IDE Spot Survey

Social Capacity Development for Environmental Management in Asia

Japan's Environmental Cooperation after Johannesburg Summit 2002

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INSTITUTE OF DEVELOPING ECONOMIES

IDE-JETRO

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Executive Summary

0.1 New Concepts for International Cooperation

This report presents Social Capacity for Environmental Management (SCEM) and Social Environmental Management System (SEMS), new concepts for evaluating process of capacity development in environment in developing countries and for proposing appropriate international cooperation approaches for the development stages.

The situations surrounding environmental cooperation are actively changing in a decade after the Rio Summit in 1992 and one of the biggest features in the early 21st century is the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa in August and September 2002 which was supposed to test the achievements and shortcomings of performance during the period. From the discussions at the Summit, what lessons did we get and what can we say for further cooperation in the future? This report, with the new concepts for international cooperation, gives answers to these questions as well as reviews historical development of cooperation approaches for developing countries especially which are experiencing rapid economic growth and industrial pollution.

0.2 Social Capacity for Environmental Management and Social Environmental Management System

Social Capacity for Environmental Management (SCEM) is defined as capacity to manage environmental problems as a whole society of the main three actors; government, firms, and citizens. Seen from the viewpoint of new institutional analysis [North 1990], this concept can be turned into a systematic framework, Social Environmental Management System (SEMS). The three main actors themselves and interrelations among the three form the system. And also the relations between national level and local level are much of importance in the framework since actual problems occur at local level and local firms and citizens have most things to do with the solutions while overall environmental policies and laws are established at national level. SEMS, therefore, basically consists of the three actors, two levels and in-between interactions.

The research owes a number of previous works by academicians and donor agencies for its fundamental background but the concepts try to reorganize and integrate them to a new systematic analysis framework in two ways. One is that they summarize the conventional two major streams for development and cooperation; capacity development and (environmentally) sustainable development. Another is that with this framework we can grasp dynamic aspects of environmental management and international cooperation in a society and propose optimum involvement of the internal and external actors.

0.3 Development Stages, Benchmarks and Indicators

The stages and essential benchmarks of SEMS in developing countries are presented in Chapter Two. SEMS has three development stages.

System-making stage: Fundamental functions of SEMS especially in the government sector are developed (environmental law system, environmental administration and environmental information).

System-working stage: The system starts actually working to improve the environmental quality with some active interactions among the actors.

Self-management stage: Comprehensive environmental policy is set enforced and the system develops sustainably through strong interrelations among the actors.

A set of evaluation indicators of SEMS which have four processes (monitoring, analysis and evaluation, policy-making, and policy implementation) and six factors (law and policy, human resources, organizations, financial resources, infrastructure, and information, knowledge and technology) in each actor are also proposed in the chapter.

0.4 Case Studies

Chapter Three applies the SEMS framework and important indicators to selected Asian countries of China, Thailand and Indonesia. China completed its system-making stage and entered the system-working stage around in 1994 and now it is shifting toward the self-management stage. China's social environmental management will accelerate toward the Beijing Olympic Games which will be held in 2008.

Thailand was once ready for the system-working stage around in 1995 but some more time is needed to finalize the system-making due to the financial crisis in 1997. It is in the mixed period of restructuring the system and shifting to the system-working stage. Indonesia does not have enough environmental information system and, same as Thailand, the financial crisis and recent administration restructure give the country some difficulties in driving environmental management well.

The appropriate input timing of environmental cooperation is also discussed. The cases of Environmental Center project show that it is most effective to apply Environmental Center approach in the shifting period from the system-making to the system-working stage as observed in the case of China. It is because the center is expected to contribute to environmental policy making and implementation with its popular project components of monitoring, research and training and needs a social system which the fundamental functions are developed enough to utilize the outputs of the Environmental Center.

Chapters Four to Six are written by local experts in the three countries based on the SCEM and SEMS concepts. In Chapter Four, Zhou Xin, Research Associate at Policy Research Center for Environment and Economy of the State Environmental Protection Administration assesses historical development of China's SEMS and observes five stages since 1949 to present by presenting the original time-situation-pressure-response (TSPR) matrices. In the review of Japan's cooperation since 1992, the Sino-Japan Friendship Center for Environmental Protection is regarded as an accumulator of good experiences in bilateral and international cooperation, pointing out the characteristics; demand-oriented cooperation, mutually promoted cooperation, comprehensive and all-sided function, adoption of a proper operation mechanism, and opening cooperation.

In Chapter Five, Qwanruedee Chotichanathawewong, Director of Energy, Industry and Environment Program at Thailand Environment Institute reviews environmental policy instruments in Thailand with its focus on internal and external social pressure on market as an accelerator of voluntary approaches. The latter half of the chapter evaluates Japan's cooperation to Environmental Research and Training Center based on the well-known five criteria of Development Assistance Committee, Organization for Economic Cooperation and Development. The chapter concludes that good personnel and competence in the environmental consulting market are essential to get ready for the possible privatization (fully or partly) of the center.

Chapter Six is prepared by Setyo S. Moersidik, Professor and Director of Centre for Research of Human Resources and the Environment, University of Indonesia. This chapter discusses how government structural change and decentralization affect social environmental management in Indonesia and

how Japan-supported Environmental Management Center can contribute to further development of SEMS. Furthermore, SEMS framework is expanded to program planning and implementation by Indonesian government and donor agencies.

The concluding chapter presents lessons and future directions of Japan's international environmental cooperation.

(Shunji MATSUOKA and Akifumi KUCHIKI)

Note:

This report is one of the outputs of a research group on "Social Capacity Development for Environmental Management in Asia: Japan's Environmental Cooperation after Johannesburg Summit 2002"in FY2002 at Institute of Developing Economies, Japan External Trade Organization. At the same time, the research group contributed to the international workshops on Social Capacity Development for Environmental Management and International Cooperation in Asia organized by Hiroshima University, Institute of Developing Economies and Japan International Cooperation Agency (JICA) in January 2003 in Hiroshima and Tokyo, and also some of the contributers were involved in the evaluation report *"Environmental Center Approach:Development of Social Capacity for Environmental Management in Developing Countries and Japan's Environmental Cooperation"* submitted by the Evaluation Team on Environmental Cooperation, Japan Society for International Development to JICA in March 2003.

Chapter 1

Introduction: Environmental Issues and Japan's ODA in Asia

1.1 Japan's ODA in Transition

The objective of this report is to analyze the development of social capacity for environmental management in industrializing Asian countries and produce new ideas for Japan's future international cooperation.

International trends in environmental cooperation have been continuously changing since the early 1990s. The United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 was one of the biggest events in its initial period. With the start of the 21st century, international cooperation also entered a new era, including environmental cooperation. In September 2000, the United Nations announced Millennium Development Goals (MDGs) for the target year 2015. As shown in Table 1, there are eight main objectives and 18 specific targets, three of which relate to the environment and sustainable development. These environment-related targets are -we ought to say- not comprehensive for the diversified characteristics of environmental issues. The evaluation indicators and benchmarks under development so far do not satisfy environmental and international cooperation experts. Poverty Reduction Strategy Papers (PRSPs) prepared by developing countries with the World Bank's

Table 1 Development Approaches after 2000

Organization	Plan	Summary
United Nations	Millennium Development Goals (MDGs) (September 2000)	Adopted at UN Millennium Summit. Eight goals and eighteen targets to be achieved by 2015. 1. Eradicate extreme poverty and hunger 2. Achieve universal primary education 3. Promote gender equality and empower women 4. Reduce child mortality 5. Improve maternal health 6. Combat HIV/AIDS, malaria, and other diseases 7. Ensure environmental sustainability Target 9: Integrate the principles of sustainable development into country policies and programmes, and reverse loss of environmental resources Target 10: Reduce by half the proportion of people without sustainable access to safe drinking water Target 11: Achieve significant improvement in lives of at least 100 million slum dwellers by 2020 8. Develop a global partnership for development
The World Bank	Poverty Reduction Strategy Paper (PRSP) - Since September 1999. 72 countries done as of July 2002.	Prepared by developing countries based on the five core principles. 1. Country-driven 2. Results-oriented 3. Comprehensive 4. Partnership-oriented 5. Based on a long-term perspective
OECD	Capacity 2015 (August 2002)	Launched from Capacity 21. Community capacity development emphasized. 1. Capacity development for communities 2. Strategies for sustainable development 3. Capacity development for multilateral environment agreements 4. Capacity development for the small island developing states 5. Strategic capacity development facility
Japan	Koizumi Initiative at WSSD (September 2002)	Human resource development for sustainable development emphasized. - "The Decade of Education for Sustainable Development" - Assistance more than 250 billion yen over the next five years for education - Environment-related human resources development for 5,000 persons in the next five years

Box 1 Important Plans for Environmental Management in Koizumi Initiative at WSSD (August 31, 2002)

■ People and Hope (Human Resources Development)

(1) "The Decade of Education for Sustainable Development"
(2) Assistance more than 250 billion yen over the next five years for education

■ Ownership and Solidarity - Development -

■ Today's Complacency, Tomorrow's Plight - Environment -

I. Environment-related Assistance for Developing Countries
(1) "Environmental Conservation Initiative for Sustainable Development (EcoISD)"
(2) Environment-related human resources development for 5,000 persons in the next five years (beginning in FY 2002)

II. Climate Change
(1) Promotion of the Kyoto Protocol
(2) Clean Development Mechanism (CDM)

III. Forest
(1) Asia Forest Partnership (AFP)

IV. Biodiversity
(1) Early ratification of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity

V. Water
(1) Safe and stable water supply and development of hygienic facilities
(2) Co-operation with NGOs and Women

VI. Environment-related Treaties
(1) Early entry into force of the Stockholm Convention on Persistent Organic Pollutants
(2) Early ratification of the Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

Source: Ministry of Foreign Affairs [2002]

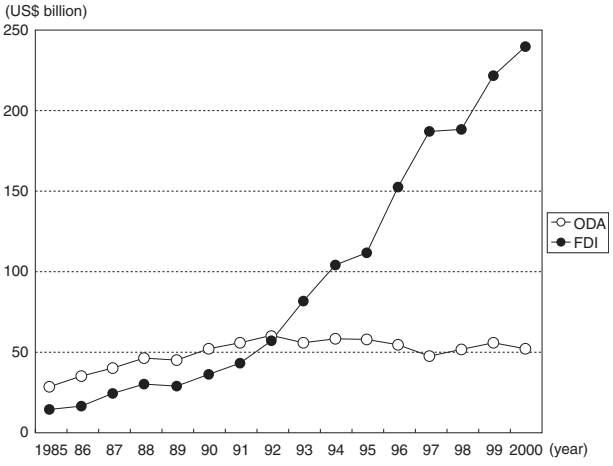
support are to be coordinated with MDGs in conjunction with overall goals among international organizations. Developed countries which individually have provided bilateral cooperation now must think how they can or should contribute to this big project or how they can make a difference in their cooperation approaches between multilateral cooperation and how they can meet the needs of developing countries as well as how bilateral donors can cooperate with each other for more effective and efficient outcomes.

The World Summit on Sustainable Development (WSSD) was held in Johannesburg, South Africa from August 26 to September 4, 2002 to summarize achievements in international cooperation till the year "Rio plus 10" and to extract some lessons for future directions. But in fact, the Summit was not as successful as UNCED in 1992 was in terms of producing a definite master plan for achieving sustainable development of the countries worldwide.

In the Summit, the Japanese government announced EcoISD (Environmental Conservation Initiatives for Sustainable Development), which had been developed from ISD in 1997 and put importance in ownership and partnership of recipient countries and capacity development in the environmental field, and adopted aid plan of educational cooperation with the amount of 250 billion yen and support for human resource development (5,000 persons) in the environmental field in the coming five years (see Box 1).

However, Japan is now facing severe financial problems and lost the position of top donor of official development assistance (ODA) in 2001. On the other hand, foreign direct investment (FDI) has increased steadily in recent decades. As Figure 1 indicates, the amount of ODA from Japan has been taken over by FDI since 1992 and, in the year 2000, the difference in the amount is as much as five times. Taking these into consideration, both Japan and counterpart countries need to rethink the role of ODA with a broader

Figure 1 Inflows of ODA and FDI to Developing Countries (2001 year price)



Sources: DAC [2001] and UNCTAD [2002]

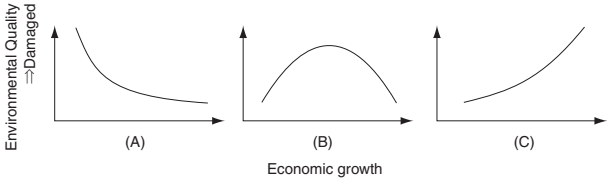
view of international cooperation and a more effective and efficient approach toward environmental cooperation which includes the contributions of the private sector and civil society.

In order to make the cooperation work more effective, one must know how societies of the recipient countries have developed in their environmental management and will develope and what kind of assistance is needed.

1.2 Economic Growth and Environmental Issues

Countries face different environmental issues upon levels of economic growth and industrialization. The World Bank [1992, pp.10-11] and Bai and Imura [2000] suggest that there are roughly three types of environ-

Figure 2 Economic Growth and Environmental Issues



(A) Poverty-related issues: access to safe drinking water and sanitation
(B) Industrial pollution-related issues: SOx,PM_{10}
(C) Consumption-related issues: municipal waster,CO_2

Sources: Bai and Imura [2000]

mental issues from the viewpoint of economic level (Figure 2). The first type is so-called poverty-related issues such as access to safe drinking water and sanitation, which are monotonically improved as the economy grows. These represent environmental and living infrastructures.

Industrialization leads a country to the second stage of the issue categorization. SOx or PM_{10} are typical in this stage. Generally speaking, we assume inverted-U curves for these issues, so-called environmental Kuznets curves (EKC) in the relations of economic growth and environmental level, while the well-known original concept by Simon Kuznets is about economic growth and income disparity. Industrialization without effective regulations and rational disciplines worsens ambient conditions in a society and the situation improves through economic growth by strict regulation implementation and social pressure due to increasing public environmental awareness, improving educational level, and so on. The concept of EKC is well recognized but there are critical discussions whether it really exists. Not a few empirical studies have tried to observe real EKC (Grossman and Krueger [1995], Panayotou [1996], Kaufman et al. [1997]). Our research team tested EKC for six major environmental issues; SOx, NOx, CO_2, access to safe drinking water and urban sanitation facilities, and deforestation (Matsuoka et al. [1998]). They applied the elasticity analysis to cross-country data at two time points (1980 and 1990) found that only SOx may have empirical EKC.

As industrial pollution is improved after reaching its peak and economic growth continues, a society faces new emerging environmental issue such as CO_2 or municipal waste management, which are consumption related issues. These problems, generally speaking, constantly worsen as economic activities and people's consumption increase.

Since environmental problems are becoming quite severe in industrializing developing countries and it is very critical to say that a country can adopt either of them or both of them without doing anything, this report focuses on how Asian countries can deal with industrialization and environmental problems.[1]

1.3 Social Environmental Management Systems in Asian Countries

Having many stakeholders involved is very important in solving social problems. The social point of view can withdraw the dynamics of the environmental problems. This report presents a new idea, Social Capacity for Environmental Management (SCEM), referring to the overall capacity of a society as a whole to deal with environmental issues and work for sustainable development. And an actor- and interrelation- oriented way of thinking leads us to a systematic analysis framework, that is, Social Environmental Management System (SEMS). SEMS has three main actors; the government, firms and citizens, and a focus should be put also on interrelations among the actors. The framework is also concerned with national and local relations in social environmental management. The concepts of SCEM and SEMS and their application are presented in Chapters Two and Three. Three development stages and evaluation indicators of SCEM are also proposed and applied in these chapters.

Based on the concept of social capacity development for environmental management, three experts from China, Thailand and Indonesia report their SEMS analysis research in their countries in Chapters Four to Six.

This topic report is based on the external evaluation on environmental cooperation focused on Japan's Environmental Center projects by the Japan Society for International Development (JASID) in the fiscal year 2002 and on the International Workshop on Social Capacity Development for Environmental Management and International Cooperation in Asia held on January 27 and 29 in Hiroshi-

ma and Tokyo (organized by the Graduate School for International Development and Cooperation, Hiroshima University).
(MATSUOKA Shunji)

Note:

1. The categorization of environmental issues and economic growth is simple and broadly accepted but note the difference in what developing countries are experiencing and what developed countries experienced. It is often said that developing countries face different types of environmental problems together, not one by one like in the history of developed countries, due to rapid economic growth and globalization of the issues.

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Chapter 2

Social Capacity Development for Environmental Management

2.1 Social Capacity for Environmental Management and Social Environmental Management System

This chapter aims to develop a framework for environmental cooperation by analyzing society's development based on the concept of Social Capacity for Environmental Management (SCEM) and Social Environmental Management System (SEMS). These concepts are developed in order to first assess the development of a country's capacity as a system for environmental management - past, present and future forecast -, and to draw a picture of an appropriate cooperation approach according to the development stage.

The next chapter takes an Environmental Center approach by the Japan International Cooperation Agency (JICA) in three Asian countries as case studies. Environmental Center projects have a pretty long history since the first case in Thailand (1990-1997). This approach usually consists of grants for buildings and facilities and technical support by Japanese experts both in a counterpart country and Japan. To date, this type of project has been implemented in Thailand, China, Indonesia, Mexico, Chile and Egypt.[1]

2.1.1 Social Capacity for Environmental Management (SCEM)

The concept of SCEM was developed from the lessons of a capacity development approach. There have been long discussions on capacity development of developing countries since the 1950s. Table 1 shows major historical developments of the cooperation approach. Institutional building in the 1950s and 1960s focused mainly on the capacity of individual entities. Since the late 1980s, the concept of capacity development has become popular among donor agencies and they are more aware of the importance of capacity development both in public and private sectors.

Capacity development also entered into environmental cooperation. The Organization for Economic Cooperation and Development (OECD) had been a keen promoter of capacity development in environment (CDE) through the 1990s as shown in Table 2. It was remarkable that they tried to develop a common concept for environmental cooperation among donor agencies but the approach has

Table 1 Historical Review of Capacity Development Approach

	Approaches	Characteristics
1950s－1960s	Institutional building	・Improving the capacity of individual organizations in the public sector
1960s－1970s	Institutional strengthening	・Improving the enforcement capacity of existing organizations
1970s	Development management	・Development plan which focuses on improvement in Basic Human Needs ・Improving the distribution capacity in the public sector ・Improving the capacity of local groups and local public sectors
1980s	Institutional development	・Strengthening relations between governmental and private sectors ・Shift to the program approach
1990s	Capacity development	・Development of long-term endogenous structure ・Linkage between political environment and organization
1995－1998	Capacity assessment and development	・Comprehensive framework to measure the institutional capacity of existing organizations ・Clear definition of system, organization, and individual capacity in the UNDP Guideline ・Project management based on results and performance

Source: Matsuoka and Honda [2002]
Original source: OECD-DAC [1999]

Table 2 History of the Concept of Capacity Development in Environment

Year	Event	Progress
1989	The Working Party on Development Assistance and Environment	Start of the argument on aid and environment
1992	The United Nations Conference on Environment and Development (UNCED) Taskforce on Capacity Development in Environment	Institutional building mentioned in Agenda 21 Established to develop a program approach of technical cooperation and analytical tools of CDE
1993	International CDE Workshop in Costa Rica	Discussed definition of "Capacity in Environment" and its basic approach
1995	*Donor Assistance to Capacity Development in Environment*	Capacity in Environment was defined as "the ability of individuals, groups, organizations and institutions in a given setting to address environmental issues as part of a range of efforts to achieve sustainable development" →・Identification of capacity and capability ・Improvement of institutional structure ・Emphasis on "process"
1999	*Donor Support for Institutional Capacity Development in Environment: Lessons Learned*	The lessons from CDE cooperation summarized ・The ambiguous definition of CDE ・The importance of CDE in rural areas ・Development of the indicator for CDE

Source: Matsuoka and Honda [2002]

not reached a concrete and practical level.

The OECD-DAC[1999] suggests several shortcomings and future tasks for CDE. One of the biggest lessons is that the concept is not clear enough to attract donor and recipient countries. They do not say clearly how general concepts of "capacity" or "capacity development" become different and unique when they are put into a set together with another concept: "environment." Also, an ambiguous concept of CDE can be as broad as "development" itself. The OECD report also emphasizes the importance of developing evaluation indicators and an evaluation monitoring system. CDE indicators are touched on later in this chapter (2.2).

Our research team has been working to develop a new framework for evaluation and implementation of international environmental cooperation based on historical development of the concepts and newly emerging approaches in the field of international cooperation such as social capital, environmental governance, etc. as shown in Table 3. That is, Social Capacity for Environmental Management (SCEM), which is defined as capacity to manage environmental problems as a whole society of the main three actors; the government, firms, and citizens.

2.1.2 Social Environmental Management System (SEMS)

Practical discussion on SCEM can start with defining Social Environmental Management System (SEMS). SEMS, as shown in Figure 1, consists of the three main actors, the government, firms and citizens. These actors themselves and interrelations among the three form SEMS. Relations between the national level and local level are also of much importance in the framework since actual problems occur at local level and local firms and citizens have most things to do with the solutions while overall environmental policies and laws are established at the national level. SEMS, therefore, basically consists of the three actors, two levels and in-between interactions.

Figure 2 shows causes and effects of environmental quality and socio-economic situations toward SEMS. SEMS in one country is prescribed by the socio-economic conditions and it appears as the level of environmental quality. Here also are the inter-prescribing relations between environmental quality and so-

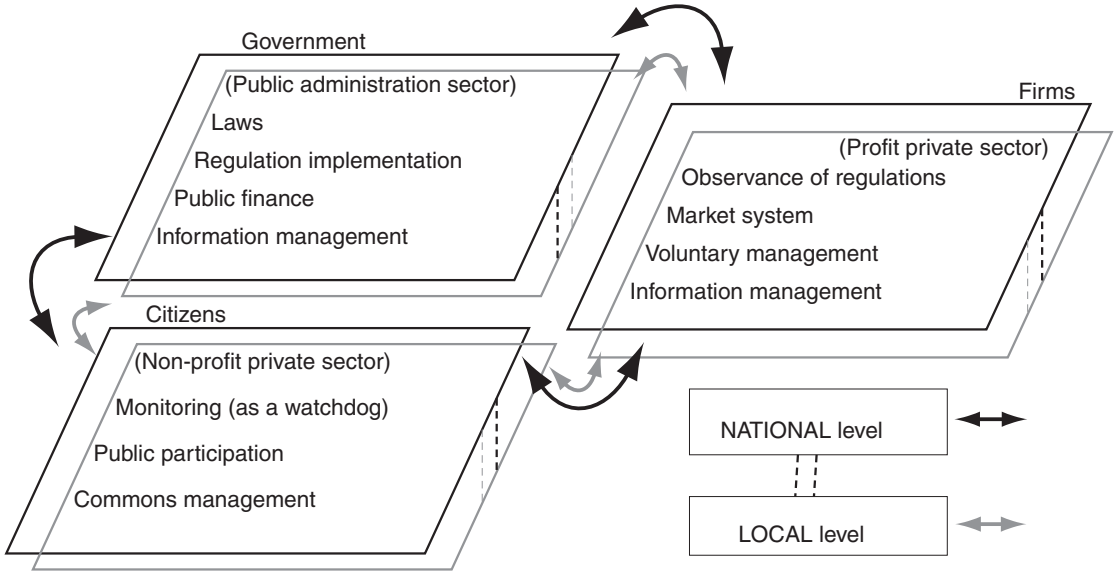
Table 3 The Trend of Cooperation Approach

Social capital Coleman 1988, Putnam 1993. Used in cooperation field since the late 1990s.	
OECD (2001)	Definition: Networks together with shared norms, values and understandings that facilitate co-operation within or among groups
World Bank (2002)	Definition: The institutions, relationships, and norms that shape the quality and quantity of a society's social interactions.
Environmental management system Since 1975. Improved after Rio Summit (UNCED, 1992)	
UNEP & WHO	At the GEMS (Global Environmental Monitoring System) project, urban environmental management system was valued using the following indicators (ex. Air quality). ・Measure air quality ・Assess and make available data ・Estimate emissions ・Enable management
Environmental governance Taskforces in various organizations established after UNCED	
OECD (2002)	Mentioned the importance of the roles in government to achieve the sustainable development governance. Mentioned the importance at the following points. ・Horizontal (inter-ministry) and vertical (national level-rural level) integration ・Improvement of consciousness ・Participant of citizens and firms
World Bank	The Environmental Governance component of the program focuses on building faith in the rule of law by strengthening institutional capacity for ensuring compliance with environmental laws and standards. The strategic objective of the program is to strengthen environmental governance in World Bank client countries by: ・Strengthen good governance practices, including country capacity for effective compliance with and enforcement of environmental laws and regulations ・Strengthen the role of parliamentarians in implementing environmental decisions in their legislatures ・Build global and regional networks for environmental compliance and enforcement and support existing networks ・Enhance understanding of multilateral environmental agreements, interactions with the World Trade Organization (WTO), and international rulemaking ・Promote an informed dialogue among all concerned parties, including civil society, on the participation and empowerment of the poor and women in environmental decision-making processes
ESCAP (2002)	Pointed out the importance of public policy (governance). Components of environmental governance are: ・To establish wide objectives ・To plan concrete targets ・To make policies to achieve the concrete targets ・To chose the concrete policy method ・To built institutional mechanisms to operate the policy ・To incorporate the participation mechanism and power-grabbing of stakeholders ・To make clear the rights and obligations of stakeholders
IGES (2001)	Analysed what kind of environmental issues society deal with, from the point of view of the correlation between instituions (formal and informal) and actors (formal and informal). Through analysis of the environmental governance in Asian countries, the following points were proposed. ・To establish the environmental policy information network in the Asian region ・To reconsider the existing laws, policies, organizations comprehensively to improve the policy frame ・To encourage decentralization about the decision and operation of environmental policy ・To make the frame that citizens (as environmental NGOs) can participate in the process of planning and operating of area projects ・To operate the environmental impact assessment (EIA), and considering the acceptability of strategic environmental assessment (SEA) ・Special considerations for those medium and small firms and factories can comply with the environmental regulations

Source: The author

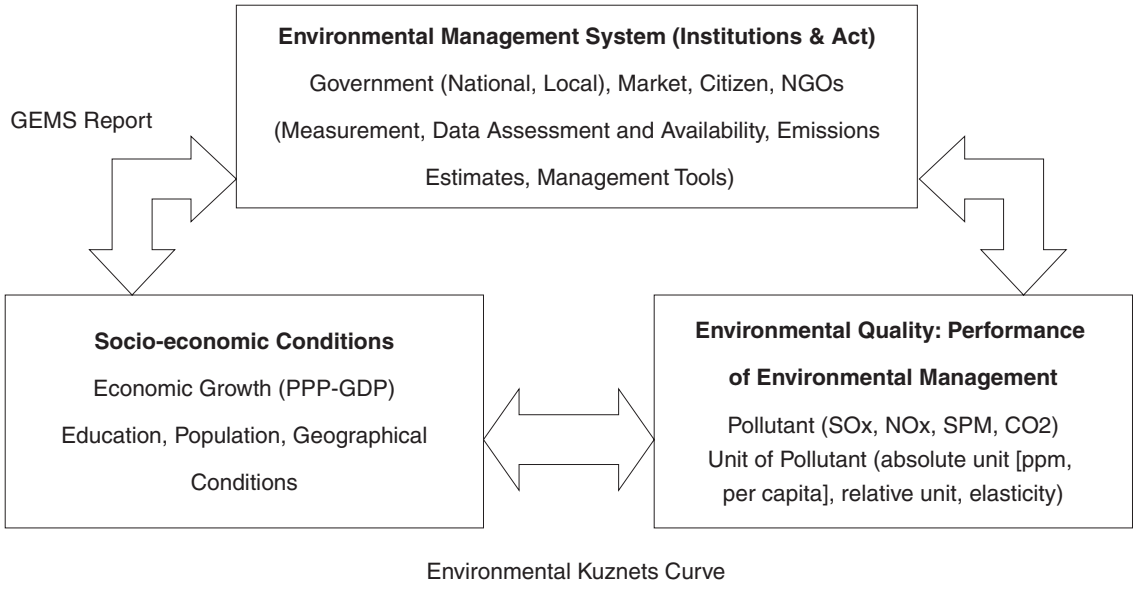
cio-economic conditions. Japan has a good example for this concept, that is, the Kitakyushu case during the 1960's and 1970's in which the city had serious industrial pollution. As Figure 3 shows, in the Kitakyushu model, not only the three actors of the city government, firms and factories, and citizens each made efforts on their own but also strong cooperation worked between the local government and firms , and citizens by coordinating li-

Figure 1 Social Environmental Management System (SEMS)



Source: Matsuoka [2002]

Figure 2 SEMS and its Interrelations with Environmental Quality and Socio-economic Conditions

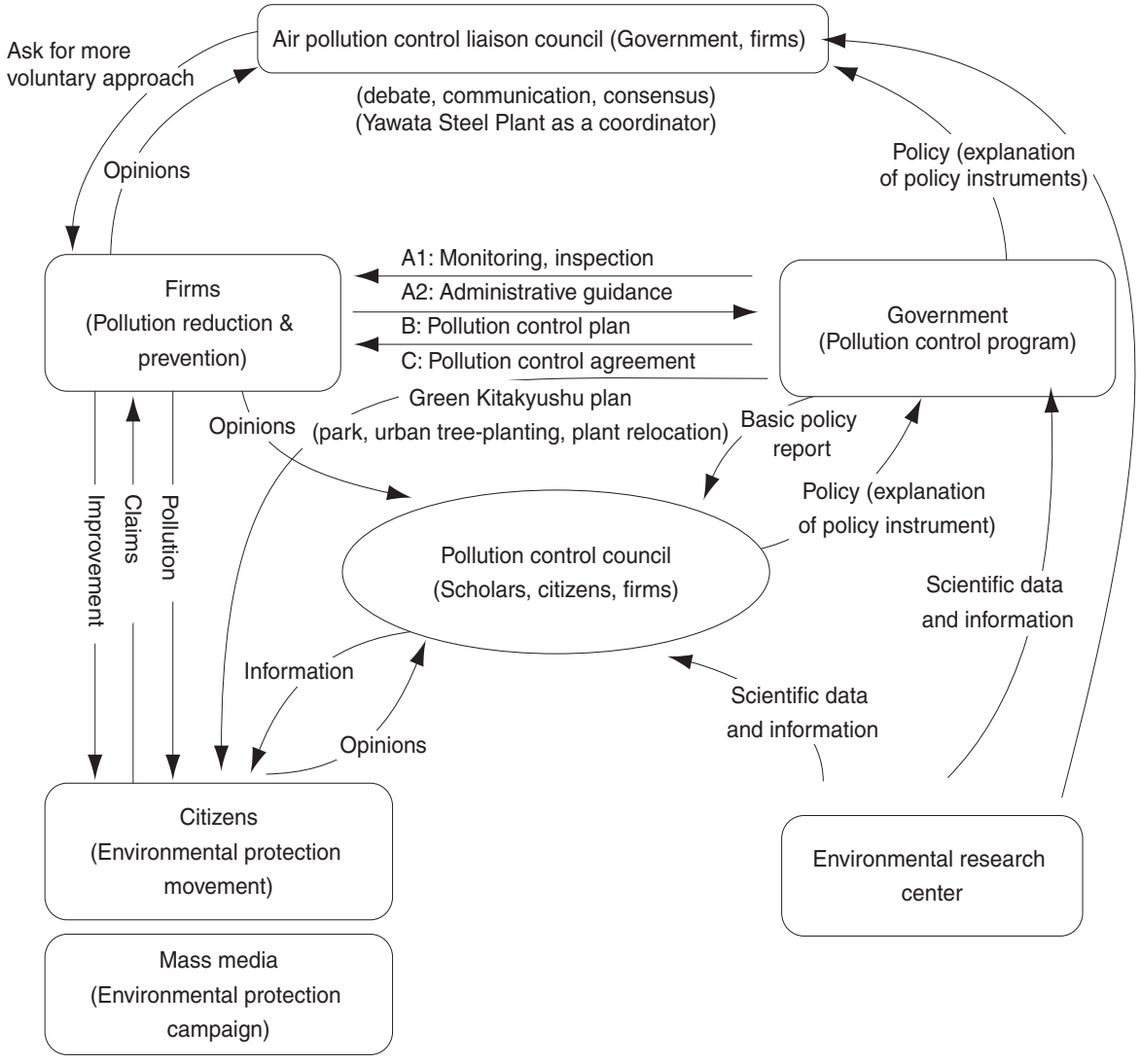


Source: Matsuoka et al. [2000]

aison committees. This indicates the importance of bodies that enhance and coordinate interactions among actors as well as the actors themselves.

