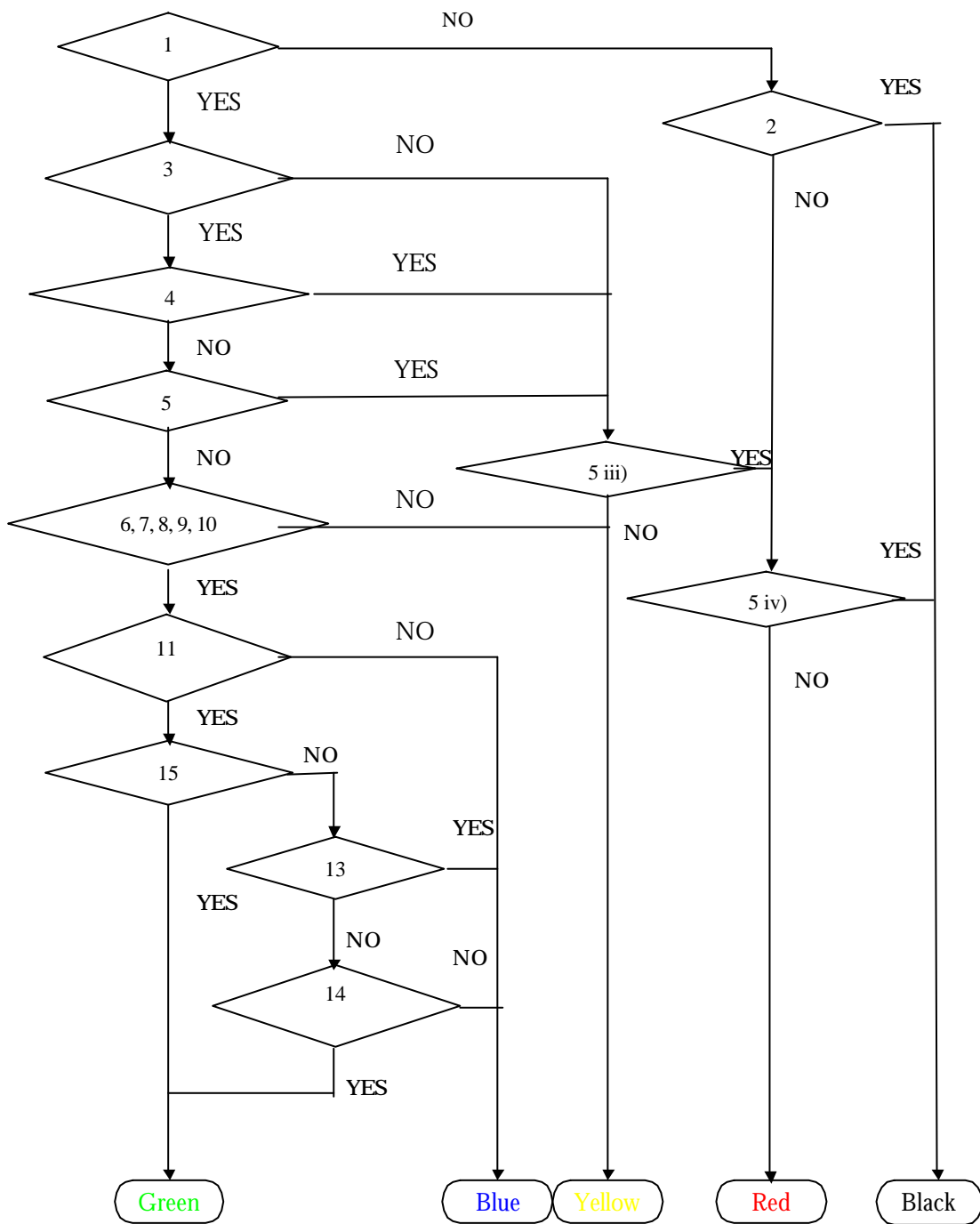


Figure 3- 5 Conceptual Scheme of the Automatic Grading System of EIDS

Note: 1,2,3,4,5,6,7,8,9,10,11,13,14,15 represent 14 indicators assessing corporate environmental behavior in Table 4.

On July 6, 2000, the Municipal Environmental Protection Bureau issued a *Circular on the*

Implementation of Environmental Information Disclosure System in Zhenjiang, defining the scope of target enterprise participating in the EIDS, the grading system of corporate environmental behavior, indicators assessing corporate environmental behavior, assessing diagram, period and agenda of information disclosure, and procedure of implementation.

In the trial stage, the scope of target enterprise is limited to industrial enterprises which are located in the urban area. The period of information disclosure is on a year basis. The preliminary results of grading will be finished in February next year and will be sent to each target enterprise in written notification by the Office of EIDS in March. Target enterprise will submit feedback opinions to the Office in seven days. The Leading Group will finalize the grading results after discussing those feedback opinions. In April, the grading result of all target enterprises will be publicized via mass media. The procedure of the implementation is shown in Figure3-6.