SEMS can be explained by comparative institutional analysis and new institutional economics. Figure 4 describes some concepts of comparative institutional analysis and their application to SEMS analysis. Comparative institutional analysis describes the institution as a self-sustaining system of shared beliefs about a salient way in which the game is repeatedly played [Aoki 2001, 10]. From this viewpoint, institutions are durable and robust.

Figure 3 Kitakyushu Model



Source: Katsuhara [2000]

Institutions are more than just individual entities . A bundle of institutions form a social system through their characteristics of hierarchy and complementarity. In this context, individual players tend to choose their strategies based on an existing and related social system (strategic complementarity). Moreover, institutions depend on the origin or historical path of development, and this differentiates one system from another due to the different paths (path dependency). This study analyzes the development of SEMS in Asian countries and discusses the direction of Japan's effective international cooperation.

2.2 Development of SCEM

This section tries to give answers and ideas to the following questions.

- How does SCEM develop?
- How can the development process be analyzed?
- What are the essential benchmarks in the development of SCEM?
- What kind of indicators are needed for the analysis?

Figure 4 Concepts of Comparative Institutional Analysis and their Application to SEMS

Definitions of institution from the viewpoint of game theory

Player = Institution	Nelson (1994)	An institution is an organization itself.
Player ≠ Rule, Institution = Rule	North (1990)	Institutions are the game in a society or more formally, are the humandevised constraints that shape human interaction.
Player (play) = Institution	Aoki (2001)	An institution is a self-sustaining system of shared beliefs about how the game is played.

The point of view from institutional analysis

A bundle of institutions → complementarity	"A bundle of institutions" can be defined as a system.
Institutional complementarity	Institutions have hierarchy,and institutions work systematically and strongly when institutions complement each other.
Strategic complementarity	Even though substitutable action choices are available to individual agents, their actual choices may be affected by the prevailing strategy profiles in the domains in which they are active (Choice interdependencies).
Path dependance	Once an institutional bifurcation occurs, even if two different (historically, economically) economies are exposed to the same technological and market environment afterwards, the subsequent overall institutional arrangements of the two economies may well differ, depending on their respective interim institutional trajectories.

Application on the analysis of SEMS in developing countries and international cooperation

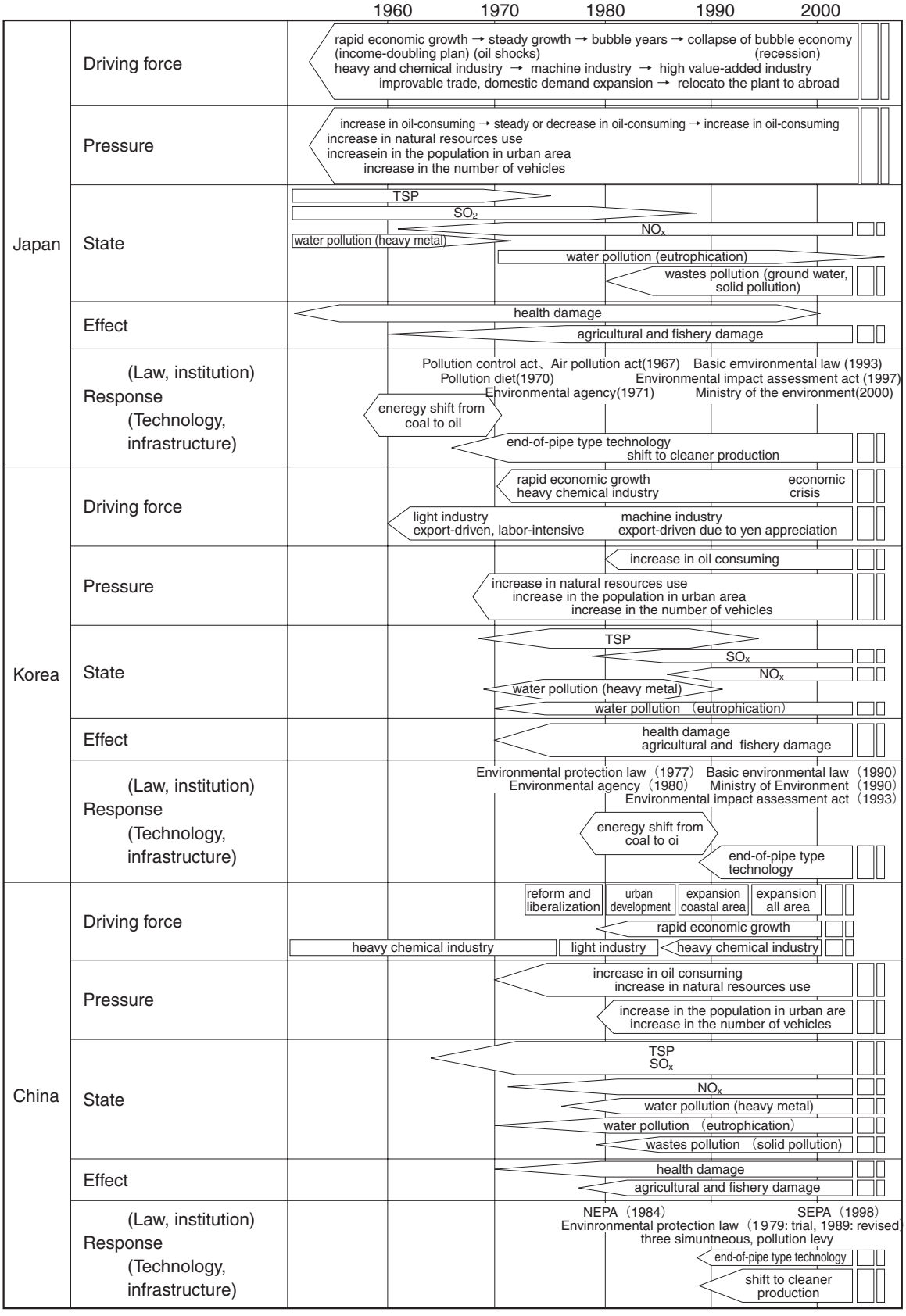
① Dynamics of institutional change, and the development stages of SCEM
② Transfer of Japan's experiences
③ Development of the international cooperation system

Source: Matsuoka and Honda [2002], Aoki [2001], Aoki and Okuno [1996]

2.2.1 Benchmarks and Stages of the Development of SCEM

Harashima and Morita [1998] analyze development periods of environmental policy or environmental management in Japan, Korea and China. They assume the three periods, namely, initial period, progressive period, and consolidation period. The main conclusions are that (1) environmental policy is more mature in the order of Japan, Korea, and China, (2) China has not yet reached the final period: the consolidation period, (3) the development periods are more condensed in

Figure 5 Comparative Analysis Using DPSER Framework



Source: Imura and Kobayashi [1999]

Table 4 Development Stages and Benchmarks of Social Environmental Management System (SEMS)

	System-making stage	System-working stage	Self-management stage
Definition	Fundamental bases of SEMS, especially governmental institutions, are developed	Relations between government and firm sectors become stronger through setting the incentives for pollution abatement and industrial pollution improves after reaching its peak.	a comprehensive environmentalpolicy is needed since new types of environmental issues come out, and firms and citizens sectors take leading roles in voluntary approaches for environmental management. Harmonious relationsamong government, firms and citizens accelerate efficient social environmental management.
Related environmental issues	Poverty related issues, industrial pollution related issues	Industrial pollution related issues	Consumption-related issues
Industrial pollution related issues	Degradation	Turning point (peak of environmental Kuznets curve)	Improvement
The role of three actors	・Government (system making) ・Firms (efforts for pollution reduction) ・Citizens (pressure to the government and firms, research cooperation)	・Government (pollution control regulation) ・Firms (pollution reduction) ・Citizens (pressure to the government and firms, research cooperation)	・Government (comprehensive environmental policy) ・Firms (voluntary approach) ・Citizens (voluntary approach)
The relationship among three actors	・Government－Firms ・Government－Citizens	・Government－Firms ・Government－Citizens ・Firms－Citizens (through government)	・Firms－Citizens ・Government－Firms ・Government－Citizens
Benchmarks (essential)	・Environmental law ・Environmental administration ・Environmental information (monitoring data)	・Regulation ・Reach the peak of pollution level and improve	<First phase> (In the case of developing countries) ・Graduation / independence from ODA <Second phase> ・Comprehensive environmental management
Benchmarks (important)	・Negotiation between Government-Firms, Government-Citizens ・Mass media	・Negotiation, adjustment, and cooperation between Firms-Citizens	Voluntary approach of Firms and Citizens (environmental accounting, environmental report, green consumption, advocacy planning, etc.)

Source: The author

the case of latecomers.

OECD's DPSIR (*driving force, pressure, state, impact, response*) model (sometimes *effect* is used instead of impact.) tries to analyze the process of environmental issues from causes of the issues, impact on society, and behaviors to deal with the issues. Figure 5 shows the cases of Japan, Korea and China by Imura and Kobayashi [1999, 106-108], from which the reader can see differences in the process of the three countries, especially Japan and the other two. Japan experienced and overcame the problems one by one in its long history since the toxic water problem in Ashio in the 1880s. In developing countries like China and Korea, on the other hand, environmental problems, or at least their awareness, are rather new to them and they are condensed in a shorter period. The same trend is observed also in Harashima and Morita [1998] regarding environmental policy actions, which we can call a response in the model, in the three countries.

As mentioned in Chapter 1, from the standpoint of environmental issues themselves, a general understanding is that with economic growth, the major issues shift from (1) poverty-related issues such as access to safe water and public health, and (2) industrial pollution such as SOx from power plants and factories, to (3) consumption- related issues such as CO_2 due to consumption expansion (Bai and Imura [2000]). SCEM in this study focuses on so-called brown issues, especially industrial pollution such as SOx in the air, especially SOx. This study assumes three development stages of SEMS: system-making stage, system-working stage, and self-management stage. Table 4 indicates the stages and benchmarks of SEMS.

The system-making stage is that in which the fundamental functions of SEMS are developed. Since this stage especially needs capacity development in the government sector, the benchmarks should be environmental law (basic law and acts for specific pollution controls), environmental administration, and environmental information. In these benchmarks, environmental law is usually established first. The last benchmark is usually the establishment of the environmental quality monitoring network and information disclosure to the public. Moreover, it is important how the data and information is analyzed and helps policy-making. Therefore, this study selects the issue of state of the environment as one of the important indicators. The World Resources Institute (WRI) [2002] also considers this indicator as evolution of environmental information. Weidner and Janicke [2002] survey the starting years of environmental administration, state of the environment, environmental law and so on for 30 countries (Table 5).

In the system-working stage, the system starts actually working to improve the environmental quality. A turning point of the so-called environmental Kuznets curve should be observed in the middle of the stage. In this analysis, the focus is on the reduction in SOx emissions. After the turning point of EKC, the SEMS starts shifting toward the self-management stage.

The self-management stage is the stage in which the system develops sustainably through strong interrelations among the government, firms and citizens, and comprehensive environmental policy is enforced. Firms and citizens take initiatives in environmental management by their voluntary efforts. In terms of international cooperation, a developing country becomes more independent from donor's assistance and utilizes its own financial and human resources in this stage as a sign of its initial period.

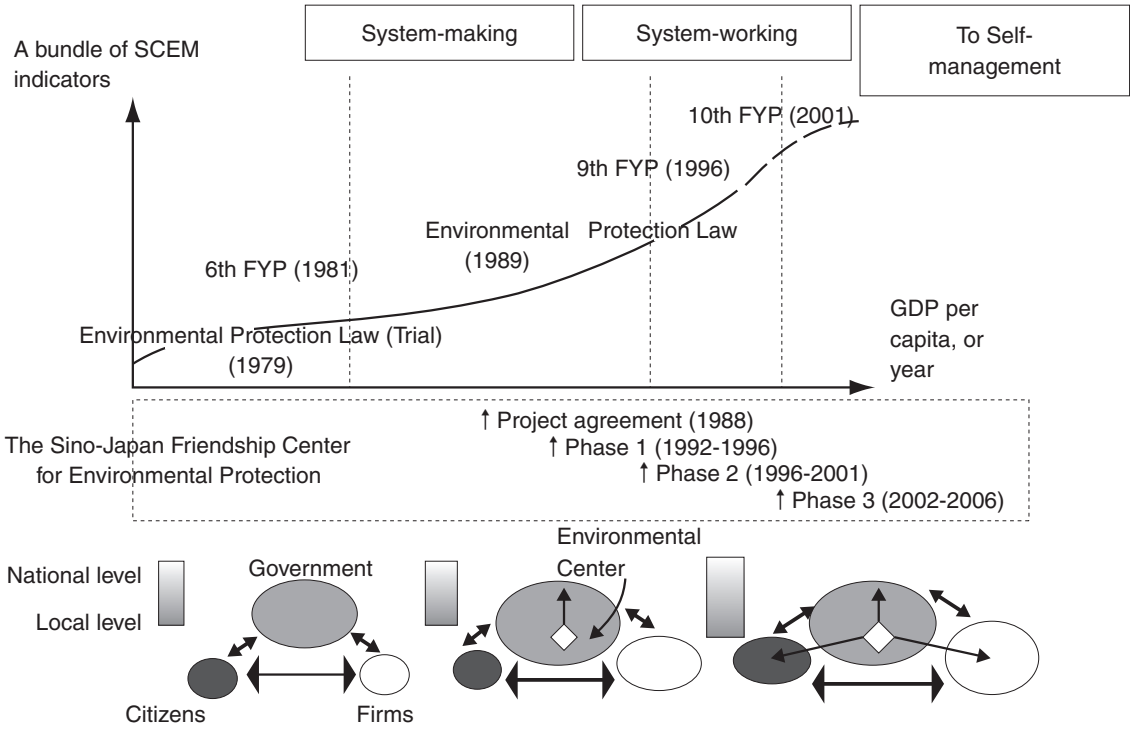
Roles and relations of the three actors also change as a country experiences the development of SEMS. The government sector plays an important role to manage and coordinate issues in the system-making and system-working stages but in the self-management stage, it is responsible for supporting firms and citizens by making a framework for comprehensive environmental management.

Table 5 Institutionalization in Environmental Policy

Countries	Ministry of the Environment	National Environmental Agency	National Environmental Report	Environmental Framework Law	Article in the Constitution	Council of Environmental Experts	National Environmental Plan
Australia	1971/1975	1988	1980/1996	1974			1992
Austria	1972	1985	1978		1984	1971	1995
Brazil	1985/1992	1989		(1981)	1988	1984/1997	2001
Bulgaria	1990	1976	1989	1991	1968/1991	1974/1996	1988/1992
Canada	1971		1986	1988		1971	1990
Chile		1990/1994	1992	1994	1980	(1996)	1998
China		1984	1989	1979/1989		1991	1994
Costa Rica	1986	1995	1986	1995	1994	1995	1990/1996
Czech Republic	1989	1991	1990	1992	1992	1992	1992
Denmark	1971	1971	1983	1973/1991			1994
France	1971/1984	1991	1973	2001		1975	1990
Germany	1986	1974	1976		1994	1971	
UK	1970	1972/1995	1978	1974/1990		1970	1990
Hungary	1987	1974	1975	1976/1995	1972/1990	1996	1992
India	1980/1985	(1974)	1982	1986	1976/1994	1993	1993
Italy	1971/1986	(1994)	1989	1986	(1948)	(1986)	(1997)
Japan	2001	(1971)	1969	1967/1993		1967	1995
Korea	1990/1994	1977	1991	1990	1980/1987	1985	1987/1990
Mexico	1982/1994	1992	1986	1972/1988	1988	1995	1989
Morocco	(1995)					(1995)	
Netherlands	1971/1982	1984	1973	1979/1993	1983	1974	1989
New Zealand	1972/1986		1997	1986/1991		1970-88	1994
Nigeria		1988	1992	1988	(1979/1989)	1990	1988/1990
Poland	1972	1980/1991	1972	1980/2001	1976/1989/1997	1993	1992
Sweden	1986	1967	1977	1969/1998	1974	1968	1993/1998
Switzerland	(1999)	1971	1990	(1983)	1971/1999		(1997)
Taiwan		1978	1988/1993		1992	(1987)	1979/1994
USA		1970	1970	1969		1971	
USSR/Russia	1988		1988	1991	1977/1993		1993
Vietnam	1992	1993	(1995)	1994			1991

Note: Years in parentheses indicate institutions coming close to the conventional definition.
Source: Weidner and Janicke [2002]

Figure 6 The Development Process of SCEM in China



Source: Matsuoka [2002]

Figure 6 shows the evaluation image of SCEM with the stages and benchmarks mentioned above (China's case). This figure also indicates the history of the Sino-Japan Friendship Center for Environmental Protection which has been supported by the Japan International Cooperation Agency (JICA) since 1992 to the present.

2.2.2 SCEM Indicators

Developing indicators of SCEM starts with reviewing the existing environmental and social indicators and challenges the integration of these two. The most basic and objective indicators about environmental issues are the environmental quality data of the pollutants. We can see the trend of environmental quality in one city or country from the observation of time-series data. There are many information sources like the OECD's *Environmental Indicators* and *World Resources* by WRI. The OECD's Environmental Indicators also tries to provide a set of socio-economic indicators together with environmental indicators.

The most popular socio-economic index is the Human Development Index (HDI) by UNDP. The Human Development Report which presents HDIs for some 150 countries has been published every year since 1990. As shown in Table 6, HDI is calculated from average life expectancy, education level, and income level and scored by the balance of the highest and lowest countries [UNDP 1990]. HDI has received a lot of pros and cons and the Report often provides a supplemental index such as Gender Index and different poverty indices for developed and developing countries. HDI, however, does not function as a standard for one country being or not being an ODA recipient nor give us concrete ideas on how donor agencies should assist a particular country.

The United Nations Commission for Sustainable Development (UNCSD), OECD,

Table 6 Social Index

Target	Index	Dimension	Indicator
Human development 1990-	Human development index (HDI)	A long healthy life	Life expectancy at birth
		Knowledge	Adult literacy rate
			Gross enrollment ratio (GER)
		A decent standard of living	GDP per capita (PPP US$)
Poverty 1997-	Human poverty index for developing countries (HPI-1)	A long healthy life	Probability at birth of not surviving to age 40
		Knowledge	Adult literacy rate
		A decent standard of living	Percentage of population not using improved water sources
			Percentage of children under five who are under weight
	Human poverty index for OECD countries (HPI-2)	A long healthy life	Probability at birth of not surviving to age 60
		Knowledge	Percentage of adults lacking functional literacy skills
		A decent standard of living	Percentage of people living below the poverty line
		Social exclusion	Long-term unemployment rate
Gender 1995-	Gender-related development index (GDI)	A long healthy life	Female life expectancy at birth
			Male life expectancy at birth
		Knowledge	Female adult literacy rate
			Female GER
			Male life expectancy at birth
			Male GER
		A decent standard of living	Female estimated earned income
			Male estimated earned income
	Gender empowerment measure (GEM)	Political participation and decision-making	Female and male shares of parliamentary seats
		Economic participation and decision-making	Female and male shares of positions as legislators, senior officials and managers
			Female and male shares of professional and technical positions
		Power over economic resources	Female and male estimated earned income

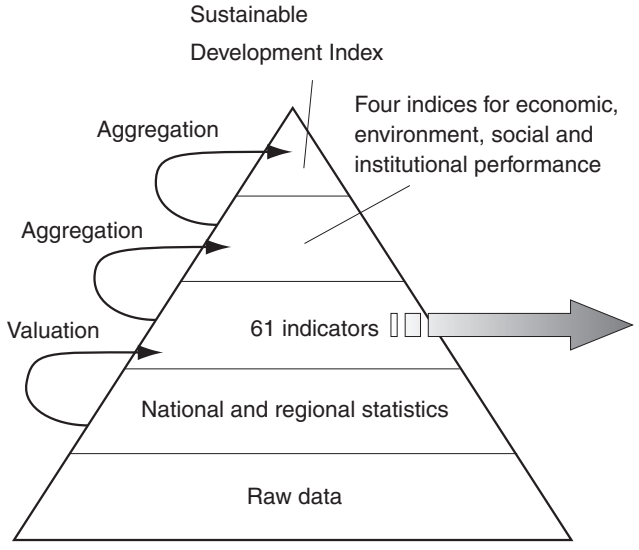
Source: UNDP [2002]

and Global Leaders of Tomorrow Environment Taskforce of World Economic Forum are trying to evolve environmental indicators together with socio-economic indicators in order to obtain an index of sustainable development; Sustainability Indicators, Environmental Indicators, Environmental Sustainability Index (ESI) respectively [UN 2001, OECD 2001, World Economic Forum 2002].

One more example is *Dashboard* by the International Institute for Sustainable Development (IISD). As shown in Figure 7, *Dashboard* consists of four categories of society, environment, economy and institutions and category index is calculated from 8 to 20 individual indicators in each [IISD 2002]. According to the Policy Performance Index (PPI) by the European Environmental Agency which is developed in a similar concept, weighting the category indices should be different from one country to another depending on the priority setting by environmental experts and citizens. The OECD selects several principal criteria from 50 environmental indicators to make it easy to handle them in the evaluation and is trying to integrate environmental and socio-economic indicators by DPSER (DPSIR) model [OECD 2001].

Some attempts are being made in developing indicators for Capacity Development in Environment (CDE). At the International Workshop on Danish Assistance to Capacity

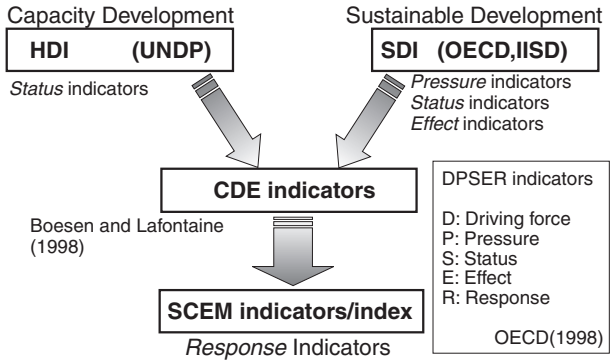
Figure 7 Aggregation between Environmental Indicators and Social Indicators (IISD-Dashhboad)



Social(30)	Environmental (20)	Economic (34)	Institutional (8)
Poverty	CO2	GNP	SD strategy
Equity	Other GHG	GDFI	SD membership
Unemployment	CFCs	CAB	Internet
F/M wages	Urban air	Extemal debt	Telephones
Child weight	Crop land	ODA	R & Dexpenditure
Child mortality	Fertilizer	Materials	Disasters, human cost
Life expectancy	Pesticides	Energy use	Disasters, economic damage
Sanitation	Forest area	Renewable energy	SD indicator coverage
Safe water	Wood harvesting	Energy efficiency	
Health care	Deserts & arid land	Municipal waste	
Child immunization	Squatters	Hazardous waste	
Contraception	Phosphorus	Nuclear waste	
Primary school	Coastal population	Recycling	
Secondary school	Aqua culture	Car use	
Miteracy	Wateruse		
Crowding	BOD		
Crime	Faecal coliform		
Population growth	Key eco system		
Urbenization	Mammals & birds		
	Protected area		

Source: IISD website

Figure 8 Development of Indicators / Index for SCEM



Development in Environment (Snekkersten in May 1998), Boesen and Lafontaine [1998] proposed a matrix of five management functions and three levels of actors[2] in CDE and 80 indicators categorized in results and management process.

Figure 8 summarizes the development of conventional indicators to SCEM indicators. The human development index and sustainable development index are developed in the context of capacity development and sustainable development, respectively, and the CDE indicators can be positioned as an attempt to integrate these two. The SCEM indicators are proposed in clearly expected functions of the actors, all of which are involved in both economy and environment and also in both positive and negative sides of environmental management.

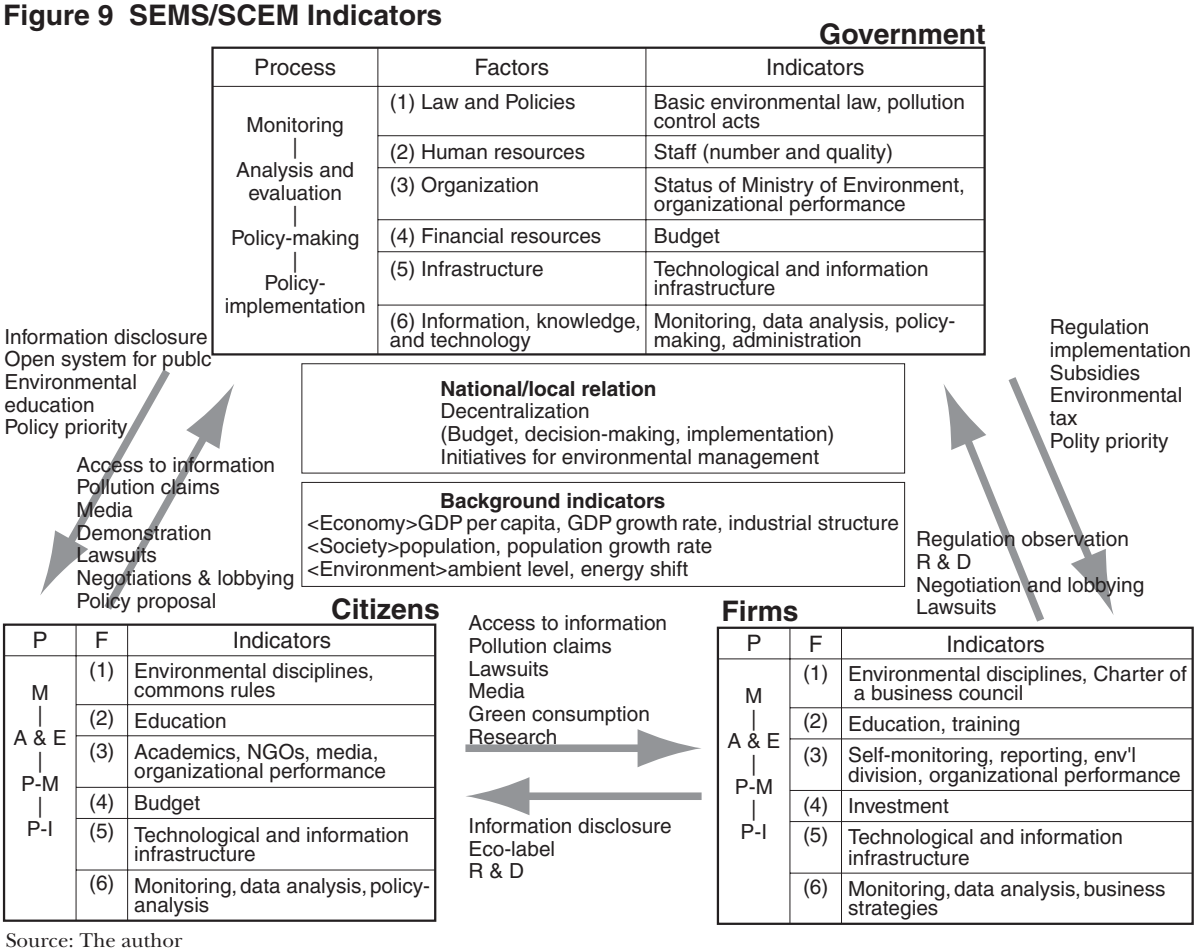
Indicators of Social Capacity for Environmental Management (SCEM) are shown in Figure 9. Indicators are based on four processes (monitoring, analysis and evaluation, policy-making, and policy implementation) and six factors (law and policy, human resources, organizations, financial resources, infrastructure, and information, knowledge and technology) in each actor. Inter-actor relations have indicators of behaviors and effects of the two actors. Relations of national and local levels are evaluated through the decentralization process. Furthermore, SCEM indicators include socio-economic indicators and environmental quality indicators as background information. This report discusses the development of SCEM based on selected important indicators for the stages.

(Shunji MATSUOKA)

Notes:

1. The projects in China and Indonesia are ongoing and

Figure 9 SEMS/SCEM Indicators



Source: The author

some short- and long-term experts are dispatched to other projects except in Thailand's case.

2. Functions: information management and awareness raising, policy making and planning, establishment and maintenance of institutional framework, implementation and enforcement, and mobilization of resources. Actors: national level (donors, government, ministries, agencies, NGOs, private sector, etc.), intermediate level (district and municipality government, river basin authority, NGOs, associations, etc.), and community level (village and ward government, community organization, leaders, groups, households/families, voluntary agencies, businessmen, etc.) (Boesen and Lafontaine [1998]).

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Chapter 3

Evaluating Social Capacity Development for Environmental Management in Developing Countries: Case Studies

3.1 Development Process of SCEM in Three Asian Countries

This chapter applies the analysis framework of Social Capacity for Environmental Management (SCEM) in the selected Asian countries of China, Thailand and Indonesia which have Environmental Centers supported by JICA, and evaluates their current stage and what kind of support can be provided for further development. Regarding environmental cooperation for industrial pollution control such as an Environmental Center approach, we set the following hypothesis, that the best timing for project input, or the best entry point of project is the final phase of the system-making stage. This is because Environmental Centers which are basically aimed at contributing to environmental policy-making and implementation need the fundamental functions of the system being developed enough to be able to utilize the center. And the project's exit point should be around the peak of the industrial pollutions such as SOx, that is, the turning point of the environmental Kuznets curve since this is a sign that the system-working stage is actually developing and a country is obtaining enough capacity to manage industrial pollutions by themselves. Information and data have been taken from various sources as shown in Table 1.

3.2 China

Table 2 shows the historical development of environmental policy in China. It also indicates the implementation process of the Sino-Japan Friendship Center for Environmental Protection. The First National Conference on Environmental Protection was held in 1973 and the next year, the Environmental Protection Leadership Group was established in the State Council. It can be said that China's Social Environmental Management System (SEMS) started its formation in this period gradually and the Environmental Protection Law (trial version) in 1979 and Environmental Protection Law (final version) were enacted in the initial phase of the system-making stage in 1989. Several previous

Table 1 Data Source

	China	Thailand	Indonesia
History of environmental policy	Harashima and Morita (1995) China Environmental Protection website International Energy Agency	ADB (2001) Nicro and Apikul (1999) O'Conner (1994)	BAPEDAL website World Bank (2002) CIA website
Environmental law	JICA (1999)	Ogano (1994) Hag et al. (2002) JICA (1997)	Global environmental forum (1999)
Environmental administration	SEPA website	JICA (1997) MONRE website	JICA (2000)
Monitoring data	China Environment Yearbook	DOE, MOSTE PCD (1996)	World Bank (1997) OECC (2001)
Environmental data (SOx)	China Environment Yearbook	Streets et al. (2000)	Streets et al. (2000)
Environmental data (PM_{10}, TSP)	Li (1999)	BMA (2000)	World Bank (1997)

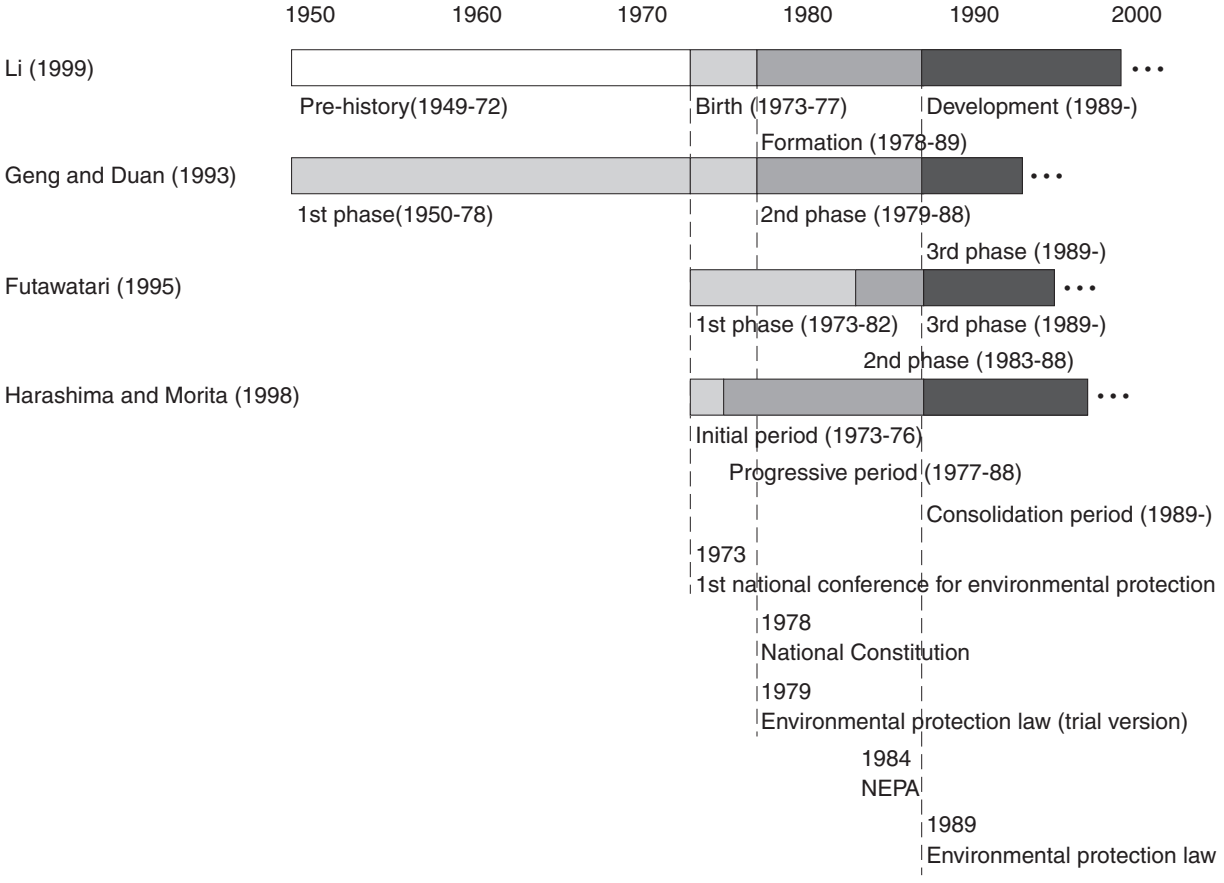
Source: The author

Table 2 Chronological Summary of Environmental Policy and the Environmental Center in China

Year	Environmental law	Administration	National development plan	GDP/Capita PPP (USD)	Environmental Center (Japan-China Friendship Center for Environmental Protection)
1966			The Third Five Year Plan (3FYP)(1966-70)		
1971			4FYP (1971-75)	569	
1973	1st national conference for environmental protection				
1974		Environmental Protection Leading Group of the National Council			
1975				636	
1976			5FYP (1976-80)		
1979	Environmental protection law (trial version)				
1981			6FYP (1981-85)	808	
1982	Air quality standard				
1983	2nd national conference for environmental protection Aggregated regulation industrial pollution control and technical evolution				
1984	Water pollution control law	Environmental protection commission in State Council			
1985	Partly decontrolling energy prices			1,204	
1986			7FYP (1986-90)	1,287	
1987	Air pollution control law				
1988	China water law	National Environmental Protection Administration (NEPA)			Request for the project
1989	Environmental protection law 3rd national conference for environmental protection				
1990				1,612	
1991	Operational rules of air pollution control		8FYP (1991-95)	1,736	
	Water and solid protection law				
1992					Phase 1 start
1995	Waste pollution control law Air pollution control law (revised)			2,686	Phase 1 finish
1996	Water pollution control law (revised) 4th national conference for environmental protection		9FYP (1996-00)	2,917	Phase 2 start Environmental center open
1998		State Environmental Protection Administration (SEPA)			
2000	Air pollution control law (amended)				
2001	China sand erosion control law		10FYP (2001-05)		Phase 2 finish Follow-up phase start
2002					Phase 2 (FU) finish Phase 3 start (-2006)

Source: Harashima and Morita [1995], China environmental protection website, International Energy Agency

Figure 1 Environmental Policy Development in China



Sources: Li [1999], Geng and Duan [1993], Futawatari [1995], Harashima and Morita [1998]

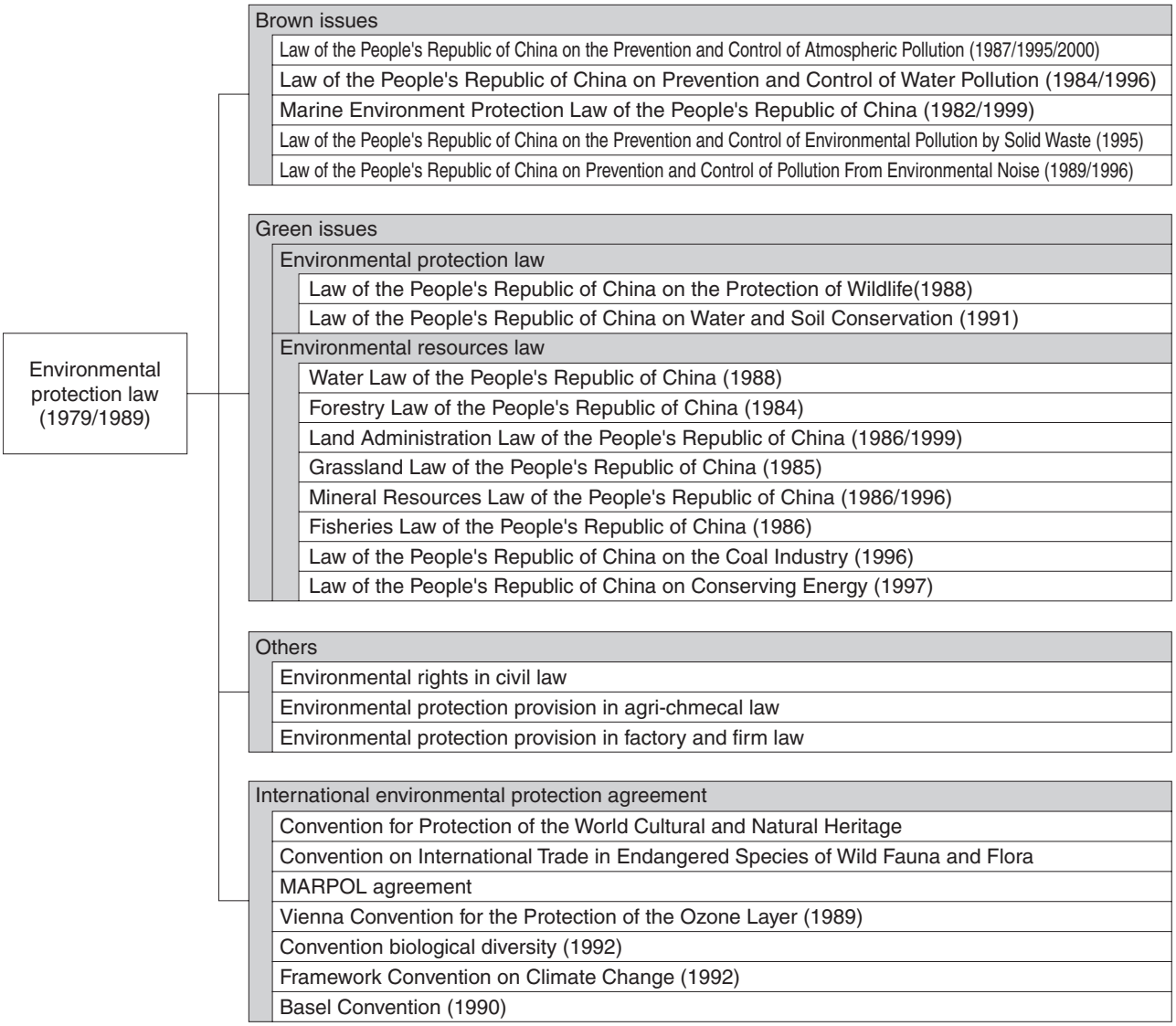
studies also indicate these events as epoch-making as Figure 1 shows (Li [1999], Geng and Duan [1993], Futawatari [1995], Harashima and Morita [1998]).

Environmental law and environmental administration had developed well by the mid-1990s and also, the China Environment Yearbook, which has been issued since 1990, upgraded its quality since the 1994 issue. Figures 2 and 3 show the environmental law system and environmental administration system in China. From this evidence, a tentative conclusion is that China accomplished its system-making in the mid 1990s and entered its system-making stage by enforcing Air Pollution Control Act Amendments (1995) and the Ninth Five Year Plan (1996-2000). The Tenth Five Year Plan (2001-2006) has just started.

Table 3 shows the number of air pollution monitoring stations in the three countries. China has very large number of stations all over the nation, compared with the other two. The Environmental Center project will have an automatic nationwide environmental information network of a hundred cities and will be in operation soon. Figure 4 indicates that SO_2 emissions in China reached its peak in 1996 and are decreasing.[1] On the other hand, Total Suspended Particulates (TSP) also shows a decline but are far over the standard (300 $\mu g/m^3$ in the second graded cities) (Figure 5)[2].

The information above implies that China is now gradually shifting to the self-management stage. But several serious brown and green environmental problems such as TSP concentration, NOx emissions, municipal waste management, yellow sand (bai), desertification and biodiversity should seriously be taken into account. SEMS, which consists of

Figure 2 Environmental Law System in China



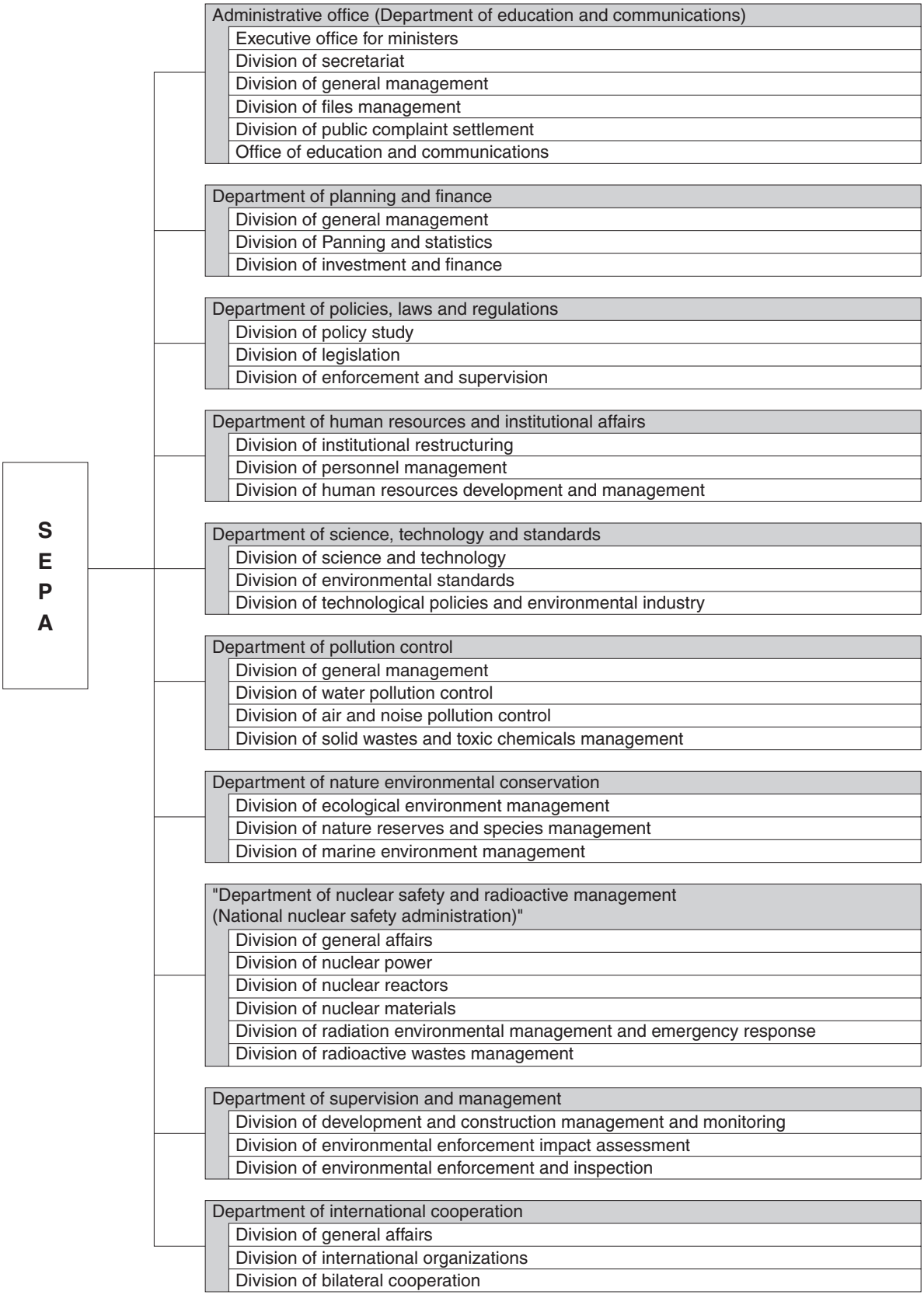
Source: JICA [1999]

the government, firms and citizens, needs to be strengthened especially in the sectors of firms and citizens and also in the interrelations among the three actors. Also, developing social environmental management at the local level is crucial for the whole SEMS especially in the context of the undergoing development plan of the western region. Comprehensive and nationwide plans for the development of SEMS are important for China.

3.3 Thailand

Table 4 shows a chronological summary of Thailand's environmental policy and the Environmental Center (Environmental Research and Training Center; ERTC) project. The National Environmental Quality Act (NEQA) was enacted and the National Environmental Board and Office of National Environmental Board (ONEB) were established in 1975. See Figure 6 for Thailand's environmental law system. From this evidence, the year 1975 can be considered as the start of

Figure 3 Environmental Administration in China (State Environmental Protection Administration; SEPA)



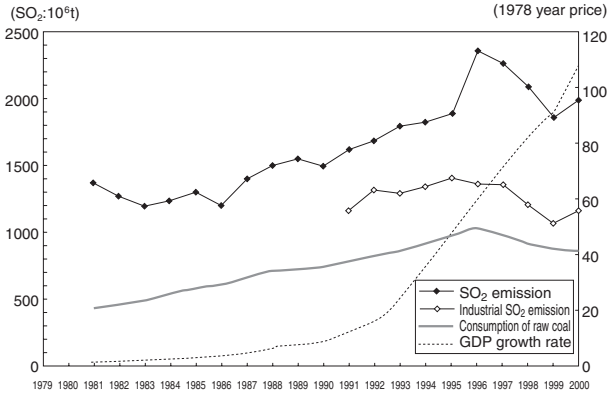
Source: SEPA website

Table 3 The Number of Air Monitoring Stations

Year	China	Thailand	Indonesia
1976			1
1977		3	1
1978		4	1
1979		4	3
1980		4	8
1981		4	9
1982		4	9
1983		12	17
1984		12	17
1985		12	17
1986		12	16
1987		17	16
1988		17	11
1989		17	11
1990		17	11
1991		21	17
1992		21	20
1993	2,179	21	23
1994	2,222	21	23
1995	2,155	51	23
1996	2,155	51	23
1997	2,196	51	26
1998	1,926	51	26
1999	2,203	52	n.a.
2000	2,552		50
2001	2,229		59

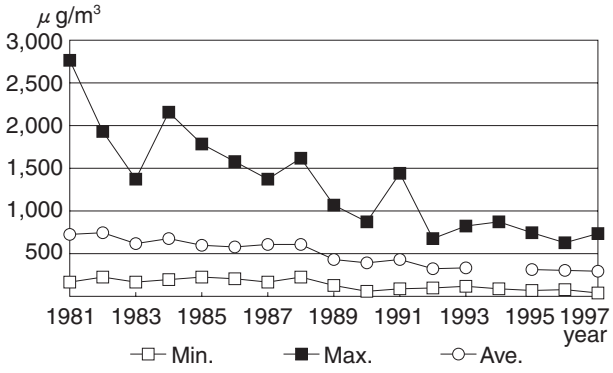
Note: n.a. (not available)
Source: Matsuoka et al. [2000]

Figure 4 SO_2 Emissions in China



Source: China Environment Yearbook

Figure 5 TSP Concentration in China



Source: Li [1999]

the system-making stage. Big events for the system-making happened in 1992, that is, NEQA Amendments and establishment of Ministry of Science, Technology and Environment (MOSTE), which has three departments in the environmental section; Office of Environmental Policy and Planning (OEPP), Pollution Control Department (PCD) and Department of Environmental Quality Promotion (DEQP) (see Figure 7(a)). ERTC is located under DEQP. These are the main developments of the environmental law and administration system in Thailand. Also, State of the Environment has been issued since 1995. There are 52 air monitoring stations under PCD at present (see Table 3).

After the financial crisis and the establishment of the new constitution in 1997, the Ministry of Natural Resources and Environment was just finalized in October 2002 (Figure 7(b)). The new ministry is to manage both so-called green and brown issues, which the former ministry could not handle due to the administrative separation by issues, but the Department of Industrial Works (DIW), which is responsible for factory inspection and actual regulation, still belongs to a different ministry. Restructuring of the environmental administration still has remaining tasks in this regard.

It can be said that Thailand achieved the three benchmarks of environmental law, environmental administration and environmental information in the mid 1990s but, due to the financial crisis in 1997 and restructuring of the ministries in 2002, it is again experiencing the final developments of the system-making stage.

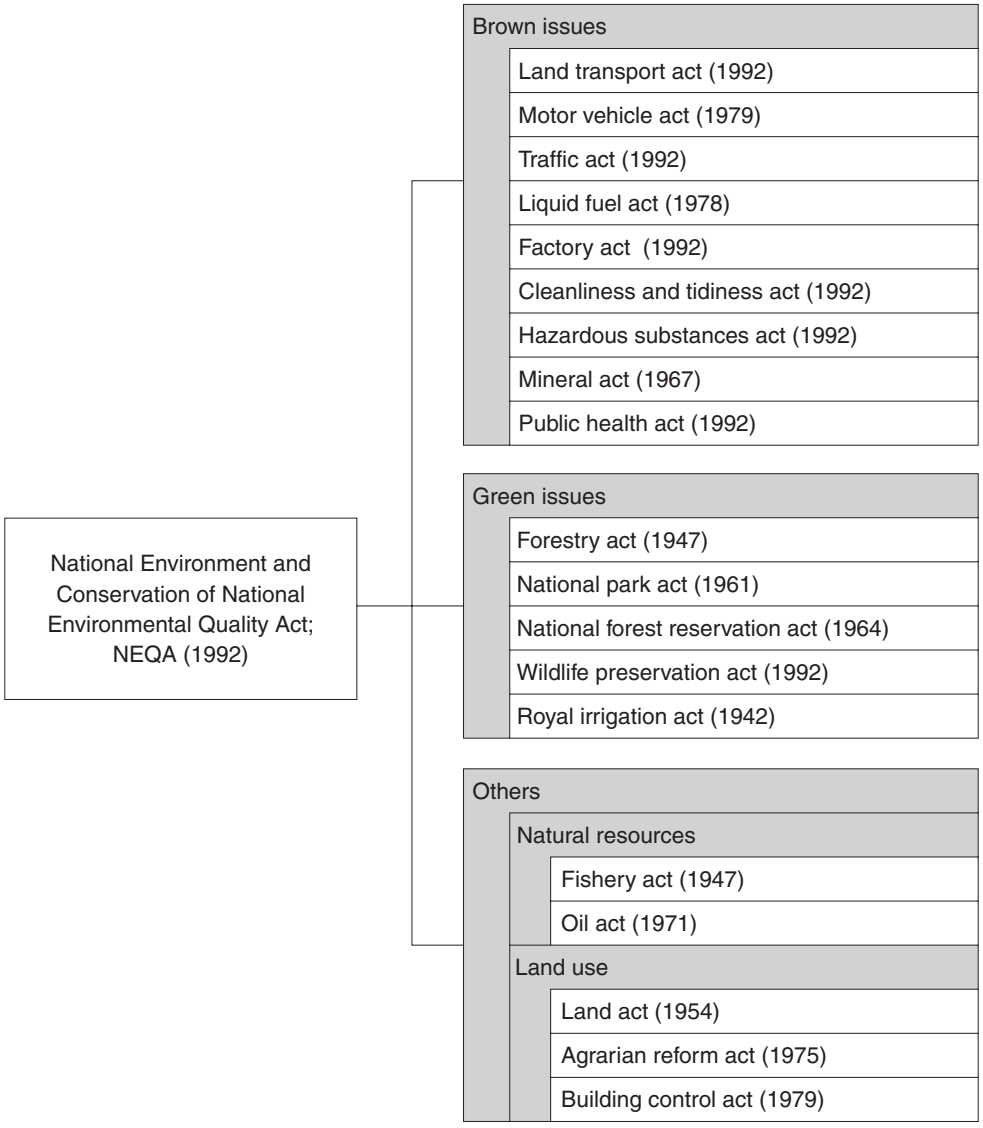
Figures 8 and 9 indicate SO_2 emissions in Thailand and PM_{10} concentration in Bangkok, respectively. Energy shift to low-sulfur (0.5%) heavy oil and natural gas in station-

Table 4 Chronological Summary of Environmental Policy and Environmental Center in Thailand

Year	Environmental Laws and Policies	Institution	Development Plan and Others	Environmental Research and Training Center (ERTC)	GDP/capita, growth rate
1969	The Factory Act				6.5%,
1975	The Improvement and Conservation of National Environmental Quality Act (NEQA)	The National Environmental Board (NEB) was established. The Office of the National Environment Board (ONEB) was established			US$800, 5%.
1978	Amendment of the NEQA Road Traffic Act	The NEQA authorized the Ministry of Science, Technology and Energy (MOSTE) to initiate an EIA process	The 4th Five-year National Economic and Social Development Plan (1977-81)		US$1,120, 10%
1981	The 1st National Ambient Air Quality Standards (NPAAQS)	The NEQA authorized the Ministry of Science, Technology and Energy (MOSTE) to initiate an EIA process	The 4th Five-year National Economic and Social Development Plan (1977-81)		Economic boom during 1980s-early1990s (1985-1995, aver. 8.4%)
1983				Project request	
1990				Project agreement (March) Project started (April)	
1992	The Enhancement and Conservation of the National Environmental Quality Act (NEQA/92) Industrial Factories Act Hazardous Substance Act Public Health Act Land Transport Act Traffic Act Energy Conservation Promotion Act	Replacing the ONEB with the Office of Environmental Policy and Planning (OEPP), the Pollution Control Department (PCD) and the Department of Environmental Quality Promotion (DEQP) under MOSTE. Establishing an Environmental Fund chaired by the Permanent Secretary of MOSTE.	The 7th National Economic and Social Development Plan (1992-1996) set definite targets to improve environmental quality, involve local people in the environmental management, recognize the role of NGOs in supporting people's participation in natural resources management		Mae Moh power plant incident. US$4,850, 8.1%
1995				Project phase completed (March) Follow-up phase started (April)	
1997	The 20-year Environmental Quality Promotion Policy was prepared by the OEPP. A 5-year Environmental Quality Promotion Action		The new Constitution (Decentralization and people's participation in environmental Protection, Article 79). The 8th National Economic and Social Development Plan (1997-2001)	Follow-up phase completed (March)	Financial crisis (1997-1998) US$6690, -0.4% (GNI per capita: 2,780)
1999	Decentralization Plan and Process Act				-11%
2000		The Civil Service Commission accepted a proposal to reorganize several major ministries.	The Cabinet approved A Decentralization Master Plan		US$6,700, 4%
2002		A new Ministry of Natural Resources and Environment (October)	The 9th National Economic and Social Development Plan (2002-2006)		3.9% in 1st quarter

Source: ADB (2001), Nicro and Apikul (1999), O'Conner (1994)

Figure 6 Environmental Law System in Thailand

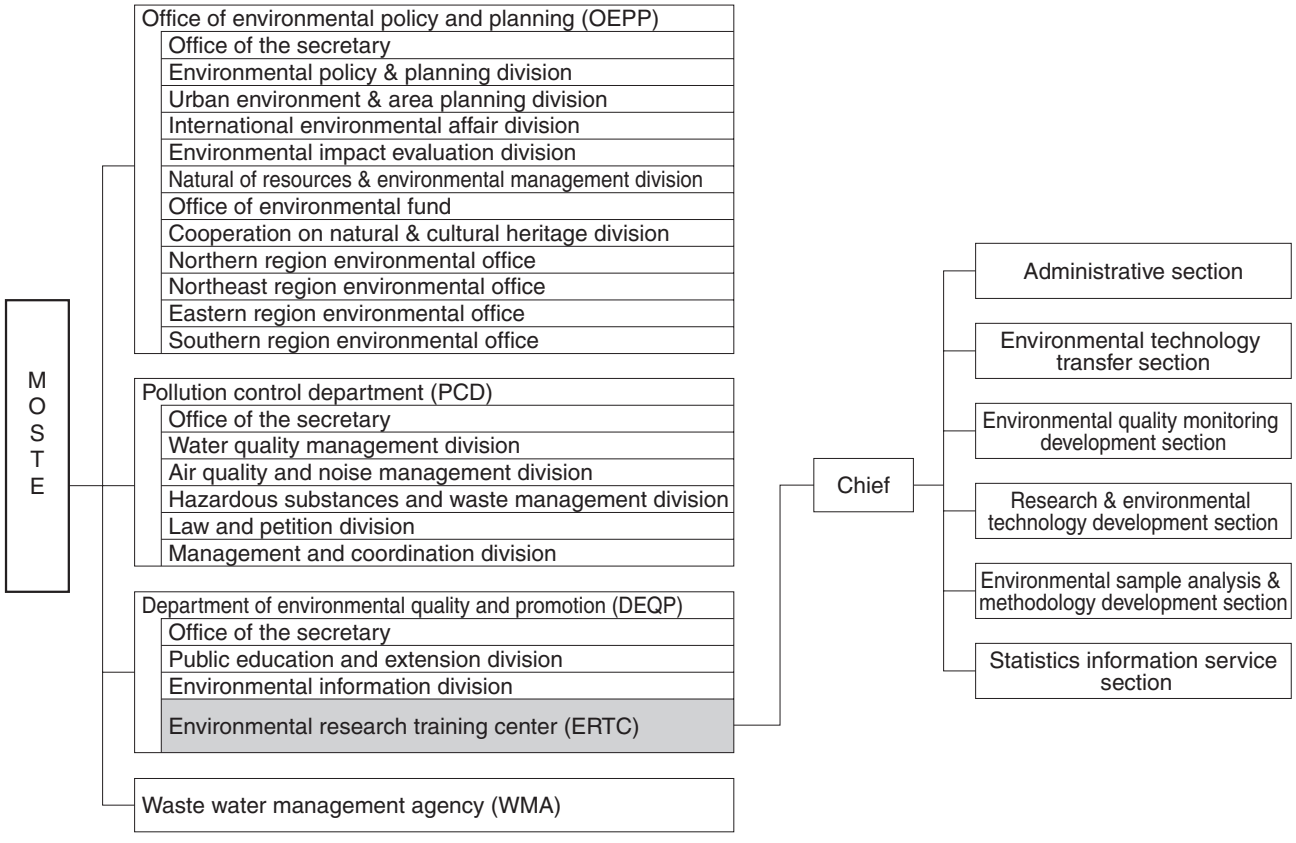


Source: Ogano [1994], JICA [1997], Hag et al. [2002]

ary sources such as factories and power plants and introducing unleaded gasoline to vehicles may have contributed to reducing SO_2 emissions in the 1990s but the estimation in the figure does not clearly indicate the decline of emissions. As for PM_{10}, some fluctuations are observed but it far exceeds the environmental standard (120 μ g/m^3) through the years. The financial crisis has also affected the environmental quality.