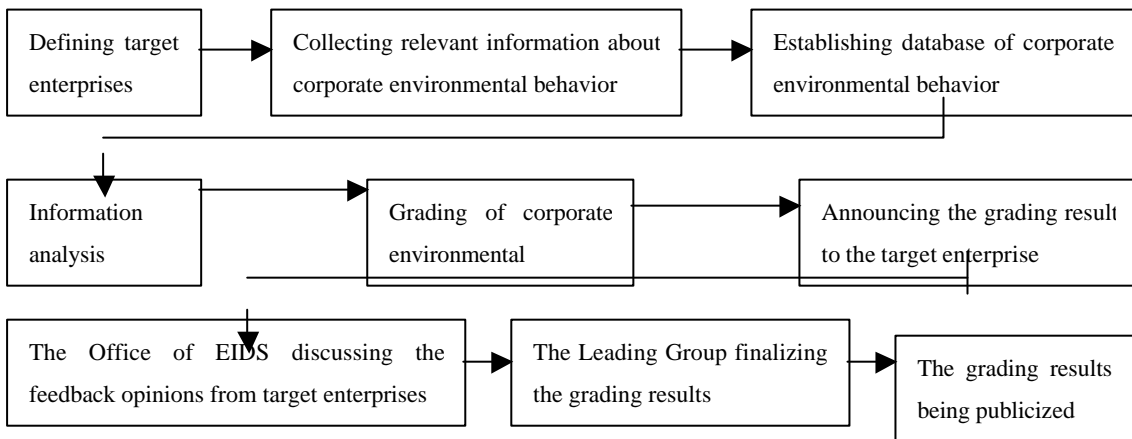


Figure 3- 6 The Procedure of the Implementation of EIDS

4.4 Effectiveness of EIDS

The EIDS has been implemented in Zhenjiang City for two years since 2000. 91 target enterprises and 105 target enterprises were included in 1999 and 2000, respectively, covering more than 90% of total emission loads in the urban area. The share of each grade represented by 5 colors is shown in Figure 3-7.

In Figure3-7, we know that the share of blue color representing environmental compliance is dominant, while green color and black color representing the best and the worst corporate environmental behavior respectively have limited share. In addition, figure 6 shows that though the target enterprises in 1999 were not the same as in 2000, the colors changed slightly. Blue color, yellow color and red color kept stable, however, green color increased 1 percent and black color dropped 1 percent.

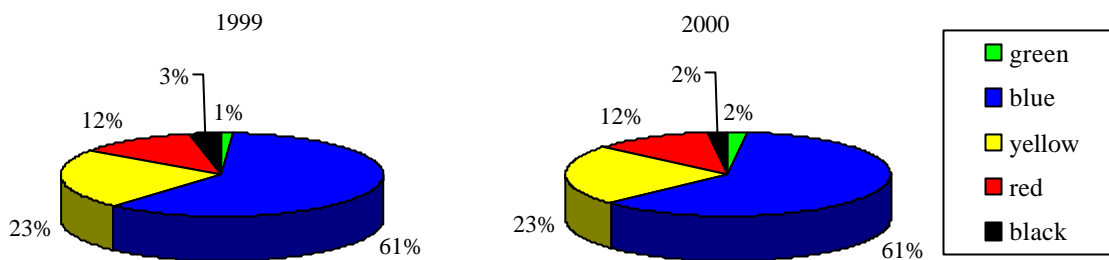


Figure 3- 7 Share of Each Grade in 1999 and in 2000

Since the EIDS was implemented for only 2 years, its effectiveness on influencing corporate environmental behavior was not evident. Some target enterprises in 1999 upgraded their color in 2000 and some others degraded their color. However, most target enterprises paid great attention to this system and expressed to improve their environmental behavior. The EIDS has shown its influences on corporate environmental awareness as well as public environmental awareness.

5. Discussions

The use of information approach to industrial pollution control has been proven in some countries an efficient complementary approach to current regulatory system and regarded as the third wave in the history of industrial pollution control. The first wave is the application of command and control (C&C) measures, when the government regulates on pollution and achieves the goal of pollution control and environmental protection. However, C&C measures often induce unnecessary socio-economic losses, and the second wave of market based instruments (MBI) for pollution control came into being as a consequence. The use of MBI increases the flexibility of pollution control and improves the efficiency of pollution control.

Still, the problem of pollution is not yet being solved, and the main reason is high operational cost of both C&C measures and the MBI, which is especially the case in developing countries, where imperfect legal systems, insufficient environmental protection funds and inadequate human resources had greatly decreased the effectiveness of pollution control system.

The information approach refers to the disclosure of information of environmental performance of industrial polluters through the media. On the one hand, with the development of the economy and the improvement of living standard, people are paying more and more attention to the quality of the environment. The mechanism of public participation in environmental management is developing gradually. The rights for being informed are becoming common to the public and laws. On the other hand, with the establishment of the modern corporate management systems in China, the

environmental performance of enterprise has been an important part of integrated image of enterprise, and also a crucial factor to influence the competitiveness of enterprise in the market. Therefore, it is a powerful incentive by publicizing the environmental performance of enterprises and related environmental information, to let people know, inspect and evaluate their emissions and pollution abatement.

The information disclosure strategy can impose pressure and provide appraisal to industrial pollution control through the community, the public and the market. A proven effective approach with a low operational cost, the public information approach can provide strong incentives for industries to control their pollution.

The experiences of information approach in China may be valuable to other developing countries who intend to introduce this kind of approach.