Decentralization of environmental management is presently in transition. Based on the new Constitution in 1997 and Decentralization Plan and Process Act in 1999, most of the functions will be handed over to the provincial and local governments in around five years. Therefore, developing SCEM at local levels is extremely important in Thailand. On the other hand, the environmental efforts in the firmand citizen sectors are increasing. Over 500 firms have obtained ISO14000 series certifications and there are a lot of active local environmental NGOs. One example is a regional environmental management NGO, Samut Prakarn Environmental Society (SES). This society, which has a variety of stakehold-

Figure 7(a) Environmental Administration in Thailand (Ministry of Science, Technology and Environment; MOSTE)



Source: JICA [1997]

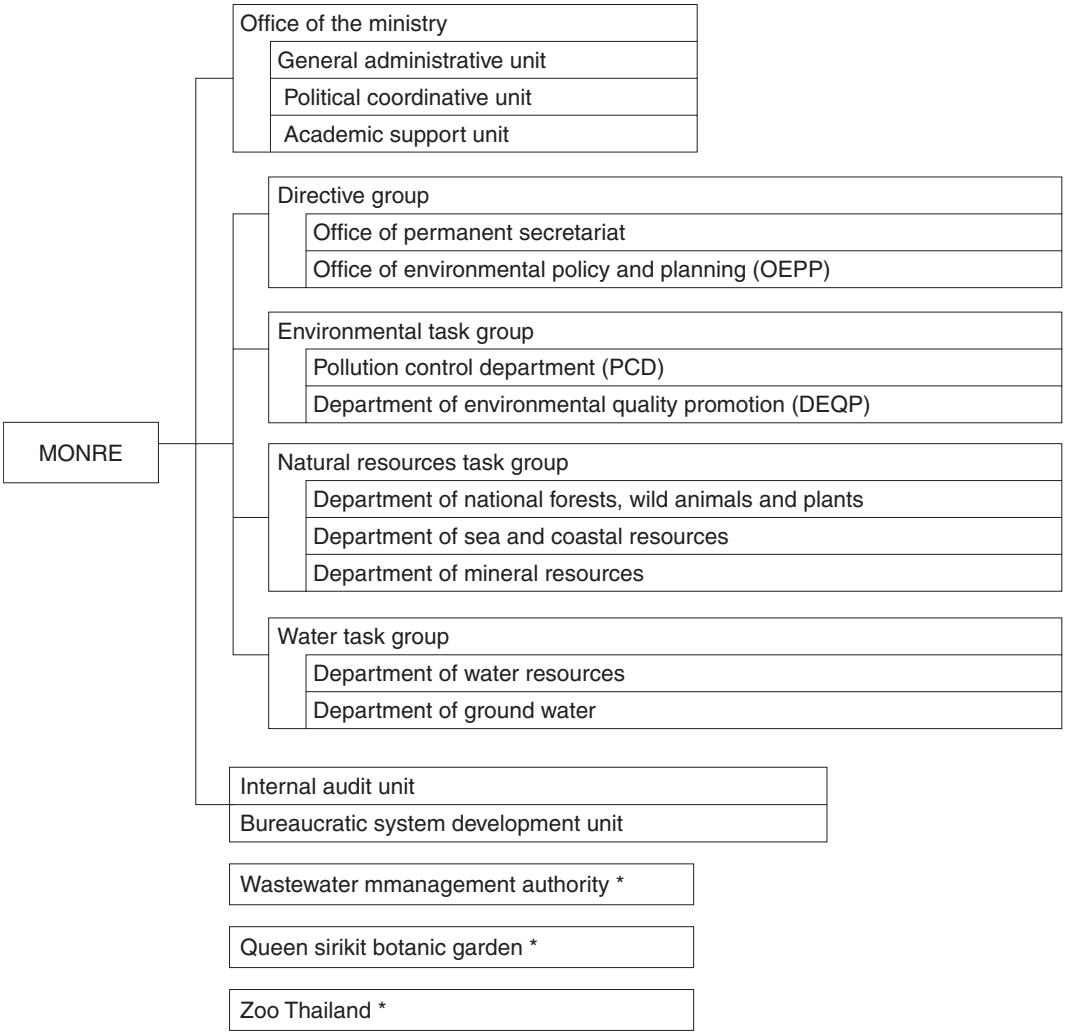
ers from local firms, central and local governments, NGOs and universities, is implementing a cleaner production technology project and several environmental education programs. Although SES has administrative and financial problems, it can be a model for future development of SEMS in Thailand.

3.4 Indonesia

As shown in Table 5, Indonesia's environmental law and administration was initially finalized in the late 1980s and early 1990s. After Act No.4 on the Basic Provision for Environmental Management was approved in 1982, which can be regarded as the start of Indonesia's system-making stage of SEMS, several important acts were set in force (Provision and Guidelines on Environmental Impact Assessment in 1986 and 1987, establishment of industrial water emission standard and air ambient standard in 1988, etc.). Figure 10 shows major environmental laws and regulations in Indonesia. The first appearance of environmental section in the ministry is the Ministry of Development Supervision and Environment in 1978, followed by the State Ministry of Population and Environment (1983), Environmental Impact Management Agency (BAPEDAL) (1990) and the State Ministry of Environment (1993). Figures 11(a) and 11(b) show the structure of BAPEDAL, which has the Environmental Management Center (EMC), supported by JICA, and then, the Ministry of the Environment.

With these institutions being developed, the Cleaner River Program (PROKASIH) was launched in 1989 for water pollution control in the major rivers through the nation which covers 17 provinces, 80 rivers and 600 fac-

Figure 7(b) Environmental Administration in Thailand (Ministry of Natural Resources and Environment; MONRE)

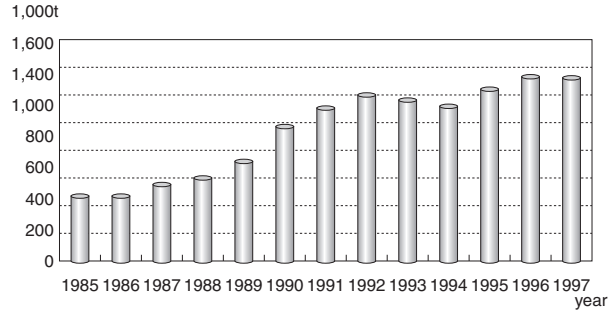


Note: * government enterprise
Source: MONRE website

tories, and the Blue Sky Program (LANGIT BIRU) has been implemented since 1992 for air pollution control. In addition, the Clean and Green City Program for urban environmental management was enacted in the late 1980s, but all these programs are not necessarily successful due to the structure and the financial crisis which was followed by unstable political situation.

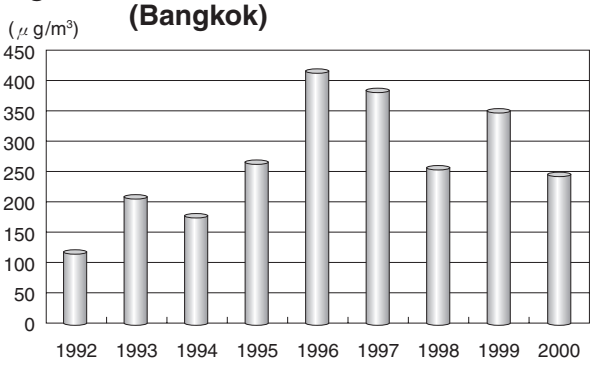
As for environmental information, a nationwide network has not yet been developed. The 59 environmental laboratories built with support by the Japan Bank for International Cooperation (JBIC) and AusAID are not online in a networking system except for the Austria-supported automatic monitoring network in another ten cities. One of the reasons for this is that these laboratories belong to three different ministries: the Ministry of Health, the Ministry of Public Works, and the Ministry of Industry and Trade. Although the Ministry of Environment has been trying to keep the labs and data after the new ministry was set up in January 2002, it would take a pretty long time to establish a nationwide environmental monitoring network under one administration since the administrative transition depends upon provincial and local gov-

Figure 8 SO_2 Emissions in Thailand



Source: Streets et al. [2000]

Figure 9 PM_{10} Concentration in Thailand (Bangkok)



Source: BMA [2000]

ernments[3]. No periodical environmental data and policy report like the State of the Environment has yet been issued[4] though Indonesia does produce annual environmental statistics, which are predominantly on forest, land use and water with only a few pages for air pollution. These facts imply that Indonesia is still in the final phase of the system-making stage. Environmental quality data such as SO_2 emission estimates and TSP concentration (Figures 12 and 13) also support the tentative conclusion.

Indonesia's environmental administration has now entered the second phase of the system-making stage since decentralization of environmental administration in January 2001 and establishment of the new Ministry of Environment (see Figure 14) from the State Ministry of Environment and BAPEDAL needs a period of time, at least for the period of the National Development Plan (PROPENAS, 2001-2004), to get settled and to actually work.

The new Ministry of Environment adopted the Strategic Plan and Work Program and PROKASIH2005 with seven priority issues such as local government's capacity development in environmental management and environmental awareness building in civil society and community for good environmental governance. In order to achieve this target, it is essential to develop administration capacity at both central and local levels and also to develop capacity in the firm and citizen sectors as well as to strengthen coordination among the three actors. NGOs can play an important role in social environmental management especially when the government is immature and not so functional. WALHI (Friend of the Earth, Indonesia) is a good example.

3.5 Development of SEMS and Appropriate Environmental Cooperation

The evaluation summary of Social Environmental Management System (SEMS) and the Environmental Center projects in three countries is shown in Figures 15 and 16. China completed its system-making stage and entered the system-working stage around in 1994. Now it has started shifting toward the self-management stage. China's social environmental management will accelerate toward the Beijing Olympic Games, which will be held in 2008.

Thailand was once ready for the system-working stage around in 1995 but some more time is needed to finalize system-working. It is experiencing a restructuring of the system and a shift to the system-working stage at the same time. Indonesia does not have an adequate environmental information system and, as with Thailand, the financial crisis and recent administration restructuring gave the country some difficulties for functional environmental management.

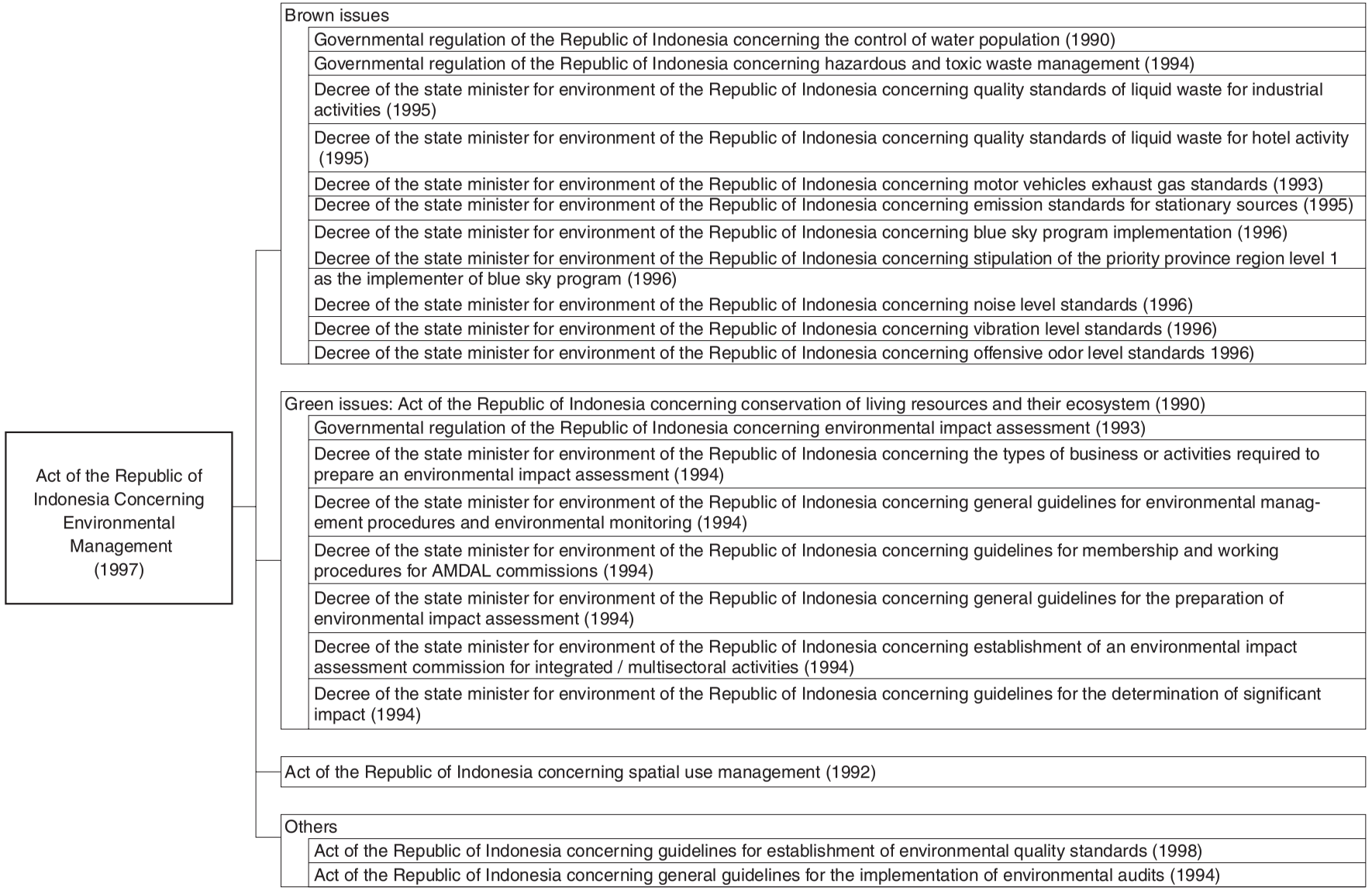
As for the entry and exit points of Environmental Center projects, the project in Chi-

Table 5 Chronoloical Summary of Environmental Policy and the Environmental Center in Indonesia

Year	Environmental laws and policies	Institutions	Development Plan	"GDP/capita (current international US$), growth rate"	Environmental Management Center (EMC)
1973			The Second Five-Year Development Plan: National policy in environmental affairs (Chapter II Article 10 of the State Development Guideline)	US$480 (1974); 8.3%	
1978	Presidential Decree No. 28/1978 jo. Presidential Decree No. 35/1978	State Ministry for Development Supervision and Environment		US$640; 9.2%	
1982	Act No. 4/1982 on the Basic Provision for Environmental Management			US$1,000; 1.1%	
1983	Presidential Decree No. 25/1983	State Ministry of Population and Environment		US$1,070; 8.4%	
1990	Presidential Decree No. 23/1990	BAPEDAL (Environmental Impact Management Agency) establishment		US$2,070; 9.0%	
1990	Act No. 5/1990 on Natural Resources Conservation and Ecosystem				
1993			The Sixth Five-Year Development Plan (Repelita VI) focused on enhancing coordination in the environmental affairs toward sustainable development	US$2,700; 7.3%	Project started(January)
1994		State Ministry of Environment			
1997	Act No. 23/1997 on the Environmental Management			US$3,490; 4.9%	
1996	Ministerial Decree No. 07/1996	Secretariat of the National Coordination Team for Forest and Field Fires Control			
1997				Economic crisis	Project completed (December)
1998				Presidential succession, Growth rate: -13.2%	Follow-up phase started (January)
1999			The Five-Year National Development Program (Propenas) focuses on sustainable natural resources management to increase public welfare	US$2,900 in year 2000 (estimation); 1.0%	
1999	Act No. 22/1999 on Regional Autonomy (Decentralization) taking effect in 2001				
2002	Presidential Decree No.2/2002, Article 56a	The merge of the BAPEDAL into the State Ministry of Environment (New Ministry of the Environment)			Follow-up phase completed (March) Phase 2 started (July)

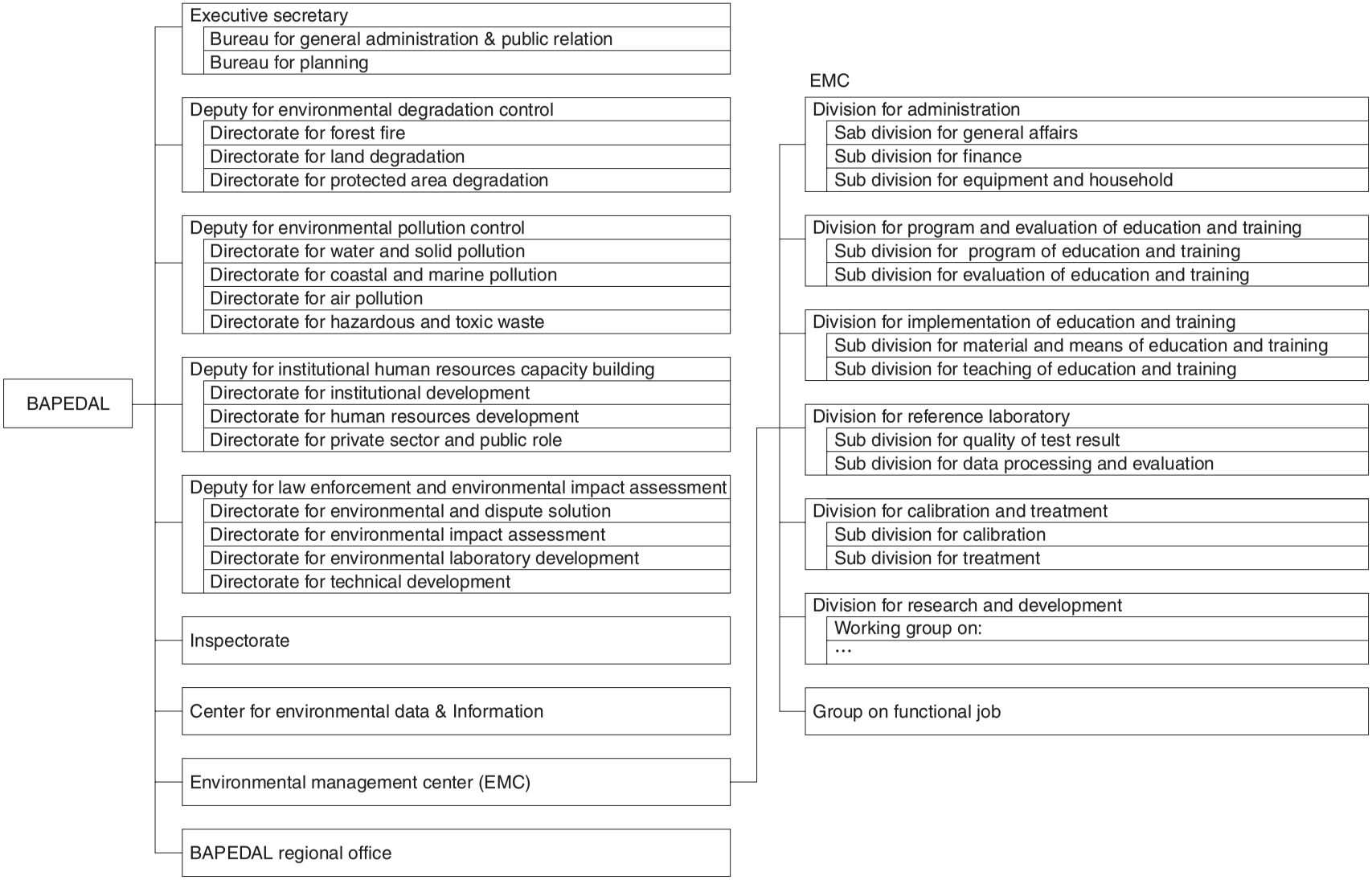
Source: BAPEDAL website, World Bank [2002], CIA website

Figure 10 Environmental Law System in Indonesia



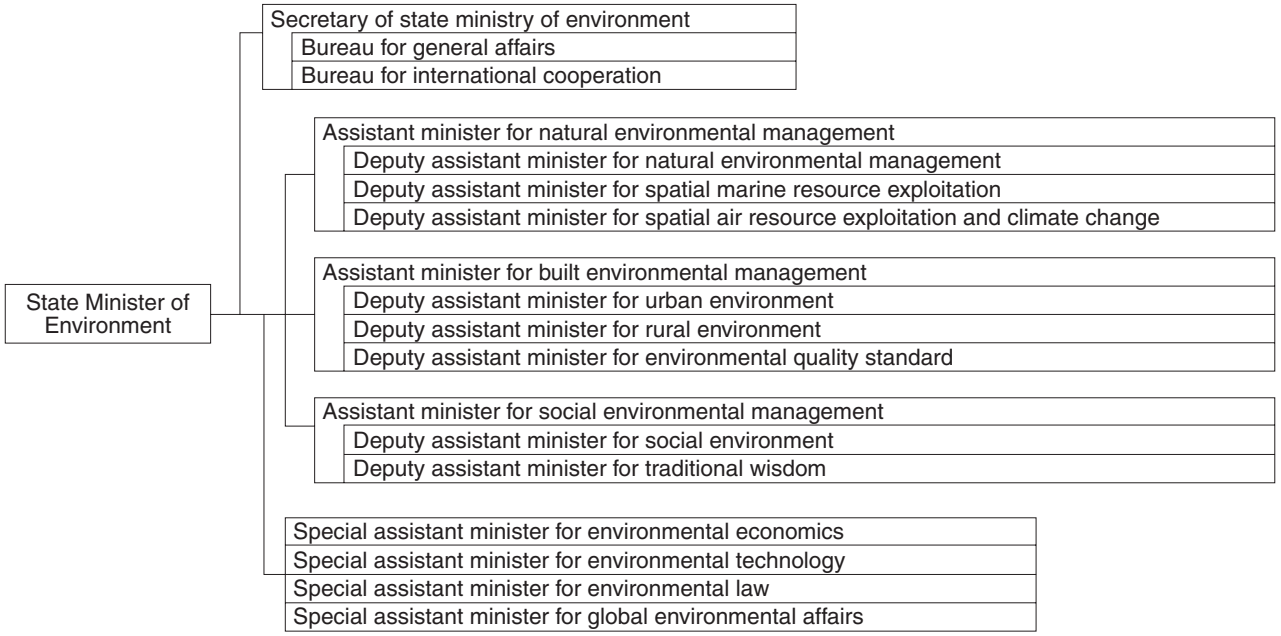
Source: Global environmental forum [1999]

Figure 11(a) Environmental Administration in Indonesia (BAPEDAL, before 2002)



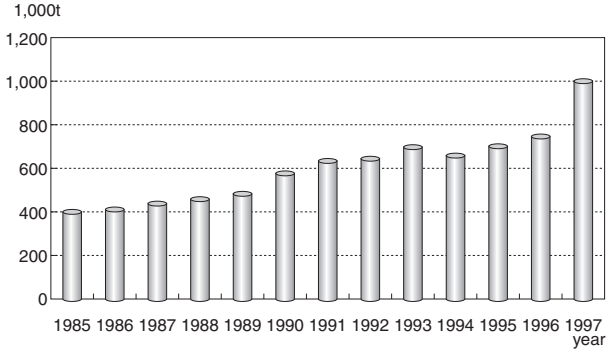
Source: JICA [2000]

Figure 11 (b) Environmental Administration in Indonesia (State Ministry of the Environment, before 2002)



Source: JICA [2000]

Figure 12 SO_2 Emissions in Indonesia



Source: Streets et al. [2000]

na started in 1992, which well match the final phase of the system-making stage, and the center is now in the third phase of the project. Although the project completion, or the exit point, has not come yet even after the country is experiencing the full development of the system-working stage, now the project has a new mission to support the center to make more contributions to social environmental management by setting up four targets: air quality management in wider areas, improvement in environmental management, chemical pollutant management such as dioxin, environmental protection in the Great Western Development regions.

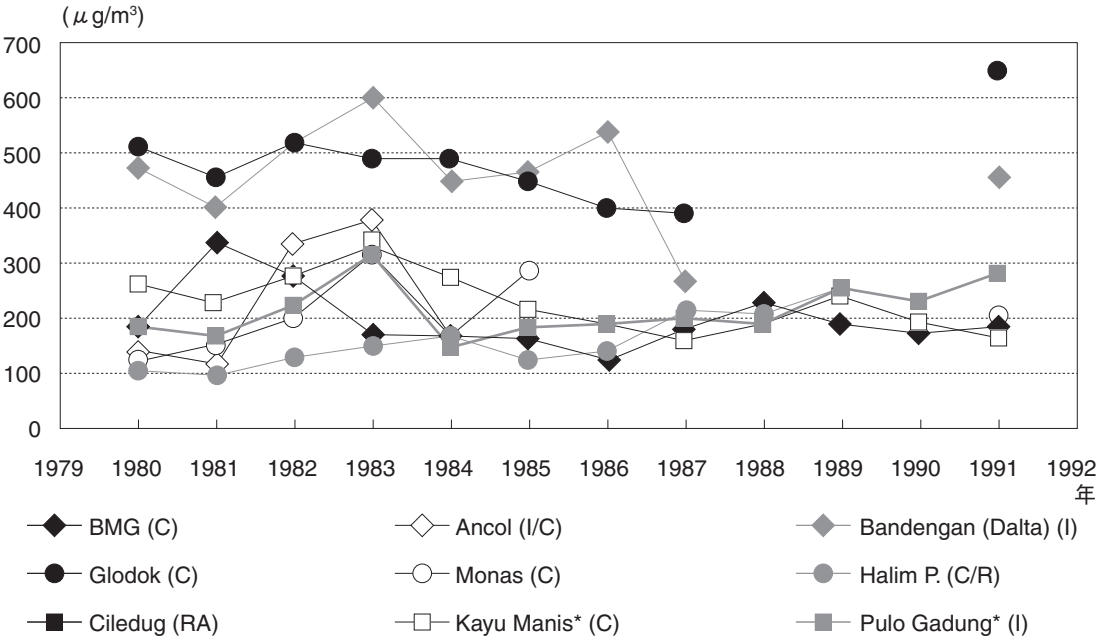
The Environmental Center (ERTC) project in Thailand started in 1990 and completed in 1997. The entry and exit points of the project matches the period from the final phase of the system-making stage to the system-working stage though Thailand is experiencing a reform after 1997.

Indonesia's Environmental Management Center project has started in 1993 and is now in the second phase. As mentioned earlier, Indonesia is having a longer period of the system-making stage due to the financial and political crisis and it needs supports for EMC to function well in the environmental administration and also in the Social Environmental Management System.

Notes:

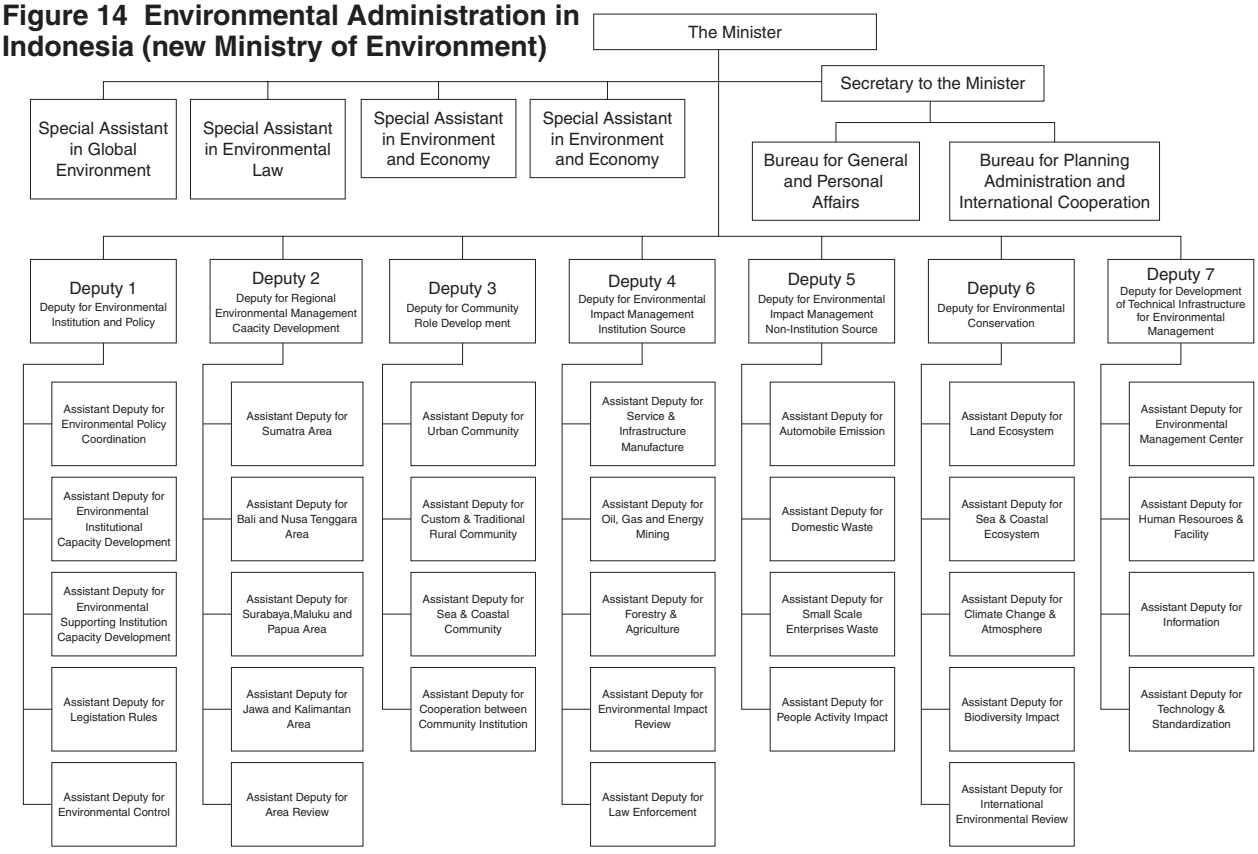
1. The data does not include SO_2 emission from households and non-point sources. Also note that there is a lot of criticism on the reliability of statistical data of China.
2. TSP concentration is quite different in northen and southern China. Standard attainment in northern cities is only about 20 % while that of southern cities is as high as 70-80%. The case of SO_2 also indicates

Figure 13 TSP Concentration in Indonesia (Jakarta)



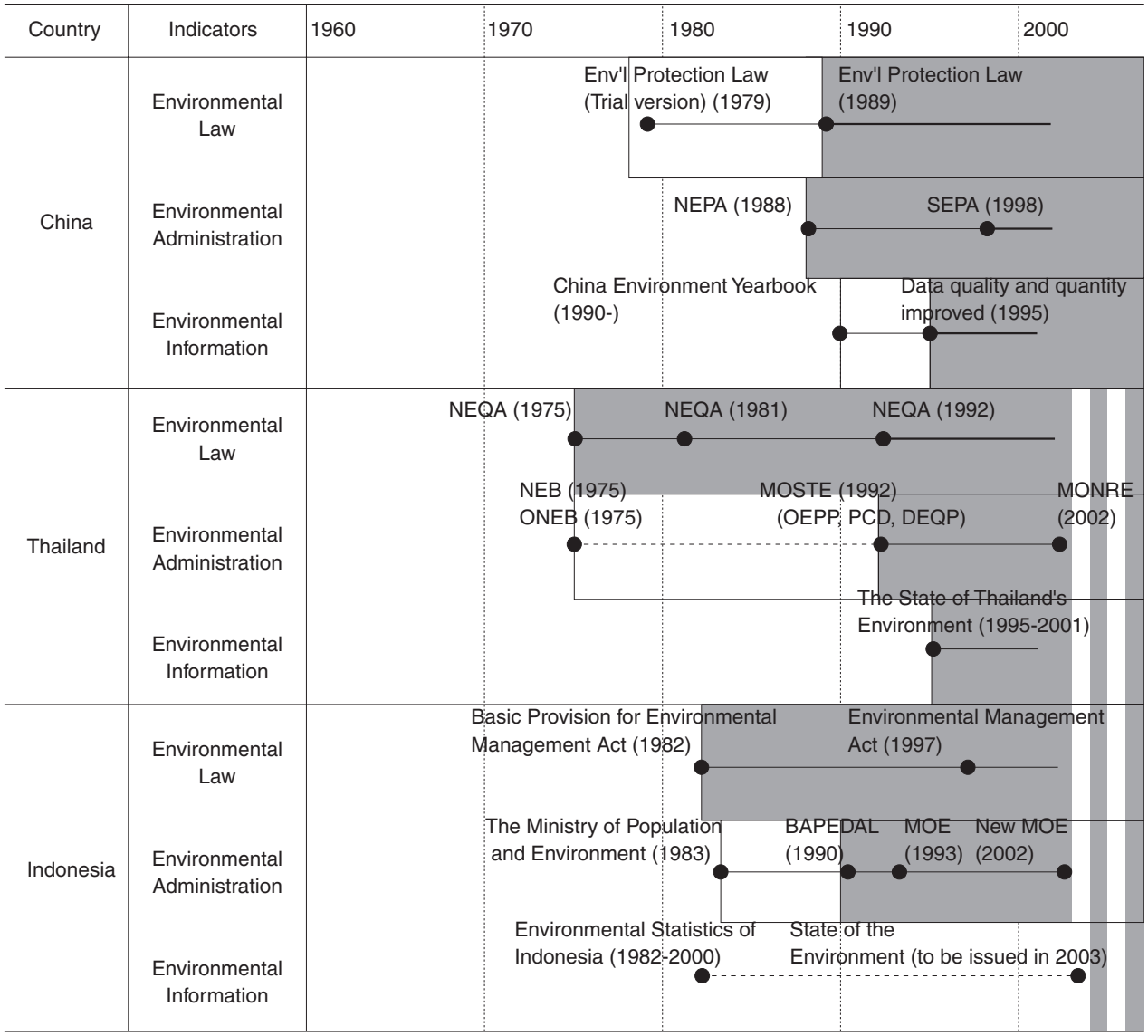
Note: (R), (I), (C) indicate living area, industrial area, and commercial area respectively.
Source: World Bank (1997)

Figure 14 Environmental Administration in Indonesia (new Ministry of Environment)



Source: Material obtained from the field survey (August 2002)

Figure 15 System-making Stage in Three Countries



Source: The author

similar situations [Matsuoka et al. 2000].

3. So far only one laboratory in Medan moved to the Ministry of Environment (as of August 2002) and the second phase of the EMC project is supporting it as a model city for local environmental management.
4. The first State of the Environment is to be published in 2003 from Ministry of the Environment (from interviews with ministry officials).

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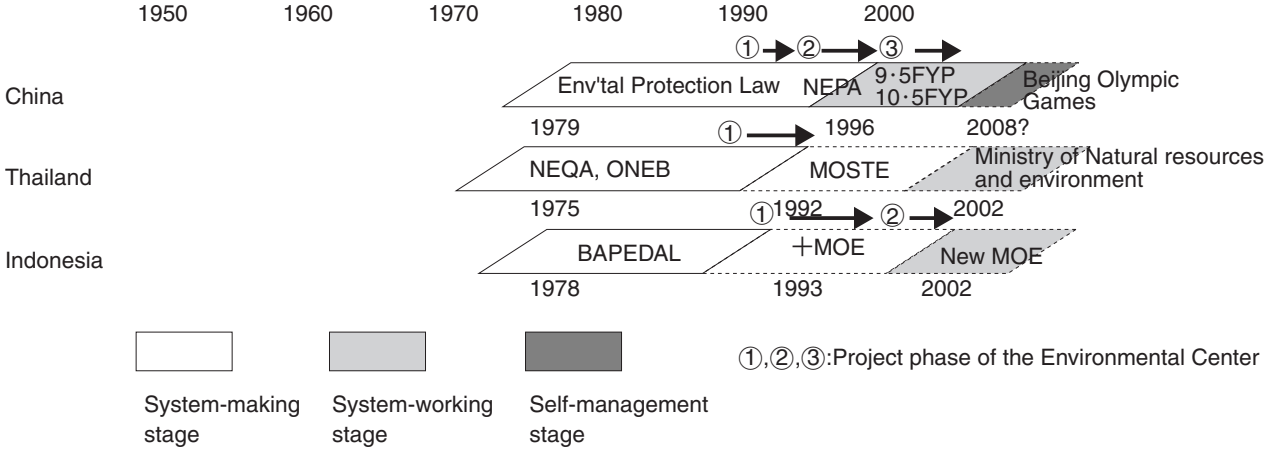
Figure 16 Development Stages of Social Environmental Management System (SEMS)



Note: FYP indicates Five Year Plan
Source: The author

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Chapter 4

Social Capacity Development for Environmental Management and Japan's Cooperation in China

Introduction

The Social Environmental Management System, which has been commonly recognized as environmental governance, is about how societies deal with environmental problems. It is concerned with the interactions among formal and informal institutions and the actors within society that influence how environmental problems are identified and framed (or defined). It also relates to how environmental issues reach the political agenda, policies are formulated, and programs implemented[1].

As in the industrialized countries, environmental protection in China has been growing with the arising of enormous environmental problems and evidence of their damage to the habitat and to the public health. The causes of environmental problems and environmental governance have much correlation with China's social and economic development. International cooperation plays a role not only in addressing global environmental issues, but also in improving domestic environmental governance.

This paper focuses on China's Social Capacity Development for Environmental Management and the role played by bilateral cooperation with Japan. In order to do this, the evolution of China's environmental management will be described, followed by the introduction of China's Social Environmental Management System including three major actors, the government, firms and citizens, and their interactions in dealing with environmental problems. This paper also provides an overview of environmental policies in China. Finally, the role of Japan's cooperation in China, especially the establishment of the Sino-Japan Friendship Center for Environmental Protection, will be assessed.

4.1 Evolution of China's Environmental Management

The evolution of China's environmental management can be summarized into 5 stages and each stage is represented by strategic transformation in ideology or significant events. To do this, a simplified Time-Situation- Pressure-Response Matrix is applied reflecting the following aspects:

- the domestic social and economic situation;
- major environmental pressures; and
- responses, including regulatory arrangements (RA), institutional arrangements (IA) and significant environmental programs and actions (SEP&A).

Stage 1: 1949-1972

The Time-Situation-Pressure-Response Matrix (TSPR Matrix) for Stage 1 is described in Table 1.

To sum up, pollution problems just began and associated environmental deterioration was not evident in this period. Environmental problems emerged gradually and were regarded only as "three-wastes", which were not linked with economic development nor put onto the political agenda. The concept of environmental management was not formed. Neither independent regulatory construction nor institutional construction had started.

Stage 2: 1973-1982

The Time-Situation-Pressure-Response Matrix for Stage 2 is described in Table 2.

In summary, environmental protection was correlated with social and economic development rather than simply regarded as "three-wastes". The concept of environmental

Table 1 TSPR Matrix for Stage 1

Factor		Time	Description
Social & Economic Situation		1949-1958	In this period, China carried out rehabilitation of the national economy and the first-five-year-plan after the civil war.
		1958-1965	This is China's "Great Leap Forward" period and the number of industrial enterprises, especially small-scale steel and iron plants, increased sharply. The urban population grew rapidly.
		1966-1972	The well-known "Great Cultural Revolution" began in this period. Industrial construction was devoted to quantitative development rather than qualitative development. The layout of industry adopted a strategy of "on the mountains, decentralization and in deep valleys".
Environmental Pressure			Industrial pollution without proper abatement facilities, especially air emissions and wastewater discharge resulted in environmental pollution. Inappropriate layout of both industrial development and urban construction disturbed the eco-system and led to environmental damage.
Response	R A	1956 1957 1963	Neither environmental laws, nor specific environmental regulations existed. The content of environmental protection was included in other administrative regulations, represented *by Hygiene Criterion for Industrial Enterprise Designing, Program on Conservancy of Water and Soil and Regulations on Forest Protection.*
	I A		There was no independent environmental institution, except for "three-wastes[1]" management division or office of comprehensive utilization established in some regions or in other state departments.

* "Three-wastes" refers to air emissions, wastewater discharges and solid wastes generated from the industrial sector.
Source: The authors

Table 2 TSPR Matrix for Stage 2

Factor		Time	Description
Social & Economic Situation		1973-1982	The ten-year "Great Cultural Revolution" made China's economy badly decline. In December of 1978, a strategic decision to shift priorities to the construction of socialist modernization was made by the Third Plenary Session of the Eleventh Central Committee. China has implemented a reform and opening-up policy and started transition from a planned economy to a market economy since 1978.
Environmental Pressure		1958-1965	Regional pollution and environmental damage increased and in some cities with concentrated industries, environmental deterioration occurred.
Response	R A	1973	*Industrial "Three-Wastes" Discharge Standard (Trial Version)* was enacted and implemented with regulatory force. This Standard was an important supplement to previous criterion, which emphasized environmental quality.
		1978	*The Constitution of the People's Republic of China* was enacted and environmental protection was defined in this state fundamental law.
		Sept. 1979	*The Environmental Protection Law (Trial Version)* was enacted. Three legal systems, i.e. System of Environmental Impact Assessment, System of "Three-Synchronous Requirements" and Pollution Levy System were defined by the Law.
		1982	Environmental quality standards were issued, including *Atmospheric Environmental Quality Standard and Marine Water Quality Standard*, etc.
	I A	Dec.1974	The Leading Group on Environmental Protection of the State Council, consisting of members from 20 state departments was founded. This was the beginning of China's institutional construction.
		1979-1981	Local governments established environmental protection bureaus or relatively independent environmental protection offices. In addition, sectoral environmental protection organizations were set up. *The Environmental Protection Law (Trial Version)* contributed greatly to the development of environmental institutional construction.

Source: The authors

management was formed and developed in the direction of strengthening environmental governance. This ten-year period can be regarded as the fundamental stage, when environmental regulations, laws, standards, organizations were started to be established and legal systems of both regulatory and economic instruments began to be formed for the enforcement of environmental management. Three fundamental principles of China's envi-

ronmental governance were also formed, i.e. i) the principle of coordinated development of economic construction and environmental protection; ii) the principle of emphasizing prevention, integrating both prevention and control and comprehensive abatement, and iii) the principle of polluter pays. Environmental protection has been on the political agenda since this period. However, the capacity of environmental management and supervision was still weak and required further strengthening.

Stage 3: 1983-1988

The Time-Situation-Pressure-Response Matrix for Stage 3 is described in Table3.

Generally speaking, China's environmental protection achieved significant development in this stage and the capacity of environmental management was greatly strengthened in terms of both regulatory and institutional development . From a policy point of view, environmental protection was assigned great importance by the State and was defined as a fundamental state policy. A framework of environmental policies focusing on strengthening environmental governance was set up consisting of three major policies. A systematic framework of environmental laws and regulations was formed. The system of environmental standards was preliminarily established. Eight environmental legal systems, including three old legal systems defined in stage 2 and five new systems stipulated in this stage, were implemented as basic instruments for the enforcement of environmental policies.

Stage 4: 1989-1995

The Time-Situation-Pressure-Response Matrix for Stage 4 is described in Table 4.

In this stage, environmental deteriora-

Table 3 TSPR Matrix for Stage 3

Factor		Time	Description
Social & Economic Situation		1983-1988	China's economy grew rapidly with an average annual growth rate of 10% and was characterized by fast urbanization and industrialization. Township and village enterprises (TVEs) grew vigorously.
Environmental Pressure			High energy consumption and high material consumption resulted in high emission levels. The total load of emissions increased continuously, which led to degradation of environmental quality and deterioration of the ecological environment.
Response		Dec. 1983	Environmental protection was defined as a Fundamental State Policy. Strengthening environmental governance became the focus of environmental protection.
		1983-1989	An environmental policy framework with emphasis on strengthening environmental protection was set up, including three major policies, i.e. "prevention first and an integration of prevention and abatement", "polluter pay, polluter control" and "enhancement of environmental governance".
	R A	1983-1988	Legal institutions were strengthened. A systematic framework of environmental laws and regulations was established, consisting of i) environmental law; ii) resource conservation law; and iii) environmental regulations
		1983-1988	A system of national environmental standards was preliminarily established.
		1983-1988	Five new environmental systems were defined and enforced in this stage, including System of Deadline Setting for Pollution Control, System of Water Pollutant Discharge Permit, System of Goal-Responsibility for Environmental Protection, System of Quantitative Examination of Integrated Urban Environmental Management and System of Centralized Pollution Abatement, etc.
	I	May, 1984	The Environmental Protection Committee was established by the State Council to strengthen state leadership over environmental protection. The Committee was chaired by a Vice-Premier and composed of ministers from relevant state sectors.
	A	March, 1988	The National Environmental Protection Agency was separated from the Ministry of Urban Construction and Environmental Protection and became an organization directly reporting to the State Council.

Source: The authors

Table 4 TSPR Matrix for Stage 4

Factor		Time	Description
Social & Economic Situation		1989-1995	The national economy maintained a high growth rate. A vigorous socialist market-based economic system was established. However, the economic structure as well as industrial structure was not rational.
Environmental Pressure			nvironmental damage especially in urban areas became more evident and extended to rural areas. Both the scope and the degree of ecological deterioration were aggravated: i) the quality of most waters worsened; ii) air pollution was serious in terms of fine particulate pollution in urban areas, acid rain and gas exhaust from vehicles; iii) ecological degradation, characterized by deforestation, desertification and loss of biodiversity developed.
Response	R A	Dec.1989	The revised Environmental Protection Law was issued.
		1994	China's Agenda 21 was issued and implemented in response to the Rio's World Summit in 1992.
		1995	By the end of 1995, China issued 5 specific environmental protection laws, 8 resource conservation laws, over 20 environmental regulations and 364 national environmental standards. There were 600 environmental regulations issued by local governments.
		1989-1995	Environmental management shifted from end-of-pipe control to life-cycle management. Cleaner production and eco-labeling were then promoted.
	S E P & A	1989-1995	Industrial pollution prevention and control and integrated urban environmental management were implemented.
		1989-1995	Plantation programs, anti-desertification programs and ecological agriculture promotion programs were implemented.

Source: The authors

tion became more evident. Environmental protection was given a high priority by the Central Government. Sustainable development was defined as a national strategy for social and economic development. Environmental regulatory systems as well as environmental management instruments were strengthened.

Stage 5: 1996-2000

The Time-Situation-Pressure-Response Matrix for Stage 5 is described in Table 5.

To summarize briefly, environmental management shifted from concentration control over pollutants to total pollution load control in this stage, which was regarded as a fundamental change of environmental management. In addition to the capacity building of environmental management in terms of regulatory construction, a number of great environmental programs and actions focusing on industrial pollution control and urban environmental management were implemented to intensify environmental management. Not only the instrument of command & control which is dominantly employed, but also a mix of market-based instruments, public participation and information disclosure was enforced. The average annual total environmental investment in this stage reached 0.93% of GDP. The environmental awareness of the public increased greatly.

4.2 China's Social Environmental Management System (SEMS)

China's SEMS is the interactions among government, firms and citizens and the roles played by each actor in addressing environmental problems and improving the environemntal situations at both the national and local levels.

4.2.1 Government and its Role

Similar to other countries, China structures its environmental governance in three organizational systems: legislative bodies, judicial bodies, and administrative bodies (Figure 1).

Environmental legislative bodies

In China, environmental legislation at the national level is under the authority of the National People's Congress (NPC), which is the supreme hierarchy of state power responsible for national legislation including the en-

Table 5 TSPR Matrix for Stage 5

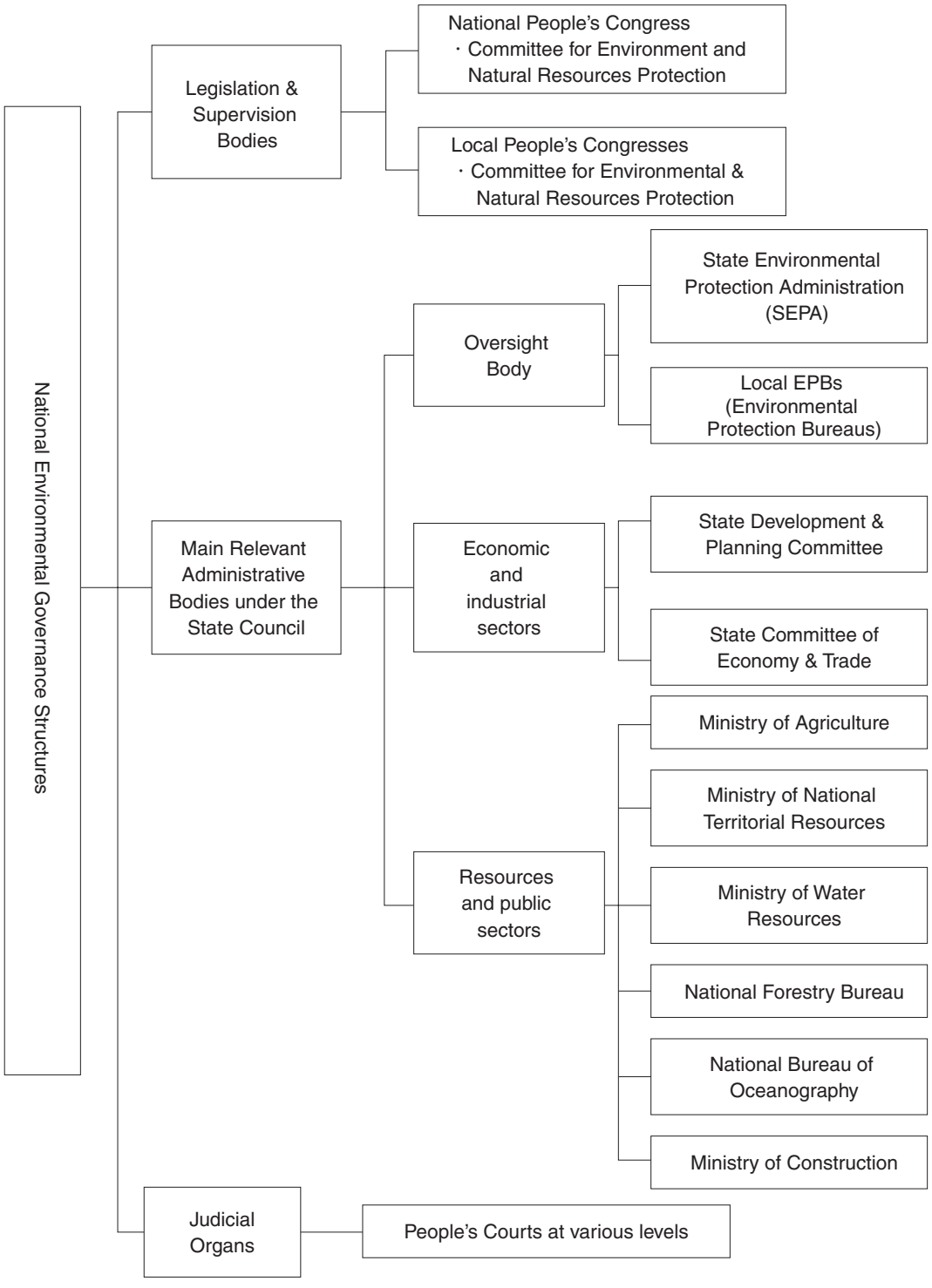
Factor		Time	Description
Social & Economic Situation		1996-2000	China's social and economic development realized great achievement. Productivity was upgraded and a buyer's market formed. The socialist market economy was established. An opening-up economy developed rapidly. Aimed at increasing the efficiency of energy consumption and material consumption, structural adjustment and transforming the pattern of growth were enforced. In this stage, the strategy of "The Great Development of West China" was implemented by the Central Government.
Environmental Pressure			The trend of ecological degradation has not been controlled effectively. Urban environmental pollution and non-point source pollution in rural areas are still developing. Though the targets of Total Pollution Load Control of Major Pollutants and environmental compliance of major industrial enterprises were achieved, the level of total emission load is still at a high level. Industrial pollution, urban environmental problems together with global environmental issues emerged in the same period of time.
Response	R A	Sep. 1996	*The Ninth Five-Year National Master Plan on Environmental Protection and Long-term Targets in 2010* was issued and implemented.
		Sep. 1996	*The Ninth Five-Year National Master Plan on Environmental Protection and Long-term Targets in 2010* was implemented, in which the Program of Total Volume of Pollution Control and China's Green Project Program were proposed.
		1996-2000	New laws and regulations were formulated and by the end of 2000, there were 6 environmental protection laws, 10 resource conservation laws, 34 environmental regulations and 427 national environmental standards. Ninety administrative rules were issued by the state environmental sector.
		1996-2000	Environmental management was shifted from concentration control to total pollution load control.
		1996-2000	The integrated environmental management strategy emphasizing both pollution control and protection of the ecological environment was implemented.
		1996-2000	Ecological conservation was put onto the agenda of the Great Development of West China.
		1996-2000	A mix of instruments including command & control instruments, market-based instruments, public participation and information disclosure was enforced.
	I A	March 1998	The National Environmental Protection Agency was upgraded to the State Environmental Protection Administration, a ministerial level organization
	S E P & A	1996-2000	The Program of Total Volume of Pollution Control was implemented over 12 major pollutants, including smoke, industrial dust, SO_2, COD, oil, cyanide, arsenic, mercury, lead, cadmium and Cr^{6+}.
		1996-2000	In light of the state policy on structural adjustment, a shut-down policy and the System of Deadline Setting for Pollution Control were implemented to enforce environmental compliance of all industrial enterprises.
		1996-2000	Project "33211" was implemented, including intensive pollution control over three rivers (Huaihe River, Haihe River and Liaohe River), three lakes (Taihu Lake, Dianchi Lake and Chaohu Lake), two designated control zones (SO_2 control zone and acid rain control zone); one city (Beijing) and one sea (Bohai Sea).
		1996-2000	Urban environmental infrastructure was constructed intensively.

Source: The authors

vironmental context. The Standing Committee of NPC acts as a regular body under the NPC to deal with general affairs. For environmental purposes, the Standing Committee established a sub-committee on environmental and natural resource conservation, which has mandates both to make preparations for environmental legislation and to supervise implementation of environmental laws and regulations by the Government.

At the national level, normally the State Environmental Protection Administration (SEPA) provides proposals for environmental legislation and submits them to the State Council. The State Council then reviews it and prepares bills with a consensus among relevant ministries. Next, the NPC starts its work on the bills, with further review, asking for comments from various circles, and achieving consensus among relevant interested parties. Finally, the proposed law/regulation can be enacted by the NPC. Cer-

Figure 1 National Structures of Environmental (and Natural Resource) Governance



Source: The authors

tainly, the NPC can also make a proposal for legislation.

At the local level, a similar process is employed in local environmental legislation. But the local process usually takes a shorter time because of a smaller jurisdiction and less coordination, compared to the national process.

In addition to environmental laws and regulations stipulated by the NPC, the State Council at the national level has the authority to issue national ordinances, decisions and rules as necessary, which also have legal force. Likewise, the SEPA can, independently or jointly with other relevant ministries, issue ministerial level decisions, rules, standards and administrative systems. At local levels, provincial and municipal governments have the same authority in their jurisdictions. But the local environmental protection bureaus (EPBs) have rather a mandate to implement environmental policy than to formulate policy, not like the authorities and missions their governments and the SEPA share.

Environmental administrative bodies

At the national level, the SEPA, a ministerial level administrative body, is mandated as an oversight body under the State Council, with general missions and responsibilities for formulating environmental policies, plans and standards and supervising implementation of policies nationwide. However, environmental management involves so many aspects of the socioeconomic system that it is beyond the capacity of one or even a few organizations to address all of them. Therefore, other relevant ministries are necessarily and naturally involved in environmental management. They mainly include economic and industrial sectors and resources and public sectors (Figure 2). For example, the State Committee of Development and Planning is responsible for the coordination and approval of national environmental plans and regional environmental programs. In many respects, the State Committee of Economic and Trade Commission is deeply involved in industrial pollution control, including industrial structural adjustment, layout and technology improvement; cleaner production technology; energy conservation; and the environmental industry. The Ministry of Construction manages urban environmental infrastructures including sewage pipe systems, sewage treatment, and garbage disposal. Other resources sectors, such as ministries of agriculture, forestry, water resources, national territory, etc., take care of environmental protection in their own authorities.

The local environmental administration in China is structured in three levels as a general administrative hierarchy: provincial/metropolitan/autonomous regions, municipalities, and districts and counties. Each local government installs its own EPB, and in many cases, EPBs in districts under municipal jurisdiction are built as branches of municipal EPBs. The structures of local EPBs including their affiliated organizations are, to some extent, similar to the SEPA but simplified in smaller size based on local necessities, and normally the lower, the smaller, from province to county. It is also true, the lower the EPB is from province to county, the more missions and responsibilities for implementation of policies and plans as well as programs the EPB takes on, and the less policymaking mandate the EPB has.

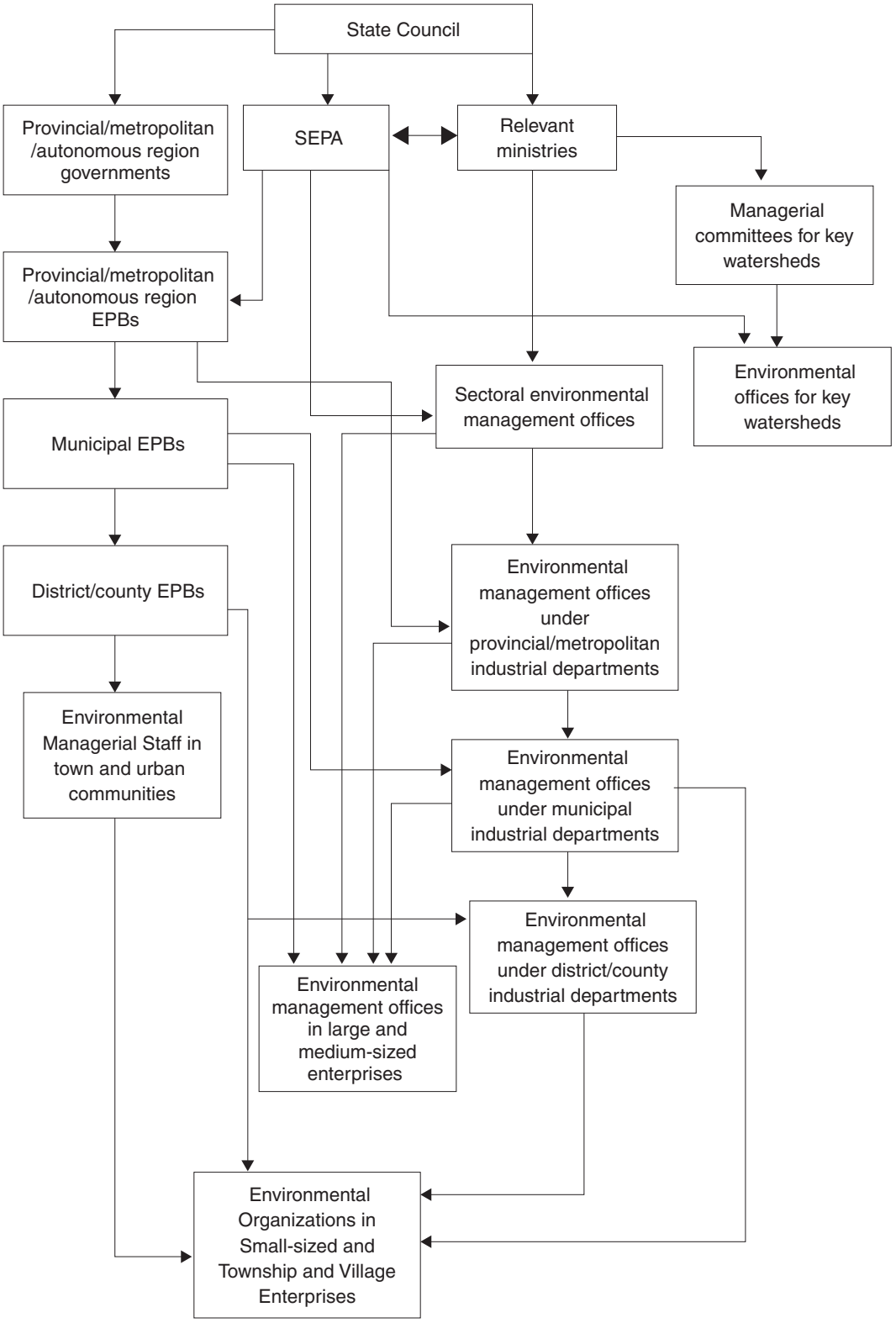
Environmental judicial organs

Environmental judicature is one of the important approaches to protecting environmental rights of social members and interested groups. The people's courts at all levels from the national to the local assume this responsibility. They deal with civil, administrative and criminal lawsuits concerning environmental issues and make final adjudication of the cases. In reality, most cases of environmental disputes and administrative disputes with regulated parties are resolved through administrative procedures of mediation, and only a few cases are filed in the courts.

4.2.2 Corporate Environmental Management

Generally speaking, China's environmental management in the past 30 years developed with the emergence of industrial pollution and associated environmental damage.

Figure 2 Hierarchy of Environmental Governance in Pollution Control



Source: The authors

The priority of environmental management, especially in the 1970's and 1980's, was industrial pollution prevention and control and, since the 1990's, integrated urban environmental management and ecological protection have been put onto the agenda.

Regulatory arangement

From the 1970's to the early 1980's, governmental policies focused on "three wastes" abatement, a typical end-of-pipe strategy. Neither regulatory nor institutional construction was started. Corporate liabilities for abatement were not well defined. Since the early 1980's, governmental policies were changed fundamentally. A number of policies on environmental management of industries, including comprehensive utilization of resources, technological innovation and environmental investment were formed.

On the basis of "integration of prevention and abatement" strategy, five legal systems were defined for the enforcement of industrial pollution prevention and abatement. These are the system of Environmental Impact Assessment, the System of "Three-Synchronous Requirement", the Pollution Levy System, the System of Deadline Setting for Pollution Abatement and the System of Pollutant Discharge Permits.

In addition, other direct regulations, such as the shut-down policy for small-scale enterprises in fifteen polluting industrial sectors, structural adjustment of industrial layout and the enforcement of emission standards, etc., also played important role in constraining non-compliance.

In contrast to formal regulations, such informal regulations as public participation, information disclosure system and voluntary approach including eco-labeling, cleaner production and ISO 14000 are being implemented as supplements to formal regulations.

Institutional arrangement

The institutional framework consists of five major actors, i.e. the legislative body, the judiciary, the government, the public and industry.

The legislative body is responsible for the construction of legal system for environmental management of industries and conducts supervision over government enforcement.

The government is responsible for policy making, regulatory definition and the enforcement of laws, regulations and policies.

The judiciary is the Court, which is responsible for the judgement of civil lawsuits and administrative lawsuits to guarantee the enforcement of environmental laws and regulations.

The public is the crucial element of social governance. Including citizens, the community, social organizations and the media, etc., the public exerted great influences on the government and on industries.

Industry, in the institutional framework for environmental management of firms, is both the object in terms of being a polluter and the subject in sense of self environmental governance.

Firms and their role

In order to ensure environmental compliance and abide by the liabilities prescribed by the environmental laws and regulations, corporate environmental management has been carried out on both a mandatory basis and voluntary basis. The author made a preliminary assessment of the situation of corporate environmental management in China using five major indicators, including corporate environmental management organization, the qualifications of environmental management personnel, corporate environmental monitoring, installation and operation of abatement facilities, and corporate environmental management regulations.

- Corporate environmental management organization

Generally speaking, on one side, large and medium scale enterprises have special environmental management organizations

called an environmental protection section (division) or safety and environmental protection section (division). This kind of organization, usually under the leadership of a vice manager who is in charge of production/technology, or under the leadership of other divisions, such as production and technique division or manufacturing division, have full-time staff to help the enterprise achieve environmental compliance. Their responsibilities include formulating corporate environmental management regulations, providing technical support, supervising the enforcement of these regulations, working out corporate environmental plans, conducting corporate environmental monitoring, organizing environmental education for staff and conducting corporate environmental statistical work.

In addition to this special organization, full-time or part-time environmental protection staff are assigned in workshops, which are pollution sources. In some large-scale enterprises, staff are necessary for the operation of wastewater treatment plants, dust precipitation facilities and desulphurization facilities. In some large and medium scale enterprises, monitoring stations are established conducting monitoring, sampling and analytical work. In conclusion, an environmental management network (system) is established in most large and medium sized enterprises.

In contrast, small enterprises usually do not have special environmental management organizations. The environmental management in these enterprises is often conducted by another section (division), such as the production/technology section, equipment section or administrative section, etc. A couple of full-time or part-time staff are responsible for corporate environmental management.

- Qualification of corporate environmental management personnel

The qualification of corporate environmental management personnel also varies greatly. In some enterprises, engineers or senior engineers with three-year or four-year higher education in environmental engineering are employed as corporate environmental management staff. For the operation of abatement facilities, technical workers are required by some enterprises. However, in some other enterprises, corporate environmental management staff, who are not educated in environmental engineering or relevant subjects, may be only high-school graduates or even lower. These staffs are not qualified for corporate environmental management. To date, there is no law (regulation) prescribing the requirements for qualifications of corporate environmental management personnel, nor for the qualification of staff who work in abatement facility operations.

- Corporate environmental monitoring

Prescribed by relevant environmental regulations, as well as required by local environmental protection bureaus, corporate environmental monitoring is often conducted either by enterprises themselves or entrusted qualified organizations. The frequency of corporate environmental monitoring varies greatly. Some may conduct environmental monitoring once a month, while others may conduct it twice a year. Some enterprises even formulate adequate corporate environmental monitoring regulations, defining the responsibilities of monitoring staff, items to be monitored, the frequency and procedure of monitoring, technical specifications and norms, recording, management of documents, and verification of monitoring results, etc.

- Installation and operation of abatement facilities

Most industrial enterprises installed abatement facilities required by the System of "Three-synchronous Requirements" for new and expansion construction projects and the System of Deadline Setting for Pollution Abatement of existing enterprises. Though most major industrial enterprises achieved

environmental compliance in 2000 after the national action plan of environmental compliance of all industrial enterprises was carried out in the period of the Ninth Five-year Plan, the efficiency of abatement varies from one enterprise to another. Some enterprises employ tertiary wastewater treatment and a high rate of recycling and realize zero discharge while others simply use sedimentation tanks. The abatement facilities in some enterprises is operated normally year round, but in some other enterprises the abatement facilities may be stopped.

The cost of operation of abatement facilities is usually affordable by enterprises, however, the investment needed for the installation and construction work, usually not eligible for financial assistance from commercial banks, is a great challenge to enterprises.

- Corporate environmental management regulations

In order to achieve environmental compliance and make regular corporate environmental management possible, enterprises usually formulate various regulations, including goal-responsibility systems for environmental protection, post-responsibility systems, integration of abatement facility into equipment management, corporate environmental management criteria, maintenance of abatement facility, environmental monitoring, environmental statistics, management of documents, and awards and punishment, etc. These corporate regulations are supervised by corporate environmental management staff.

4.2.3 The Roles of Citizens, Media and NGOs in Environmental Governance

The public, civil societies, NGOs and representatives of special groups such as the NPC and the National People's Political Consulting Congress (NPPCC) are exerting an increasingly influence on the Chinese agenda of environmental governance. Nowadays, China sees the roles of the public and civil societies as well as NGOs in environmental governance in several aspects: voluntary actions to protect the environment, monitoring and publicizing behaviors polluting and damaging the environment, protection of their environmental interests deprived by polluters, and participation in policymaking.

The 1996 State Council's Decision on some Issues of Environmental Protection stressed that the public participation mechanism shall be set up, in order to bring the role of the public and social groups into play. The State Council Decision also encourages public participation in environmental protection in ways such as reporting and exposing various behaviors violating environmental laws and regulations. The Law of Environmental Protection also stipulates that all organizations and individuals share responsibilities for environmental protection and have the right to report and condemn organizations and individuals who pollute or damage the environment. The 2000 revised Law of Water Pollution Prevention and Control added special articles that the environmental impact assessment process for new construction projects shall consider comments of local organizations and residents in the location of the project assessed.

For behavior polluting or damaging the environment, the social groups and citizens can generally adopt approaches such as negotiation with responsible parties for promptly stopping the behavior, reporting to the mass media for disclosure and to administrative organizations for application of regulatory measures or mediation, and even filing lawsuits. Normally, the public prefers to choose an administrative approach to voicing through complaints or suggestion letters or direct visits. At present, there are more than a hundred thousand letters and proposals on environmental matters on the desks of environmental administration nationwide each year.

The government encourages the pub-

lic interests at environmental affairs through various measures. Of particular significance is information disclosure. At present, three kinds of environmental information are accessible to the public: annual environmental status bulletins; annual reviews of urban environmental performance of 600 cities around the country; and daily air quality indicators in 46 key cities.

The media is another important actor to monitor environmental performance by industries and government bodies. The publicizing of environmental problems and noncompliance of industries as well as the lack of or inappropriate administration can help attract or push governments and industries to respond to the problems. At the same time, the mass media is the best venue to educate the public. At present, environmental protection-related reports and news are one of the hot topics in the Chinese mass media. For example, the Chinese Central TV has developed several popular programs, such as the New Environmental Protection Express, the Nature and Humans, etc. In order to bring the monitoring role by the mass media into full play and raise public environmental awareness, SEPA and the Committee of Environment and Natural Resources Protection under the NPC, jointly launched the Tour of Chinese Environmental Protection Century in 1993. More than 750 news agencies from the national and local media were involved in the Tour. After the 1993 initiatives, the tours on different environmental topics continued for several years. More than 6,000 reporters participated in the tours and over 48,000 reports were publicized in the media.

4.3 The Sino-Japan Center: A Case of Sino-Japan Bilateral Cooperation

4.3.1 Introduction of the Sino-Japan Center

The Sino-Japan Friendship Center for Environmental Protection (briefly called the "Sino-Japan Center") was the fruit of Sino-Japan bilateral environmental cooperation. It was constructed with the grant aid of 10.5 billion Japanese yen provided by the Japanese Government and funding of 66.3 million RMB raised by the Chinese Government. The construction work started in 1992 and finished in May of 1996. In the last six years, the bilateral environmental cooperation through the Sino-Japan Center has produced fruitful achievements and in turn helps the Center gradually form capabilities and play an active and important role in China's environmental protection work.

The Sino-Japan Center consists of several sub-divisions, including the Department of Environmental Information, Department of Environmental Strategy and Policy Research, Department of Environmental Technology Exchange and Public Education, Open Laboratory, Department of Pollution Prevention and Control Technology, Department of Environmental Monitoring Technology, Institute of Reference Materials, the Secretariat of China Accreditation Committee for EMS Certification Bodies, the Secretariat of China Registration Committee for Environmental Auditors, Sino-Japan Environmental Cooperation Project Office and Waste Import Registration and Management Center.

4.3.2 Specific Technical Cooperation

Dating back to 1992, the Japan International Cooperation Agency (JICA) initiated Phase I Technical Cooperation in collaboration with SEPA in order to foster qualified technical personnel and provide technical support to the Sino-Japan Center which was under construction. JICA and SEPA co-sponsored Phase I environmental technical cooperation. Three long-term Japanese experts and another eleven Japanese experts were invited to the Center for short-term technical exchanges. During the period of construction, twelve cooperative activities focusing on technical personnel training were imple-

mented. The Center also received equipment worth of 75 million yen aided by the Japanese Government. Agreed upon by the two sides, several cooperative research works were also started, including research on yellow sandstorms.

The technical cooperation in Phase I achieved expected results in that qualified staff were in place through the implementation of many cooperative projects, which formed a solid basis for future operation of the Center.

To support the implementation of many tasks of the Center after its foundation in 1996, SEPA and JICA signed an agreement on Phase II Technical Cooperation. During five-year cooperation in Phase II, the Japanese Government dispatched 19 Japanese experts for long-term and 52 experts for short-term exchange. Moreover, the Japanese side provided technical equipment worth 125 million yen. The Sino-Japan Center dispatched 29 staff to Japan for technical training. 74 cooperative projects were initiated and produced good research results. In summary, the technical cooperation in Phase II played an important role in building up the capacities of the Center in many fields, while each sub-division of the Center developed rapidly through a variety of cooperative projects.

The growth of the Sino-Japan Center greatly benefited from technical cooperation, which has become a successful model for bilateral cooperation in the environmental field and received highly praise from both governments. Three Japanese experts were awarded the honorable "Friendship Award" by the Chinese Government.

In recognition that bilateral environmental cooperation should be long-term, especially on some serious environmental issues and in addition, that the Sino-Japan Center played an important role in linking both countries in the field of environmental cooperation as expected by both nations, SEPA and JICA signed a memorandum for Phase III Technical Cooperation. The technical cooperation in Phase III started from April of 2002 and will continue till March of 2006, covering four areas with eleven projects. The Japanese Government will provide a total of 120 million yen for research expenditure (including budget for Japanese experts) and 100 million yen for technical equipment and facilities. The first area is air pollution control, including research on the prevention of acid rain, yellow sand (sandstorm) issues, and particulate issues. The second area is environmental management capacity building, including the promotion of ISO 14000, study on Japanese Industrial Pollution Control Manager System, and training programs for local EPB's officials. The third area is the study of dioxins and other new threatening chemicals, including hormones. The fourth area is environmental protection in the development of the west part of China, including environmental management capacity building in the west part of China, environmental policy research and recommendations, and the establishment of an information system of the ecological environment.

4.3.3 Good Experiences

The Sino-Japan Center has played a positive role in building up China's SEMS in various ways since its establishment (see Table 6). In addition, the Sino-Japan Center has also accumulated a great deal of experience in bilateral cooperation and international cooperation through 10-year practices.

Demand-oriented cooperation

All projects in Sino-Japan technical cooperation (Phases I, II, and III) are selected according to the demands of the Chinese side. After Chinese researchers raised project proposals for technical cooperation, environmental experts from both countries discussed carefully and screened for appropriate projects. 128 sub-projects supported by the Japanese-yen loan were also determined according to the Chinese situation and demands

Table 6 Roles of the Sino-Japan Friendship Center for Environmental Protection in China's Social Environmental Management System

Target Actor	Roles of the Sino-Japan Center	Different Aspect	Example
The Government	Support to SEPA	(1) Direct participation in SEPA's important work	Provision of technical support to the negotiations of MEA; organizer of important conferences and activities for SEPA; participation in the disseminating and reporting of significant activities
		(2) Promotion role in the improvement of state laws, regulations and standards	The Institute of Reference Materials has completed 227 national reference materials which are widely applied in environmental monitoring and enforcement.
		(3) Provision of technical support to environmental policy making	Research on the indicators of sustainable development; research on the integration of environmental concerns into the economic decision making process; research on environmental strategy; research on yellow sands and sandstorms; national dioxin laboratory
		(4) Promotion to the SEMS	Construction of a LAN for the Information Center of SEPA; satellite communication private network for SEPA; e-mail system for the national environmental information intranet and the environmental information network of China
	Support to local environmental management	(1) Strengthening the capacity of local governments	Environmental information network construction in 100 Chinese urban areas; training courses for directors of urban EPBs; training courses for directors of provincial EPBs; training courses on environmental information systems
		(2) Technical support to local EPBs	Information technical support;monitoring technical support
		(3) Joint research with local EPBs	PM_{10} source identification for Guangzhou City
		(4) Promotion of international cooperation for local EPBs	Overseas training and investigation; bilateral or international cooperation projects; coordination of Sino-Japan model city project
The Public		(1) Construction and maintenance of environmental websites	www.zhb.gov.cn
		(2) Information disclosure via the media, TV and broadcasting	TV program production; radio program production; establishment of the Environmental Educational TV and Programme Center open to the public
		(3) Promotion of public environmental education	Promotion of the Green School activities; publishing the book "Green Cradle"
		(4) Promotion of public environmental awareness	Organizing activities such as waste paper and waste plastic package collection and recycling; promotion of "green office"
The Firms		(1) Promotion training of personnel	Corporate environmental personnel training
		(2) Technical consultation	
		(3) EMS consultation	ISO 14000 certification and personnel accreditation; ISO 14000 enforcement training

Source: The authors

from the Chinese side.

Mutually promoted cooperation

The Sino-Japan environmental cooperation has continued on a friendly and sincere partnership basis. In the process of project screening, experts from both countries provided their own ideas and suggestions based on China's environmental policies and environmental issues, as well as major environmental programs initiated by the Chinese Government.

Comprehensive and all-sided functions

The institutional composition of the Sino-Japan Center indicates that its function is not positioned to just one aspect of environmental protection but to comprehensive functions including scientific research, publicity and education, information networks, supervisory services, international exchanges and so on. As a result, its functions in the SEMS are also comprehensive and so is its influence, which extends to government, enterprises and the public.

Such comprehensiveness and all-sidednedd is manifested not only by its effective support of decision-making, technical and information services, and capability building of the State Environmental Protection Administration, but also by its promotion of the work of the local environmental protection bureaus, its positive influence on the awareness of the public and enterprises for environmental protection.

Adoption of proper operation mechanisms

The establishment of the Sino-Japan Center coincided with the start of the structural reorganization of science and technology institutions in China and faced the approaching reform of state-funded research institutes.

Under these circumstances, the Center adopted internal incentive mechanisms by implementing the target responsibility system. It distributed annual targets to each unit which was tested for its performance in accordance with the fulfillment of these targets at the end of the year, thus greatly stimulating the enthusiasm of each unit.

Opening cooperation

In terms of the Sino-Japan environmental cooperation, the Sino-Japan Friendship Center for Environmental Protection established partnerships and carried out various cooperative activities with the Japanese government, non-governmental organizations, many universities, research institutions and civil groups in Japan. In addition, the Sino-Japan Center has also developed extensive cooperation with other countries besides Japan.

(Zhou Xin, Ren Yong, Gao Tong)

Note:

1. Institute for Global Environmental Strategies (IGES), Environmental Governance in Four Asian Countries, IGES Environmental Governance Project, June 1999.

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Chapter 5

Social Capacity Development for Environmental Management and Japan's Cooperation in Thailand

5.1 Social Capacity Development for Environmental Management

Environmental operations undertaken in the past started from policy and plan formulation through implementation by applying command and control measures on polluters, forcing them to comply with standards. As the population increased as well as business activities and popular activities, command and control measures became limited by monitoring and inspecting personnel as well as by operating budget, etc. Economic instruments, therefore, have been used to manage pollution voluntarily and have become an alternative for polluters in managing their own pollution.

In addition, voluntary operation such as ISO 14000, Green Label, and Clean Technology have become other means of management of natural resources and the environment as a market has been created stimulated by consumers' demand. International market pressure and international measures also forced exporters to comply with various trade conditions employing environmental measures as requirements for imported goods standards.

At present, the Government has begun to transfer authority to localities by providing them with more roles in the management of natural resources and the environment. The organizations of the locality are to formulate plans for the rehabilitation and protection of natural resources and the environment, assessment of environmental quality, monitoring of water quality, and rehabilitation of coastal conditions, for example.

All these policies, measures, instruments, and plans, reflect the awareness of the government sector and the public relating to the conservation of natural resources and the environment. Thailand is still in need of technologies and experts, as well as personnel development to support her management of natural resources and the environment in the future.

Important instruments related to social capacity development for environmental management are as follows.

5.1.1 Command and Control

During the past 20 years, environmental problems were perceived as a cause of the country's economic and social development hindrance. To prevent natural resources and the environment from further degradation, a command and control system has been utilized to regulate and reduce negative environmental impacts. Experience from the past proved that the Command and Control system did not attract or drive pollution point sources or people toward cooperation in pollution reduction and thus the environment became more deteriorated and natural resources increasingly degenerated. This is because the Command and Control system requires (1) Constant monitoring and penalization thus resulting in large expenditure while the country, at the same time, needs development in other areas such as education, poverty, and infrastructure development; (2) the Command and Control system requires competent officials for inspection and requires more operating budget; (3) Light penalties are not effective enough to change production and consumption behavior; (4) Some sorts of pollution point sources have been in operation for a long period of time and are in great number, employing old technologies, being small family businesses, having low investment, operating in limited areas before enforcement of law and regulations on standards; and compliance with standards is

therefore not possible; (5) Each point source has more than one type of environmental problem, enforcement of environmental standards forces the business to improve its production to reduce pollution, not only is it required to spend a large sum of money but it is also required to spend more to eliminate other types of pollution, for example, upon complying with wastewater treatment standards, a factory is faced with air pollution problems which requires a second production improvement to resolve such problems.

5.1.2 Economic Instruments

In order to increase the efficiency of the management of pollution and natural resources and to induce motivation for cooperation through more willingness than the Command and Control means, studies and research were conducted in 1990 to employ economic instruments in the management of natural resources and the environment[1]. At present, economic instruments are employed in the management of pollution and in the conservation of natural resources in Thailand. However, effective employment of economic instruments should be used together with the Command and Control measures as the environmental standards will require polluters to comply. They would choose between the management of environment by voluntary reduction of pollution and enforcement of the law and regulations in case pollution discharge does not meet the standards. Making such a decision, the polluters would have to take into account the investment, fund availability , and future growth of their business.

For localities, even though economic instruments are ready to be employed by means of local ordinances such as collection of wastewater treatment fees or fees for management of garbage, relatively few locations are employing such instruments as local politicians are afraid of losing elections. Another reason making economic instruments inefficient is the fact that the fees do not represent real management cost although they have been collected for many years such as water supply charges and garbage management fees.

5.1.3 Voluntary Approach

Voluntary reduction of pollution is another approach of environmental management controlling pollution created by production and consumption activities under standards, or preventing pollution voluntarily. This approach is sustainable and what has been carried out in Thailand is as follows:

ISO 14000: The first ISO 14000 certification in Thailand was awarded in 1996[2]. At present there are 628 establishments certified under this standard. There are 37 ISO 14000 consultancies and 14 ISO certification bodies[3]. Problems and obstacles in setting up of environmental management standards of Thailand are:

1) Lack of information on follow-up and evaluation as environmental projects such as alleviation of the effects of pollution and waste materials require follow-up and evaluation. Information obtained shall be genuine and must be used as a base for decision making and to bring about real solution to problems. Thailand's industrial sector lacks a sound information keeping and collection system.
2) Unclear goals set by high level executives. ISO 14000 requires clear environmental goals and objectives to guide the organization and its personnel in the right direction. Such goals should be realistic and flexible.
3) Lack of support or attention from high level executives resulting in the organization failing to reach its goal, for example, no support regarding financing, resources and technologies, or personnel, thus resulting in failure.
4) Members of the organization lack aware-

ness, thus no cooperation is realized.

Green Label: Thailand is using "Green Label" to certify products having less impact on the environment than other products of the same nature[4]. Thailand Business Council for Sustainable Development initiated the Green Label project in 1993 which came into existence through cooperation between the government, the private sector and other organizations. The Council includes the Secretariat, the Office of the Thailand Industrial Standards and the Thailand Environment Institute. Application for a Green Label is a manufacturer's arbitrary choice and not required by law or regulation. Presently, requirements providing conditions to obtain a Green Label are set for 33 products.

Cleaner Production: Clean technology has been used as an instrument in creating sustainable efficiency and development[5]. Problems and obstacles in using clean technology in Thailand are as follows:

1) Business operators do not understand the concept of clean technology thus creating problems in cooperation in the improvement of production process.
2) Personnel of the organization do not participate. As clean technology requires changes in production behaviour, cooperation from all personnel involved in production is required.
3) Lack of information. Planning for improvement of production requires information on usage of water, energy, and quantity of waste from production processes, in order to reduce loss and waste. Such information is important in the planning and assessment of success of the project operation.
4) Lack of technology both for personnel knowledge and for the development of material, equipment, tools, and machinery regarding the environment. This is because production processes for each product are different. Even for the same product in different factory, the process is also different due to the difference in size and type of machinery. It is difficult to prescribe specific technology and therefore specifying clean technology is also difficult.
5) There are not many successful concrete examples of clean technology as the evaluation of loss and waste reduced by it in terms of money is difficult.
6) Disclosure of successful clean technology is not widely made as improvements in clean technology are made in production processes which are considered trade secrets.
7) There are not many people who have clean technology knowledge and therefore clean technology promotion can not be disseminated widely.

5.1.4 Consumers' Pressure on the Market

Consumers are the most important factor to drive the environmental-friendly products. In Thailand many activities are set up to empower consumers, examples in this case are:

Hygienic Meat: In 2001, the Ministry of Public Health persuaded the public to buy fresh meat from department stores bearing a hygienic meat logo to create popularity for hygienically slaughtered meat, cutting, and packaging.

Hazardous-substance-free Vegetables: Many years of implementation brought about popularity from consumers. At present, hazardous-substance-free vegetables are available at every department store and in some local markets.

No. 5 Power Saving Appliances: The Electricity Generating Authority of Thailand initiated a program encouraging the public to choose power saving electric appliances by is-

suing the No. 5 Power Saving logo to all appliances joining the program. The public is therefore becoming the main force in pressing manufacturers to improve their production to achieve power saving status.

Energy Knowledge Campaign: The Energy Policy and Planning Office (EPPO), one of the government agencies, spent 200-300 million baht in providing the public with knowledge concerning energy in its highly successful "Divided by Two" campaign. Apart from providing knowledge concerning energy, it also advises the public how to choose power saving appliances such as "Thin fluorescent lights".

5.1.5 Pressure from International Markets and Measures

Standard Farm: Porcine farms in Thailand were pressured by exporters insisting they would purchase pork only from standard farms. In 2001, there were over 100 standard porcine farms all of which were large scale farms. (There were over 11,500 commercial scale porcine farms all over Thailand in 1999.[6])

Waste Electrical and Electronic Equipment (WEEE): This measure shall come into force in 2004 and is expected to affect manufacturers who export electrical and electronic products to the European Union. They are required to (1) comply with regulations requiring them to bring scrap back into the country thus incurring expense. (2) Thailand's manufacturers and exporters are required to adjust their production to comply with regulations such as product design or choice of raw material to use so that they can bring the scrap back at the rate specified by the regulations. It is expected that domestic waste management will become more systematic and more efficient. (3) If hazardous heavy metal is banned in 2008, direction of management or formulation of policy for the management of domestic industrial waste will be directly affected. Thailand is required to devise strategies for the prevention and solution of problems caused by the use of new substance in the country's industrial sector.

Measures for Reduction and Discontinuation of Use of Ozone Layer Depleting Substances in Thailand: The Montreal Protocol on Substances that Deplete the Ozone Layer is an international agreement in furtherance of the Vienna Convention. Its objective is to put a stop to the destruction of the ozone layer by means of reducing and discontinuing the use of ozone layer depleting substances. Thailand has been a member party since October 5, 1989. Presently, it is not the time for Thailand to stop using the substances according to the Protocol as the consumption is less than 0.3 kilograms per capita and is permitted to use the same when necessary. In fact, CFC use in some areas has been reduced significantly reflecting the public awareness of the significance of information as well as awareness of environmental measures.

5.1.6 Roles of Local Bodies

The Government has transferred, promoted, and provided more roles in the management of environment and natural resources to local bodies and related organizations.

Preparation of Environmental Operation Plan: Organizations of local bodies are required to prepare an environmental operation plan and submit it to the Ministry of Science, Technology, and Environment[7] for approval and for budget allocation. Although the quality of such plans are not usually good enough as they focus more on investment in pollution problem-solving than conservation and prevention of loss or replenishment of natural resources, it is the starting point for organizations of local bodies to pay attention to the environment and natural resources in their area.

Preparation of Environmental Impact Assessment: Every EIA project is required to hold public hearings to give the local people an opportunity to become aware of the development to take place in their area. They will be given opportunity to query and express opinions on the project including on impact reducing measures and environmental quality monitoring measures.

River and Stream Investigation for Youths is a project implemented by an NGO under financial support from the Danish government. The project designates schools as controlling centers to monitor water quality in water resources in the northern region of Thailand through communities via young students. Simple local knowledge is distributed among young students teaching them ecological systems that indicate various levels of water quality and ecology at different levels. This concept has presently been adapted to various rivers and to other areas of environmental problems.

Mab Ta Put Bad Odor Problem: Mab Ta Put is an area in the Eastern Coast of Thailand which came under industrial promotion in 1989. During the past 5 years, communities in the vicinities suffered from bad odors from a petrochemical factory and factories engaging in related industries. The problem has now been alleviated by various measures and one of which was the preparation of monthly reports which were submitted to a tripartite conference consisting of the state, private sector, and the community. The mass media was also invited to observe.

5.2 Japan's Cooperation for Environmental Management in Thailand (in case of supporting of the Environmental Research and Training Center)

Since 1980, Thailand and Japan have been involved in a joint project called the Control of Environmental Quality and Laboratory Technology Project. The purpose of this project was to identify effective means of promoting pollution control activities, to reinforce the function of environmental laboratory services at the national level, and to organize a system of research related to environmental pollution and its control.

The success of the initial collaboration between Thailand and Japan led to proposals for the establishment of the Environmental Research and Training Center (ERTC) in 1983. The Government of Japan agreed to support the establishment of ERTC with a grant of 2,314 million yen, which at that time was equivalent to 463 million baht. It was agreed that the Government of Thailand would take responsibility for land preparation, construction of access roads and fences, installation of electricity, telephones and water supply to the site. The ERTC subsequently commenced operations in November 1991.

ERTC is under the overall jurisdiction of the Department of Environmental Quality Promotion (DEQP), Ministry of Science, Technology and Environment which was transferred to the Ministry of Natural Resources and Environment in 2002. ERTC is also the center of the ASEAN network of environmental monitoring.

Objectives of setting up ERTC:

1) Formulation of plans for the development of programs in training, conferences, or academic seminars concerning environmental technology;
2) Undertaking of research and development for monitoring methods in monitoring and checking environmental quality and coordination in international environmental checking cooperation programs;
3) Undertaking of research and development for appropriate technology for pollution control including research and development for recycling tech-

niques and appropriate eradication;
4) Undertaking of research and development for environmental sample analytical methodology including production of standard references as well as giving advice on the use of scientific instruments and on environmental sample analytical methodology to agencies concerned;
5) Coordination in accuracy verification of information and data concerning pollution conditions from laboratories among agencies; and
6) Carrying out work in conjunction with or in support of the operation of other agencies concerned or as being assigned to it.

ERTC is divided into 4 work groups as follows:

1) General Administration Work Group
2) Environmental Technology Transfer Work Group: Training Section: ERTC has developed training programs on the environment with the cooperation of experts from Japan and Kasetsart University. A United Studies Graduate Education Project on Science and Environment was set up in 1992 and its curriculum has been used as the basis for training. Up to 2002, 5,027 people have completed ERTC. The Conference and Seminar Sub-section is under the Training Section. Seminar topics selected were those currently significant. The seminars were organized to also disseminate various research works of the Research and Development Work Group of the Center.
3) Environmental Research and Technology Development Work Group: This research work group is divided into 3 sections: (1) Water Research and Technology Development Section, (2) Air, Noise and Vibration Research and Technology Development Section and (3) Hazardous Substance Research and Technology Development Section
4) Environmental Standardization Work Group: The Environmental Standardization Group is responsible for the provision of standard methodology to analyze environmental samples, including standard reference materials. It coordinates the inter-calibration of environmental data among laboratories and assesses the accuracy and reliability of data. It provides recommendations for improvement, helps to ensure the quality of data in the laboratories, and certifies laboratories. This group consists of 3 Sub-sections: 1) Testing and Auditing Sub-section, 2) Standardization Development Sub-section, and 3) Statistics and Evaluation Sub-section.

Based on support from the Government of Japan through the Japan International Cooperation Agency (JICA), we can classify into two phases, there are Phase I: with partial support from JICA and Phase II: without support from JICA

Phase I: With Partial Support from JICA (during 1991-1996)[8]

During 1991-1996, ERTC received technical cooperation from JICA, which provided Japanese experts, machinery, equipment and other materials, as well as capacity build-up training for ERTC officials in Japan. In addition, the grant as provided by the Government of Japan included ERTC's office construction. There are 2 main buildings constructed with reinforced concrete. Each building has 3 storeys with connecting corridors. The analysis of the grant received from JICA during the first 5 years revealed that the effects of JICA's assistance since the Center's inception to 1996 are as follows:

1) Machinery, Equipment and Materials: Most of the machinery/equipment received from JICA under the cooperation since ERTC's inception was old and out of date. Another important problem was that the scale precision of some of

the machinery/equipment was insufficient to measure Thailand's pollution.

2) Technicians: Initially, JICA's assistance granted was one-sided. JICA's experts transferred their know-how to the Center's researchers but there was no joint implementation. Thus, there initially were gaps between the skills of JICA's experts and those of the Center's officials. Last point in this issue concerned technicians supported by JICA who were commissioned for a short-term period and thus the time needed for exchange of knowledge was insufficient. Technician assistance in the future should be long-term.
3) Building: The building which was constructed financially by JICA's assistance was more suitable for laboratories than offices thus making office arrangements difficult. Therefore, some offices have been affected by substances evaporating from the laboratories.

Phase II: Without Support from JICA (during 1997-present)[9]

The operating budget of the Center since its inception to present was received mainly from the Thai Government. The largest portion of such budget was allocated for research work and next in importance is for training. In 2003, 20% of the total budget was allocated for research work while 12.4% for training (Table 1).

Table 1 Budget of the Environmental Research and Training Center

Year	Total Budget (Million baht)	For Research Work		For Training	
		Million baht	%	Million baht	%
1992	11.6	0.2	2.1	0.2	1.72
1993	20.4	7.5	36.8	0.3	1.72
1994	25.6	7.5	29.2	0.7	2.73
1995	41.3	5.0	12.1	7.9	19.0
1996	51.5	5.0	8.2	9.6	15.7
1997	53.8	8.4	15.7	7.0	13.0
1998	40.2	2.0	4.9	1.1	2.8
1999	39.5	1.8	4.6	1.1	2.9
2000	70.4	7.2	10.3	0.9	1.4
2001	55.0	7.9	14.4	1.1	2.0
2002	49.8	6.9	13.8	3.0	6.0
2003	85.5	17.1	20.0	10.6	12.4
1992-2003 Average		6.9	15.6	3.9	7.3

Note: 1 US$ = 43.04 Baht and 1 yen = 0.36 Baht
Source: Environmental Research and Training Center, 2002.

Since JICA withdrew its assistance in 1996, ERTC requested assistance for its research work from other organizations such as the Swedish International Development Agency (SIDA), Danish Cooperation for Environment and Development (DANCED), United Nations University (UNU), United States-Asia Partnership (US-AEP), Green Aids Plan, World Bank, Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ), GmbH, and United Nations Environment Programme (UNEP). A large part of the assistance was in the form of supplying experts, equipment, training and partial financial support for research work.

Assistance from various organizations together with the Center's policy to develop the capacity of its personnel has given the Center's research personnel continual development and training whose research skills match those of overseas researchers. As ERTC has planned to become the center for Thailand's environmental research and training and to set up laboratory standards as well as giving advice to agencies nationwide, the government's assistance alone would not achieve the Center's objectives. The Center is still in need of assistance from foreign organizations especially for personnel development and research support in the form of exchange programs, on-the-job training, or network construction.

The assistance the Center needs from JICA is a program for the exchange of knowledge, equipment, and resources among the 6 environmental research and training centers (Thailand, China, Indonesia, Mexico, Chile, and Egypt). This can be achieved by the setting up of a joint committee holding meetings annually with the rotating chair-country undertaking joint research work to exchange experience in order to strengthen the Center

of each participating country.

5.3 Role of ERTC in Environmental Management

During the past ten years, ERTC undertook over 40 research works regarding water, air, and toxic substances. Ten to thirteen training programs were given annually with more than 5,000 participants from central and regional agencies, private organizations, academic institutions, etc., since its inception to 2002. The criteria to analyze importance of the Center towards the government sector, market, and community are as follows:

5.3.1 Relevance of the Project Training[10]

Training topics would be major environmental issue at the time or as mainly requested by would be training participants. Several topics were given more than once such as environmental studies, garbage management, and eco-tourism management. In addition, some of the training topics were suitable for participants to implement in their daily life, for example, individual participation in environmental management, suitable technology for the management of community waste, and how to resolve conflicts in public projects. Individual participation in environment programs would help forming the people's environmental knowledge base as well as environmental awareness and monitoring while community waste management and conflict resolution would be useful for management of community environments and resolving social problem concerning the environment.
Table 1 reveals that (1) the government budget allocated to training is 2,100 baht per person on average while private sector training cost 2,500 per person per day, or 10,000 - 30,000 baht per training; (2) the amount of government budget for training is not the same every year and neither is it on an increasing nor decreasing trend. It depends on ERTC's request and on the government allocation. The budget could be categorized into three groups as follows:

1) Small budget: 0.2 -1.1 million baht annually
2) Medium budget: 3.0 million baht annually
3) Large budget: 7.8 -10.0 million baht annually

The above statement reveals that (1) the budget allocated to ERTC and the money collected from training participants are operating expenses, not including cost of investment. (2) Training personnel may have worked under capacity in some years and over capacity in others. (3) Budget variation of this nature makes planning for operation and training personnel development difficult.

Research

Research topics were knowledge enhancing and can be implemented in environmental management such as Study on Health Effects of Noise to the People in Bangkok, Study on Lead Residue from Battery Factory in Pathumthani Province Using Hair Samples, and Research on Environmental Impacts of Volatile Organic Compounds (VOCs) Contaminated Groundwater in the Area of Northern Industrial Estate, Lampoon Province, etc.[11]

In addition, some of the research topics were presentation of impacts that had take place which led to the country's setting up of environment standards, for example, Technique for Investigation of VOCs Contamination in Soil and Groundwater which led to the setting up of VOCs standards by the Industrial Estate Authority of Thailand having listed the topic in its operation plan to solve groundwater contamination problems. As the problems also affect Thailand's air quality, ERTC also conducted related research on Air Pollution in Bangkok Emphasis on Volatile Organic Compounds.

5.3.2 Efficiency of the Project

Efficiency is measured by personnel development and the number of personnel increase in Research Work Group and Training Work Group from the Center's inception. Details of personnel structure of ERTC are as Table 2.

According to Table 2, there are 120 research and training staff members. 55 persons or 46% are government officials, 9 are permanent employees and 56 are temporary employees, or 7% and 47%, respectively. Rate of increase in number of staff members during 1992 through 2002 for government officials is minimal (Figure 1 and Table 3) thus making ERTC's personnel development moving horizontally meaning development mainly had effects on officials and permanent employees. This is due to the government policy of not increasing the number of government officials which could cause problems to the Center in the future as present officials would be promoted to executive levels and there could be shortage of staff members at operation levels.

Another problem of the Center is that training of research and training staff members requires continuity so as to make them experts. However, 50% of them are temporary employees who would leave the Center after they have completed training. Because of no employment policy for permanent employees or officials, the Center is always in need of assistance regarding experts and it is forced to rely on outside resource persons for training. The Center has no potential with regard to its personnel development to accommodate future expansion of the training work group.

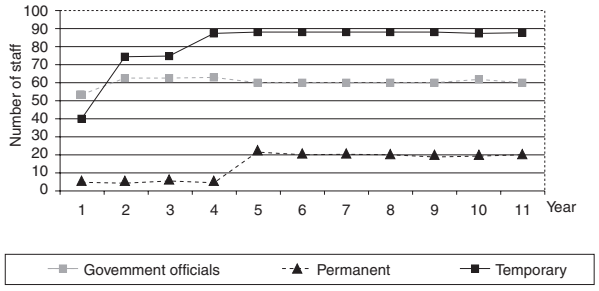
Comparing the number of training participants to the number of training staff members, changes during 1992-1999 were in the same direction. However, from 1999 to present, the number of training staff members remained the same while the number of training participants increased in 2000-2002. And the Center employed more outside resource persons such as personnel from academic institutions or environmental agencies as most of the training programs deal with administration and management of natural resources and the environment, it is not really necessary to employ many technical resource persons (Figure. 2).

Table 2 Number of Personnel of ERTC in 2002

Work Group	Officials	Permanent Employees	Temporary Employees	Total
Environmental Technology Research and Development				
- Hazardous Substances	11	2	10	23
- Air and Noise	12	2	13	27
- Water	11	1	9	21
Technology Transfer	12	2	14	28
Environmental Standards	9	2	10	21
Total	*55*	*9*	*56*	*120*

Source: Primary data from ERTC

Figure 1 Number of ERTC Employees Classified by Employment Status between 1st Year and 11th Year



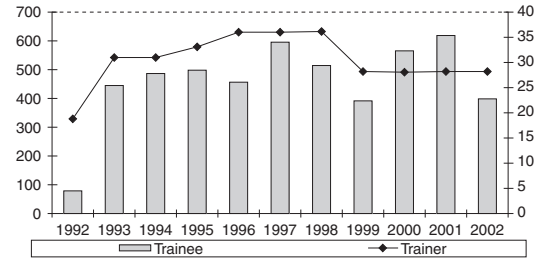
Source: Primary data from ERTC

Table 3 Number of ERTC Officers, Classified by Type of Employment

Year	Government official			Permanent Staff			Temporary Staff			Total
	Research Group	Training Group	Other	Research Group	Training Group	Other	Research Group	Training Group	Other	
1992	29	7	17	1	0	4	14	12	14	98
1993	29	12	22	1	0	4	13	19	43	143
1994	29	12	22	1	0	4	13	19	43	143
1995	29	12	22	1	0	4	17	21	50	156
1996	35	12	14	6	2	13	39	22	27	170
1997	35	12	14	6	2	13	39	22	27	170
1998	35	12	14	6	2	13	39	22	27	170
1999	35	12	14	6	2	12	32	14	42	169
2000	35	12	14	5	2	12	32	14	42	168
2001	35	12	14	5	2	12	31	14	42	167
2002	34	12	14	5	2	12	31	14	42	166

Source: Primary data from ERTC

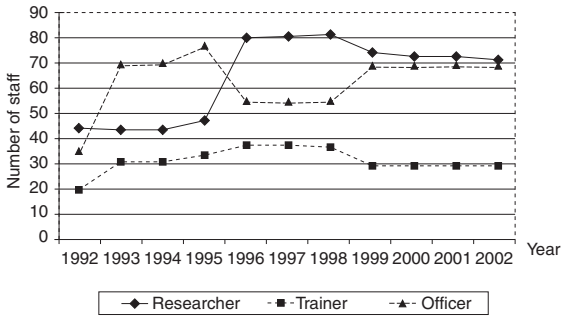
Figure 2 Number of Trainees and Trainers between 1992 and 2002



Source: Primary data from ERTC

Unit: persons

Figure 3 Number of ERTC Officers Classified by Work Group



Source: Primary data from ERTC

However, as mentioned above, ERTC is still in need of personnel development in training to accommodate its future training programs in order to rely less on outside resources and especially to increase the potential of its personnel to achieve the status of being a principal training center for natural resources and the environment of Thailand.

The analysis of research work efficiency conducted by comparing research work quantity to the number of the Center's researchers reveals that the average rate of production of research work of the three work groups (water, air and noise, and waste) is 5 projects a year. The number or researchers which was increased by a big leap in 1996 was constant from 1996 to 1998 and was reduced slightly during 1999 through 2002 (Figure. 3). The number of projects was reduced to 2 a year in 1999, increased to 4 a year during 2000 through 2002 as they were 2-3 year projects in progress.

In summary, ERTC has efficiently disseminated knowledge of natural resources and the environment to the government sector, market and society. This is evidenced by the number of participants in training, the number of training staff members, and the number of researchers which are all increasing. It should be noted that 64% of the training participants being government officials who would apply what they received from the training to the management of natural resources and environment with which they involved.

5.3.3 Effectiveness

Effectiveness of the ERTC is measured by the benefits and concrete application of research work and training programs. Assessment was made by interviewing technicians and officials of the Ministry of Science, Technology, and Environment by questionnaires requesting opinions on the roles of the Center towards the Ministry personnel, opinions on the importance and advantages of the Center, and the opinion of former training participants of ERTC regarding the benefits they gained, and the opinion toward ERTC's development and its future pattern. The outcome is as follows:

The Ministry of Science, Technology, and Environment's Personnel

The interview of 50 samples of the Ministry of Science, Technology and Environment's personnel reveals that 76% of the interviewed samples knew ERTC as an agency under the Ministry while 24% did not have that knowledge. 82% of the personnel who knew ERTC knew of its roles and duties. 68% of the personnel who knew ERTC worked in connection with it. 3% worked closely. However, 21% of this group did not know that ERTC carried out environmental research. The majority of the personnel knew ERTC through its environmental training/seminars (95%) more than its research work (79%).

Table 4 Outcome of Interviews of Officials of the Ministry of Science, Technology, and Environment

unit: %

Do you know ERTC?		
No 24		
Yes 76	Yes	No
1. Do you understand ERTC's roles?	82	18
2. Does your work relate to ERTC?	63	37
3. Do you know whether ERTC does research on the environment?	79	21
3.1 In case of "yes", have you ever used ERTC research work?	16	84
4. Do you know whether ERTC organizes environmental training/seminars?	95	5
4.1 Have you ever participated in ERTC training/seminars?	31	69
(1) Your satisfaction in participating		
High		63.6
Moderate		27.3
Indifferent		9.1
(2) Do you think ERTC's training/ seminar are beneficial?	100	0
(3) Would you participate again if you have a chance?	100	0

Source: Questionnaire data

Only 16% of them applied ERTC research work (Table 4). With regard to training/ seminars, 30% of the total number of the interviewees participated of which 91% were satisfied with the training/seminar programs. All those who participated in training/ seminar said that the programs were useful to society and the environment and all would participate again if they have an opportunity.

Former Participants of ERTC's Training/seminar[12]

The evaluation of ERTC's 100 former training/seminar participants by random sampling from 9 programs during the past 10 years by questionnaire interviewing reveals that 53% graduated with a bachelor's degree and 72% worked in the government sector. 47% of the samples participated in ERTC's training/seminars once and 94% of the samples had training/seminar expenses paid by their agency.

The correlation between various factors shows that the function of the agencies of the participants had relationship with the application of knowledge obtained from the training/seminar to their work. Training/ seminar participants from government agencies joined training programs which were highly related to their work at 58% of the total number of government officials who answered the questionnaire or 73% of the total number of interviewees. For the participants from state enterprises, the programs they joined very highly and moderately related to their work received an equal rating of 50%. With regard to the participants from the private sector and academic institutions, the programs they joined highly related to their work had the rating of 67% and 60%, respectively. Participants from NGOs rated the program relationship to their work at 67%.

With regard to the application of knowledge from training/seminar programs, it was found that 74% of the participants who answered the questionnaire from all organizations thought that the knowledge was very useful. The majority of them thought that the level the knowledge could be implemented is high both at the time of training/seminar (51%) and at present (58%).

With regard to the overall picture of ERTC's roles, participants rated high level (80%) for issue No. 1: Relationship between the training/seminar program and the participants' work; issue No. 2: Knowledge and benefits from training/seminar programs received; issue No. 3: Knowledge could be im-

Table 5 Opinion of Participants regarding Training/Seminar Programs

Unit: percent

Evaluation Issues	Nothing (0%)	Little (20%)	Moderate (50%)	High (80%)	Highest (100%)
Relationship between training / seminar program and work	0	4	18	57	21
Knowledge and benefits obtained	0	1	14	74	11
Knowledge obtained could be utilized	2	3	35	51	9
Knowledge obtained is still beneficial to work at present	4	6	17	58	15
Opinion on benefits of training / seminar programs on agencies and personnel concerning environmental work	0	1	6	59	34
Would you participate again if you have a chance?	1	2	7	32	58

Source: Questionnaire data

plemented at the time; issue No. 4: Knowledge is beneficial to current work: and issue No. 5: ERTC's training/seminar programs are useful to personnel concerned with management of natural resources and the environment. Only the issue regarding participants' interest in rejoining training/seminar programs received 100% or the highest level from the majority (58%) of the participants, as shown in Table 5.

5.3.4 Impacts

Social impact: Either environmental research work or training/seminars conducted by ERTC create a positive social impact on Thailand, they are: (1) training programs help raise awareness of the people in the management and conservation of natural resources and protection of the environment such as the Eco-tourism Management Training Program, and Strategies in Raising Community Environmental Awareness. (2) Dissemination of natural resource and environmental knowledge from research work and training programs to communities helps create cooperation and willingness in resolving the problems they are having. (3) Enhancement of individual participation in the management of natural resources and the environment of the locality supports the government's policy of decentralization of power in that people of the locality carry out their own policy in the protection and conservation of their natural resources and the environment.

Environmental impact: Many ERTC's research works are positively beneficial to environmental rehabilitation and Thailand's environmental development. In addition, research works were also implemented such as the prescription of groundwater standards in the year 2000 which was in continuation of research on the Development of High Sensitivity Gas Chromatograph for Detecting Factories Causing Groundwater Contamination by Volatile Organic Compounds and the designation of pollution control areas from a research entitled: Study on Arsenic Contamination in Dust and Rainwater at Ronphibun District Nakhon Si Thammarat Province.
Environmental personnel were much interested in ERTC's environmental training/seminar programs which is evidenced by the increasing number of applicants applying for participation each year. Some programs such as Eco-tourism Management, Community Waste Management, and Environmental Awareness Raising, interested a great number of prospective participants and had to be reopened for a second or third round in following years.

5.3.5 Sustainability

ERTC's sustainability can be analyzed in three areas as follows:

ERTC's roles towards society and the environment: ERTC has been established for more than 10 years and is well known for environmental training. ERTC is well staffed with resource persons, experts, and well equipped with tools and training venues. Besides, being an agency of government under the supervision of the Department of Environmental Quality Promotion, the Center has credibility and is accepted by personnel involved in the management of natural resources and the environment of the country.

Another major role of the Center is the research and development work on the follow-up and monitoring of environmental quality and the development of appropriate technology for the control of pollution. The Center's research works were acceptable and led to prescription of measures, formulation of policy, and implementation plan of environmental management of the country. It also plays important roles in local administration as it has been assigned by the Ministry of Natural Resources and Environment to prepare training programs for basic management and how to draw up environmental quality management plans to train environmental of-

ficials nationwide in 2003. This is to enhance sustainability of Thailand's management of natural resources and the environment in the future.

Operating Budget: One of the factors enhancing ERTC's sustainability is the Center's operating budget which is presently provided 100% by the government. At present, 17% of the Center's annual budget is allocated to project management. Each year, the research budget would be cut by more than 50% resulting in narrower scope of studies of several projects.

Besides, ERTC is now facing a major problem of having to leave the government agency system. The Center is engaging Thammasat University to carry out a feasibility study regarding the problem. In addition, cooperation and assistance from the private sector and overseas organizations are usually in the form of personnel development and tools/equipment rather than project expenditure. Such being the case, ERTC may face problems in its operation in the future because of the rising operating expense, if the organization is transformed into a private enterprise.

Future Organization Development: A factor obstructing ERTC's sustainable development is personnel constraint. Although ERTC is assisted by overseas organizations and other bodies in building up the potential of Center's researchers by their supplying of experts giving advice or conducting joint research work, the government sector policy for not increasing the number of government officials resulted in no development of operating personnel having employee status. Resignation of employees who had been trained for a long period of time and had reached operation level caused loss and non-sustainable development to the Center. Another undertaking which has continuity both in the operation and long-term benefits to society is the development of the Center's potential by the setting up of the Environmental Standardization Group. The Group coordinates the accuracy of information concerning pollution from laboratories among agencies. It also provides technical assistance to environmental laboratories including the setting up of environmental laboratory standards serving the government and private sectors. ERTC's highlight is its experts who provide an important service in setting up laboratory standards, the first of its kind in Thailand. A good opportunity would be to bring about sustainable development to the Center in the future.

5.4 Lessons and Future Direction

The review of ERTC's roles in the past revealed that the Government has become aware of the importance of the Center towards Thailand's environment and society which has been evidenced by consistent budget allocation for the Center's operation during the past ten years since its establishment in 1992. The Center's performance has been accepted and led to the country's formulation of environmental policies and plans as mentioned above. At present, the Government is considering a plan to adjust the Center's roles to make it an even more important agency in the country's environmental research and training activities.

Besides, ERTC itself has continually developed its potential and readiness and has reached the capacity of becoming an Asian leader in environmental research and training with an intent to become the regional center in these fields. In addition, the Center has a plan to develop itself to become a center for the setting up of laboratory standards and clean technology.

ERTC's problems since its inception until presents influencing its future direction are:

1) Personnel: As mentioned earlier, the government's policy not to increase the number of its personnel caused inade-

quacy in operating level officials as they are now moving on to senior and executive levels. The policy also affected personnel development as operating level officials are hired on a temporary basis. After having been trained and becoming competent, they would resign and move to a more secure job.

2) Privatization: Because the Center's development was rapid and it is better prepared than other agencies in the Ministry of Natural Resources and Environment together with the government's privatization policy, the Center is eyed as being capable of governing itself without having to rely on the government. If the Center is separated from the government system, it will have to charge research fees and training fees more realistically (at market prices) which will make competition tougher as there are many consulting companies at present. Its credibility would not be as high as before as it is now within the private sector.
3) Budget: Each year budget cuts in research projects cancelled the purchase of research technology and research tools/equipment. Only the purchase of high priority tools was sustained. Scope of research had to be narrowed in accordance with budget allocated thus impeding the Center's research projects.

However, highlights in ERTC's future development are as follows:

1) ERTC's personnel expertise: Most of the officials of the Center have been working since its inception and are bound to it. They are specialized academicians in this field who will be the major force for the Center's future development.
2) Well-prepared: The objectives for the establishment of ERTC was to find effective ways to promote pollution control activities, to support administration of research in national level environmental laboratories, and to organize research and training systems. These have made the Center well-prepared for premises, equipment, and personnel to accommodate such undertakings. ERTC therefore has unity and potential in conducting environmental research and providing services regarding environmental standard checking, setting up of laboratory standards and training effectively.
3) Connections: From its credibility and being well-known in research and training, the Center has joined international research networks and has been given assistance from many countries and international organizations. Good relationships would lead to the building up of an environmental network in the future.

From its advantages and drawbacks, the Center's future direction could be formulated by rectifying its drawbacks and highlighting its advantages, i.e., the Center should separate its administration from the government sector in order to fully effect personnel development. Staff members should be increased where necessary and decreased where it is not in order to create flexibility in administration and management as well as high levels of efficiency in the case of a private sector type of administration if the policy is formulated as such. The Center can use its advantage in personnel resources to lead its personnel development at a practical level. Its readiness in premises and equipment will enable the Center to continue its training development without having to start at square one.

In addition, market competition would be a significant factor propelling the Center's further and stronger development with real operating expenses and profitability. Projects could be launched without being affected by cuts as when relying on government budget.

Good relationships with other organi-

zations are not only useful in searching for grants for the Center's research and operation but also is useful in its development in building up international environmental research and training networks. Not only will it become the exchange of research technology, knowledge, tools/equipment among themselves, the cooperation will help set up environment standards or build up environmental market power against environmental measure trade barriers set up by other countries. If cooperation could be made towards this direction, ERTC would play important roles in Thai society and Thailand's environment in the future.

(Qwanruedee Chotichanathawewong, Sareeya Chairattananont)

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Chapter 6

Social Capacity Development for Environmental Management and Japan's Cooperation in Indonesia

Introduction

The Japan Society for International Development (JASID) Evaluation Team on Environmental Cooperation is undertaking a study to evaluate the Japan International Cooperation Agency (JICA)'s cooperation with the Environmental Management Center (EMC) to improve environmental management in Indonesia, and to utilize the results of the study for the improvement of the planning and management of JICA's related projects in the future. It is very important to understand the perception and the ideas of Indonesian expert's viewpoints on the social environmental management system in Indonesia and the role of EMC in the system. The main purpose of this study of the Development of Social Environmental Management System (SEMS) in Indonesia is to produce an analysis of environmental donor agency policy, especially from the JICA side, that concludes the current situation and condition. A further purpose of the study is to build a social environmental management approach and framework that can add value to research and policy about environmental management in Indonesia.

The objective of the study is to evaluate JICA's cooperation with the Environmental Management Center with an analysis of roles of the Center in/to social environmental management systems in Indonesia with a view to improving its planning and management and to enhance the effectiveness of JICA's related projects in the future.

Using a qualitative analysis methods within interviews, surveys, desk studies and report assessment, the study aims to assess SEMS context and strategies for Indonesia. The research finding is intended to provide insight into patterns, models and relationships that influence these SEMS concepts, including those that influence its implementation.

To achieve the objective of the study, CHCRE :

1. Collect and provide the necessary information and data (past and present situation of: JICA's projects in Indonesia, EMC activities, Environmental Management System in Indonesia and its application, Institutional framework of the BAPEDAL/State Ministry of the Environment, role of industry and public/private sector in the environment, public participation, community development, etc.)
2. Discuss issues with all stakeholders and resource persons from the Indonesian side (experts, professors from universities, high-ranking government officers, top executives, NGO leaders, non-formal leaders etc..) and from the Japanese side (JICA Indonesian office and the members of JASID), to get an idea of SEMS and the related roles of JICA and EMC.
3. Analyze the current social environmental management system (SEMS) situation in Indonesia and evaluate the roles and contributions of EMC in the development of SEMS in Indonesia.
4. Report on all data corresponding as a part of work output. The report outlines are background of the study, present situation of EMC and JICA's projects, facts and findings of JICA and EMC roles in SEMS, institutional framework of EMC to SEMS in Indonesia (past, present and recommendations), stakeholder role and participation toward sustainable SEMS in Indonesia, development of policy-program-and project

(3P) recommendations of SEMS etc.

5. Presentation the report for JICA and JASID.

6.1 Social Environmental Management System: Definition

We want to disengage this study from the debates about definitions of SEMS and its application on the Indonesia situation. As interesting as social environmental management was, it intended to focus attention on narrow social-based definitions and diverted attention from physical based orientation on environmental management systems. In fact, all approaches, physical or social, have an impact on each other. Nevertheless, the outcome of these debates, perhaps encouraged by a growing tendency among social scientists, economists and ecologists to see SEMS more holistically,seems to be a greater willingness by environmental executives to focus on wider and more dynamic dimensions of environmental management concepts.

This study does not attempt to ascertain how SEMS can be implemented in Indonesia, but focuses on the question of what is the Indonesian concept of SEMS, and within a framework of issues and questions of environmental problems suggested by the SEMS approach. As mentioned above, this study both contributes to and draws from JICA activity in Indonesia. The position put forward in that document concerning SEMS is consistent with the approach and findings in the study. The key points are:

Environmental Management System (EMS) is a practice of management and it consists of all aspects of environmental consideration such as physical, social, cultural, economical, and also political.

Sustainability is a key factor. Sustainable Development is basically in three dimensions: social,economic,and environmental.. Environmental sustainability is related subsequently to the environmental functions that sustain human life.

Social Environmental Management System is a system for social management approach within environmental management, and consists of actor (stakeholder), legal constitutional, institutional, policy (including program and project) and all key parameters to ensure environmental management objectives.

6.2 The Government's Environmental Management and Japan's Cooperation in SEMS

6.2.1 Environmental Management Principles Regarding Environmental Law and Regulation in Indonesia

Five Principles that might be considered in the development of social management systems in Indonesia, regarding Law No. 23 of 1997 regarding environmental management, are as follows:

1) The Indonesian environment must be preserved and developed so that it continues to be a resource and life support for the community and people along with other living creatures of Indonesia for the continuation and increase of the quality of that life itself. Development as a conscious effort in processing and exploiting natural resources for increasing community prosperity, both for achieving external prosperity as well as spiritual satisfaction. Therefore, the use of natural resources must be harmonious and balanced with environmental functions.
2) The environment in ecological terms recognizes neither national region nor administrative region borders. However, the environment which is involved with management must have clear regional demarcation for the management authority. The environment which is meant is the Indonesian environment. Legally, the Indonesia environment covers the space in which

the nation of the Republic of Indonesia holds sovereignty and the right to sovereignty along with its jurisdiction. In this respect the Indonesian environment is none other than the region, which occupies a cross position between two continents and two oceans with a tropical climate and weather and seasons which confers natural conditions and position with a highly valuable strategic role as the place the Indonesian community and people carry out community life, be a nation and be a state in all its aspects. In this way , the concept in carrying out Indonesian environmental management is the Archipelagic Concept.

3) The Indonesian environment as an ecosystem consists of various subsystems, which have social, cultural, economic and geographic aspects with differing features which cause a varying supportive and carrying capacity of the environment. Such a condition requires the building and developing of the environment based on the fact that the presence of supportive and carrying capacity of the environment increases the harmony and balance of subsystems, which also means an increase in the endurance of the substance of that very subsystem. In this way, the building and development of one subsystem will influence other subsystems, which finally will influence the endurance of ecosystems in their entirety. Therefore, environmental management demands the development of a system with integration as its primary feature. Needed, then, is a national environmental management policy which must be implemented in strict accordance with principles and consequences from the center to the regions.
4) Development continuously exploits natural resources for increasing community prosperity and quality of life. Meanwhile, the supply of natural resources is limited and uneven, both in quantity and quality, while requests for such resources accelerate as a result of the increase in development activities to satisfy the accelerating and increasingly diverse needs of the population. On the other hand, the environmental carrying capacity can decline. Accelerating development activities carry environmental pollution and damage risks with the result that the structure and function of the ecosystem which acts as a support to life can be damaged. This environmental pollution and damage will become a social burden, the cost of reparation of which will ultimately be borne by the community and government.
5) The maintenance of the sustainability of environmental functions constitutes a community interest, so that it demands responsibility, openness, and a role for members of the community, which can be channeled by people individually, environmental organizations, such as non-government organizations, traditional community groups, and others, for maintaining and increasing environmental supportive and carrying capacity which becomes a mainstay of sustainable development. Development which incorporates the environment, including natural resources, is a medium for attaining sustainable development which is a guarantee of prosperity and quality of life of present and future generations. Therefore, the Indonesian environment must be managed by a principle of preserving environmental functions which are harmonious and balanced for supporting environmentally sustainable development for the increase in prosperity and quality of life of present generations and future generations.

6.2.2 Restructuring Operational Modality for Technical Cooperation of JICA in Indonesia

Japan's basic development theme for assisting developing countries is "Act Together and Advance Together - for - Poverty Reduction and Sustainable Economic Growth in Developing Countries", which is focusing on 4 main principles : (1) ownership and partnership (2) poverty reduction through economic growth (3) a human centered approach and (4) promotion of south-south cooperation. As for future economic cooperation with Indonesia, the Government of Japan has determined its basic policy based on the latest bilateral consultation in September 2001, by focusing on the three following pillars (1) support for economic stabilization, (2) support for various reforms and (3) response to urgent needs.

In response to severe financial circumstances that Japan has been facing in recent years as well as the changing social economic conditions in Indonesia, JICA needs to attach prime importance on its basic operational modality concerning the implementation of effective, efficient and prompt technical cooperation based on a precise perception of the actual and urgent needs of the Indonesian nation.

- JICA has formulated a Country Program for Indonesia, which consists of the priority issues and sectors as reference for the arrangement of a cooperation program as well as an annual cooperation project formulation.
- JICA has been continuing to improve the mechanism of need survey to establish better coordination at entry stages for the formulation of new programs and projects through dialogue and consultative meetings with the National Development Planning Agency (BAPPENAS) and the Office of the State Secretariat (SEKNEG) as coordinator and main counterpart agencies for JICA in handling the overall technical cooperation in Indonesia.
- JICA has restructured its cooperation system to make it more flexible by using a new terminology called "Technical Cooperation Project" instead of "Project Type Technical Cooperation (PTTC)". In Indonesia, this restructuring has been conducted through the process in the need survey mechanism since April 2002 particularly for the formulation of new projects for next fiscal year 2003. Through this new restructure, it would be possible to formulate a project with a flexible component of intervention based on the need, flexibility to identify the size and the period of project implementation based on the setting of objectives for each project on the Project Design Matrix (PDM).
- JICA has considered formulating its priority program in challenging areas and sound soft oriented approach such as economic reforms, good governance, social development and poverty reduction through various forms of cooperation programs in Indonesia. Meanwhile, other infrastructure developments shall also be considered as one of the priority areas to contribute to increasing economic growth.
- JICA Indonesia is enhancing grassroots monitoring and an ex-post evaluation system to provide a feedback for maintaining the quality of development assistance by collaborating with research institutes and local consultants to objectively maintain the result and progress of the project or program. On the other hand, JICA emphasized a quick impact of intervention to the target beneficiaries at the grassroot level through the implementation of community empowerment programs (CEP)

in collaboration with Non Government Organizations while facilitating partnerships between Indonesian and Japanese non-profit organizations for the contribution to the welfare of the Indonesian people.

- JICA has emphasized transparency and accountability on every single project operation by using a bidding and tender system for a more efficient and effective budget, while strengthening the examination on cost estimation at entry stage and inspection of every item of the budget as a responsibility for the execution of the project or program.
- To promote the sustainability, JICA has given opportunities to the Indonesian side to propose their own priority programs and projects, which match with the JICA Country Priority Program for Indonesia. As a one tool for such promoting sustainability, JICA has also tried to conduct mutual discussions to allow more active participation of the Indonesian counterpart in the project formulation, implementation as well as sharing budgeting matters to maintain the sustainability of the project in the future.

6.3 Financing Social Environmental Management in Reformation Era

6.3.1 Institutional Development and Financing of the Environmental Management

In managing natural resources and the natural environment, it is pertinent to question what kind of institution and how much of the authority is given to it. Before answering the question it is necessary to understand the functions of the natural environment such as providing the natural resources to be processed further to produce goods to fulfill human needs., as the source of *natural amenity which is directly consumed by humans or animals, and also as a natural assimilator.*

Furthermore we need to understand the characteristics of the natural environment:

a. As *public goods*
b. It has *externalities*
c. *Common property and common access*
d. *Priceless.*

Our experience tells us that both the poor and the rich private sectors have been exploiting the natural environment. Therefore, based on the characteristics of the natural environment, it is appropriate to assign the government to be the responsible institution for managing the natural environment.

The private business sector is always profit oriented (*profit motive*), whereas the characteristics of the natural environment can not guarantee profits to the initiator, because it is public goods and has more externalities. This is called *the market failure*. Hence, the government has to take care of the environmental function. However, there are also *government failures*, since there are always pressure groups in the country and private interests that may cause the government to fail to manage the natural environment.

The managerial function for the natural environment according to the Law No. 23 Year 1997 on the Management of the Natural Environment is given mostly to the Ministry of Environment as an institution to determine policy for environmental management which is inter-sectoral in nature.

Formerly, the responsibility to control the development of activities that affect the environmental quality was under BAPEDAL. At the beginning, this institution was directly responsible to the President of the Republic of Indonesia and not under the Ministry of Environment, even though the Head of the BAPEDAL was also the Minister of Environment. But with the Presidential decree No.2 Year 2002, the State Ministry of Natural Environment was changed to be the Ministry of

Natural Environment. BAPEDAL is no longer to be a separate institution, but is merged to be under the minister of environment. Under the minister of environment, there are now seven deputies to the Minister of Environment.

Since the implementation and impact on the natural environment are found in local regions, it is important to form BAPEDALDA as a local government apparatus to manage the local natural environment. Formerly the formation of the BAPEDALDA was related to the existence of the Central BAPEDAL. With the disappearance of the Central BAPEDAL, the Regional BAPEDALs in Jakarta, Riau, Makasar and Denpasar are still maintained. Also the BAPEDALDA in each province and Kabupaten and Kota (Municipal) are still functioning.

The main task of BAPEDAL first of all is to develop staff and experts in the field of engineering, management, administration, library, and main laboratories. Therefore, the environmental management center (PUSARPEDAL), now called SARPEDAL, was established. The EMC's role is to support the development of laboratories in many regions. The regional laboratories were located separately in different offices such as in the Department of Public Works, Department of Industry and Trade, and Department of Health. Now, all those laboratories are planned to be under the Provincial BAPEDALDA.

The Japan International Cooperation Agency (JICA) has supported the establishment and development of the EMC (SARPEDAL), from the building construction and other physical development including the machines and technical instruments as well as the development of human resources through training and education.

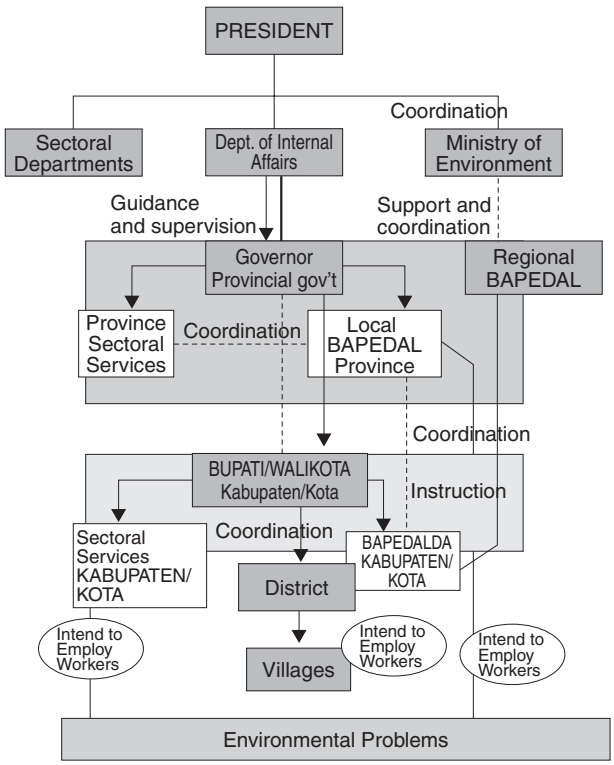
In managing the natural environment the role of the local government both at the provincial and tabulate levels are very important. The provincial BAPEDALDA and the *kabupaten/kota BAPEDALDA* are not under the direct instruction line with the minister of environment, but they are under the instruction line of the governor and the Pupate/Mayor, respectively. With the decentralization system the role of governor is more as coordinator and not instructor to *Bupati and Walikota*.

Horizontally, sectoral departments such the Department of Forestry, Department of Energy and Mineral Resources, Department of Agriculture, and Department of Ocean and Fishery, and Department of Industry and Trade are assigned besides to increase production as well as manage the balance between the natural resource availability and the preservation of the natural environmental functions. Thus, the main actor to manage the natural environment at the national level are those sectoral departments. The horizontal relationships formerly were through the regional offices, but now are directly to the local government's sectoral offices which are under the authority of the *Bupati or Walikota*.

The consultancy line is from the Minister of Internal Affairs to the Governor to Bupati and Walikota. Then, from Bupati and Walikota there is an instruction line to Camat as the head of districts and directly to the village heads. Again under the decentralization system there is no instruction line from governor to Bupati or Walikota. Under the Bupati and Walikota, there are Sectoral service offices (Dinas), Planning Board (BAPPEDA), BAPEDALDA, and Local Government Secretariat as the responsible institutions for the management of the natural environment. See Figure 1 and Figure 2 attached.

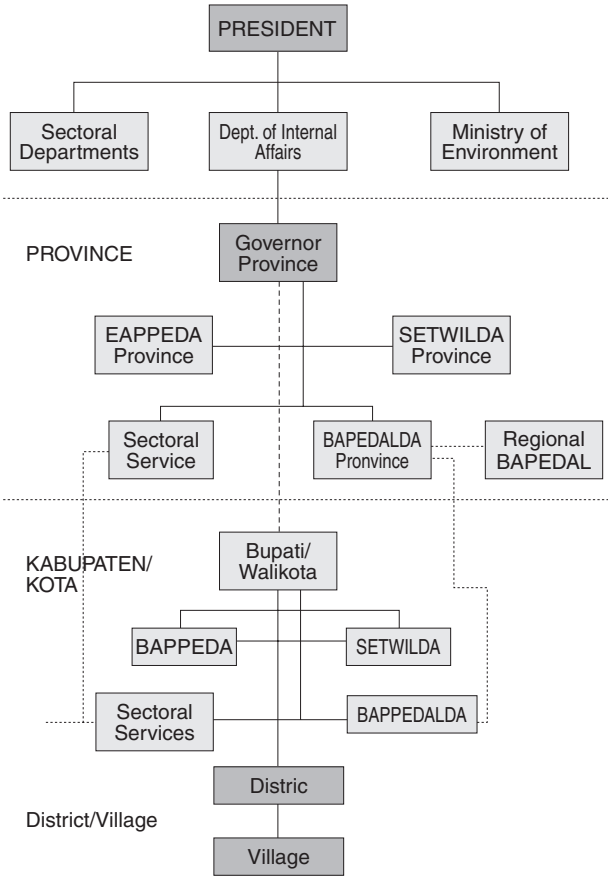
Note that the Environmental Management Center (EMC) was under the CENTRAL BAPEDAL, but since the year 2000 with the new Cabinet structure, the EMC position was restructured to be under Deputy VII on Environment Infrastructure. The BAPEDAL itself does not exist at the central level, but still exists both at the regional level and local level. This new structure we think will not be effective in the control and management of environmental quality. In the United States of America, the role for controlling and manag-

Figure 1 Government Structure and Environmental Management



Source: The author

Figure 2 Function Relationship between Institutions



Source: The author

ing the environmental quality is with the Environmental Protection Agency (EPA). an institution similar to the former BAPEDAL in Indonesia.

Why it is not effective is because the line of instruction becomes too long. Environmental management is in fact according to the Law No. 23 1997 under the President of the Republic of Indonesia. So in fact, BAPEDAL was directly responsible to the President, but now to the Minister of Environment.

6.3.2 Economic Crisis facing Environmental Condition

Starting in mid-1997 a severe financial crisis hit most Asian countries, including Indonesia. The crisis has significantly changed almost all aspects of life in the country. The economy that constantly grew in the last few decades, suddenly contracted by 13% in 1998, and within a short period of time, the shock has caused impacts on the welfare of the population. In the first place, it directly raised unemployment which resultedin the decrease of household income and, hence, reduced purchasing power.

Adding to the severe macro-economic situation, the long drought caused by El-Nino in 1997 also reduced employment opportunity in the agricultural sector. The situation was worsened by a high inflation rate (reached 77.6% in 1998) which decreased purchasing power even further. In the social sectors, a steep price hike has reduced the service quality of important sectors such as health and education. Secondly, in the household sector, the lower level of income forced people to change their consumption patterns, where women and children were usually the most vulnerable family members - particularly among the poor - as the households' con-

sumption pattern changes.

In the beginning of 1998, when the secondary impacts were more evident, some experts warned of the possibility of "lost generation: in the future if no interventions were taken to lessen the impact. Future physically and intellectually weak generations would result from today's children who are malnourished and whose parents could not afford education and health services for them. Furthermore, a drastic change in living standards had built up more conflict and social unrest. It usually started from a household level (domestic violence), which accumulated at a community level (higher crime rate), and even in the society (higher political tension). In Indonesia, this tertiary impact of the economic crisis had changed overall political constellation within only 9 months after the depreciation of its currency (Rupiah) to the US Dollar in August 1997.

Since the central government does not provide any subsidy to local governments, but lets the local governments share the revenues that come from exploitation of natural resources (Law No. 25, 1999 on the Sharing of Revenues between Central and Local Governments). This new law causes the local government to enjoy a high share of revenues from the exploitation of oil, gas, and other mining resources, and even forestry and fisheries, and gives incentives to even further exploit the natural resources found in their own regions. The non-rich natural resource local governments attempt to introduce new source of local taxes and fees to maintain their survival due to shortage of local finances. The environmental quality is threatened very badly.

In fact before 1998, Indonesia enjoyed a high rate of economic growth (7% per annum). But after the financial and economic crisis, the Indonesian economy was hit very severely. The growth rate of the economy dropped 14% in the 1998, but then recovered very slowly and reached about 2.0% in 2002. This means that the economy is still below the year 1997. The government of Indonesia has maintained high level of foreign debt. About 40 - 45% of the national budget was allocated to the payment of foreign debt, while more than 15% of the national budget come from the exploitation of natural resources. There is no other source of revenues to run the economy of the country other than exploiting the natural resources. Low income of the people means low government tax revenues and low private savings. As a consequence, the government has to increase the revenues from the working contracts of natural resource exploitation by increasing the rate of resource depletion or increase the foreign debt which both result in poorer conditions for the country. Increasing the flow of foreign direct investment seems impossible, because economic incentives do not work well due to the high risk for foreign capital to be invested in Indonesia. So Indonesia is in a big dilemma now.

6.3.3 Reformation Era: Democratization and Decentralization of Environmental Management

Decentralization as a strategy for economic and social development and for nation building has become accepted around the world. Most developing and transition nations have by now adopted a decentralization program in one form or another.[1] Decentralization could well be the right policy for Indonesia because it moves government decisions closer to the people, a crucial ingredient of governance in a country that is so large and so diverse. With local elections it will lead to better public services and better public servants, and more participation. In the long run, decentralization could make Indonesia a stronger, more stable, and more democratic nation. [2]

The two laws, Law No. 22/1999 on Regional Government and Law No. 25/1999 on 'Fiscal Balance Between the Central Government and the Regional Governments' consti-

tute a break-through from a centralistic government administration to a more balanced distribution of power and functions between central and local government, as well as development funds. The two new laws have officially been implemented starting January 1, 2001, and give wide-ranging autonomy to the district/municipal government full-authority in the planning-cycle process and control over their finances (revenue and spending), civil services, and organizational setup.

Related to the democratization process, the Law No. 22/1999 clearly divides the executive and legislative body at the local level. As a consequence, the head of a district/municipality is elected by the local parliament (although the winner still needs approval by the president) and is accountable to the legislative body only. However, in the Law there is no clear connection between the government and civil society in general.

Through the Law No. 25/1999, in addition to the regional government's own revenue, the regions will receive "the equalization funds" that consist of revenue sharing from taxes and natural resources exploitation, a general allocation grant (DAU), and specific grants (DAK). The regional governments may also receive funds from external loans or grants, although this entitlement has been suspended in both fiscal years 2001 and 2002 for the state's balance of payment reason. This cancellation by a letter from the Minister of Finance early in the year 2001 has to some extent triggered dissatisfaction from some local governments accusing the central government as being reluctant to help the regional and local governments in their economic recovery.

To implement the decentralization policy the government has divided the implementation stages into 4 (four), namely: initiation period (2001), installation (2002-2003), consolidation (2004-2006), and stabilization period (2007 - onwards). The initiation period covers the development of the new regulations, guidances, etc., including their dissemination. This stage also includes efforts to deal with risks in the context of initial implementation of regional autonomy and response to be given - by the central government - to deal with several problems that are arising in implementing the regional autonomy. The installation period includes the continuation of all not-yet-finished activities in the first period and the development of activities for strengthening, elaborating work, and adjusting to the existing and the newly developed system.

6.4 Prospects and Partnership to Develop SEMS

6.4.1 Prospect of Social Development: Democratization and Decentralization Perspective

Social development and meeting the basic needs of the people are clearly now the task of local governments as stipulated in the Law 22/1999. However, experience during fiscal years 2001 and 2002 showed that local governments are less responsible in this matter for the reason of lack of funds. In addition to that, it seems that sectoral ministries do not want to lose their grip on the sector they are dealing with after more than three decades.

It is necessary to open wide-range opportunity for public participation from the village level to vanguard the local autonomy not being a transfer of centralistic and authoritarian approach from central to local government. Both laws have has fostered the authority of local parliaments, wider scope of participation in decision-making process is however nor clearly defined in the new legislation, except an "urban forum" which consists all stakeholders of development at the local level.

An attempt to form a multi-stakeholders forum at district level all over Indonesia however had been exercised by the Government since 1999 through the Social Safety Nets program. Despite success achieved in some re-

gions, the exercise was hampered by lack of consciousness at the community level and civil society as a whole, and that the forum is mainly financed by local governments. Once the budget is not allocated to them, the forum is diminished.

The problem--related to the previous political practices--is how to encourage the civil society to be more involved in the development process. In general, non-governmental organizations (NGOs) or community based organizations (CBOs) have very important roles in enhancing participation at the local level. At the grassroots level, they can be a facilitator and mediator of the empowerment of local community; facilitating the community to be organized, increasing their capacity in decision-making process, and improving their access to information and resources. At the municipal/district level (or even at the provincial or central level), involvement of civil society in decision-making processes may give a wider perspective of development needs. On the other hand, wider participation requires (and implies) a more *transparent* and *accountable* public administration.

6.4.2 The Basic of Partnership to Build Social Environmental Management

Partnership is the important part of environmental management that related to Agenda 21 of Rio. Partnership relates to section III of this agenda (that is strengthening the role of the major groups) which related to Agenda 21 Rio. This foundation was built and promoted by government and various relevant stakeholders. The government should consider youth groups, native people/ aborigines, NGOs,technological communities, scientists and labor groups and industrial and business groups.

Referred to the idea of Good Governance, it can be interpreted as an optimal and effective function of governing elements. Those elements are: the government, people's representatives, judicial bodies, after that private sector includes industry, banking and business, and the actors of civil society such as NGOs, professional groups, and universities. Those three elements of nations (State, private sectors and society) should create checks and balances in which each component can assess and control mutually in order to reach and maintain stability among the elements.

To reach the state of Checks and Balances, it requires the existence of representative bodies, which are able to implement the control function and meet people's aspirations, self-standing independent judges, clean and professional bureaucrats, which have integrity strong and are responsive to the needs of the people. Another requirement is a strong civil society. These requirements allow the implementation of civil society to implement public control and decentralization, and also foster strong local representatives.

Decentralization within the good governance context is management of local things by the people and also the local people themselves. Decentralization is the main element of Good Governance starting from the assumption that the people themselves better conduct public sector management. Local Policy as consequence of decentralization assumed that it would be easier to absorb local aspirations compared to a policy implemented by the central government. Based on theoretical public policy, the products of decentralization can be interpreted as more participative or aspirational.

Partnership even at various levels of participation is a bridge for genuine participation. This partnership is bridging the point of conflict to the point of partnership and then to the point of participation. Starting from this partnership, the process is moving into participation in decision making as public legitimacy. Partnership can help the work of local autonomy in government and between locals.

The NGOs and stakeholders in social development3 expected few things inside the

partnership relationship:

a) No victim or lost among the stakeholders
b) Equality among the stakeholders
c) Concern for women
d) There is a consideration on the belief and the weakness
e) Right to participate or right to be involved (during the stage of planning, implementation and controlling)

6.4.3 The Roles and the Contributions of EMC in the Development of SEMS in Indonesia

In examining the roles and contributions of EMC in the development of social environmental management system (SEMS) of Indonesia, first of all we must examine other factors that might affect the SEMS. Since Indonesia consists of many different islands and tribes, we will examine the common type of the SEMS, especially related to the pilot project of the EMC in North Sumatra and the EMC itself in Serpong.

When we talk about the SEMS, we should have in our mind that what we meant by social environment is related to the social interactions between individuals to form organization as to maintain the social agreements and justice related to the natural environment. The social institution can be in the form of family or a group of individuals or companies as a society where interactions among the members including the rules and regulations for maintaining the good quality of natural environment take place..

The SEMS has been developed in such a way that formerly the local wisdom was adopted by the local society mainly to meet basic needs. However, with the development of needs as a function of modernization, societies were forced to change their wisdom and become unfriendly to the natural environment. Both the rates of depletion of the natural resources and the levels of pollution have been increasing. This phenomenon has been occurring since the 1970s when the oil bonanza came to Indonesia and foreign investments were accelerated to exploit Indonesian natural resources. The local SEMS were destroyed by the new systems of profit-oriented types of management. However, it seems that the awareness of the Indonesian people has come to start to see the negative impacts of economic development which may not guarantee the sustainable development for the country.

Starting with the growing awareness of the government and the whole society (the people and the business firms), it is imperative to reverse the environmental condition from the present exhausted natural resources (both renewable resources and non-renewable resources) and the poor quality of the environment into a new condition with better natural resource stocks and better quality of the environment. For the start we must have a good monitoring system as the result will be useful to prove as evident to the polluters and they must be responsible for the negative burdens on society.

An Environmental Management Center, to be created or already existing but with additional functions, will greatly enhance the development of SEMS in Indonesia by playing a role as agent to develop social capacity for environmental management. Environmental concepts developed elsewhere will tend to fail if used as a basis for environmental management in Indonesia or other countries in the Indo-Malaysian Archipelago (Malaysia, Brunei, Indonesia, South Philippines, Papua New Guinea) since the environmental setup of most parts of the Archipelago could be considered almost unique.

The most important factor determining the social capacity is the member of society and manpower having the knowledge and understanding of the environment, its principles and the implications in environmental management. Consequently, the Center must have education and training programs conducted routinely and staffed by environmentally com-

petent personnel.

To perform its role, the Center has to be additionally equipped with education and training facilities such as audio visual aids, appropriate field laboratories for environmental analyses, library facilities, workshops and seminars.

To further stimulate widespread ecology efforts in society, the Center will have to have the capacity to organize eco-science-tours for junior and senior citizens, integrating tourism and outdoor fun with environmental management to produce, not necessarily immediate, environment- and eco- conscious citizens.

The Indonesian Department of Education has already initiated the so-called Environment-conscious Elementary Schools Program appointing several Elementary Schools as models. Several years' evaluation shows that in some areas little effect has been obtained and some even tend to fail.

6.4.4 Social Environmental Management System Model and Its Application

SEMS as a concept built of conditions and findings that followed the result of this study. It seems the concept of development is still not appreciated by various stakeholders including the buraucrats as decision and policy makers on the environment. This thing started as an individual understanding, and various institutions and communities were divided on environmental problems interpreted as related only into the physical problems. Beginning from this existing constellation and problems, the concepts of SEMS developed lt with various considerations and explanations as explained in the picture below.

SEMS should be built of the structural and transformation process that related mutually. On the structure relates the stakeholder problems: (i) Government, (ii) Private Sector and Market, and (iii) Community. Existing stakeholdersshould be represent ed on all sides (interests) in carrying out their environmental program through the process and understanding, which are articulated in legal consideration, formed in policies (by a government accepted by the people), and adapted based on a society and culture also accepted by the stakeholders and institutionalized.

The context of SEMS applications needs a precondition that guarantees sustainability which is based on:

- Pillar of Sustainable Development that is interpreted as the existence of elements that covers the economy and environment that also ensures sustainability socially
- Equal information access, interpreted as access to information that ensures transparency during the implementation of the development activities that are sustainable.
- The executor of Good Governance requires transparency and fairness in the management of governance and environmental management
- A partnership approach during the implementation of policies and programs meaning equity and sharing in conducting the tasks.

Meanwhile in the SEMS context, the things that become constraints should be considered as: (i) Vulnerability context of society, (ii) Cultural norms make individuals/ people more sensitive to the process of change, that cause on the stagnation of social change itself, and (iii) Educational content appropriate to social and environmental problems.

Meanwhile, if the context of SEMS is already known with its prerequisites and conditions, then it can be applied to arrange or organize the strategy to arrive at the objectives of environmental management through social management. It should be remembered that this strategy should be framed within the context of democracy and decentralization in the era of transformation. This means

that in that era, the strategy in environmental management should avoid traps such as the exploitation of natural resources by local governments in order to fulfill local income targets. On the other side, when applied as the strategy, the democracy principle should be a foundation in policy application especially of the government.

If there is an alternative strategy that is applicable or matches within the environmental context in its country, then the target within the EMS or also SEMS should be reflected in the messages of environmental management such as:

- Awareness of stakeholders of environmental conditions and problems
- Participation of stakeholder s in environmental management
- Social benefits from environmental development
- Increased quality of life

6.4.5 Conclusion

So, what is the position of JICA as a donor agency? A donor agency functions as a bridge between the programs that are cross spatial and cross cultural focused on the empowerment of the community through:

- Enhancement of understanding on the rights and duties of humans in their environment
- Improvement of skills in handling environmental problems
- Enhancement of roles and involvement in the planning of environmental programs
- Improvement of quality of social economic quality through environmental development activities such as community development

What JICA did in 2002 and the plans for 2003 showed the picture of JICA's perception of the problems of environmental management at present. Based on that condition, the existing facility such as existing EMC can be increased on its role to improve the capacity of its human resources for the need of environmental development in the country (such as provinces, sub-provinces/kabupaten, and cities). JICA should put the budgeting and grants that had characteristics not only of physical things, but also opened access to the possibilities for educational improvement and environmental wisdom.

(Setyo S. MOERSIDIK)

Notes:

1. Alm, James and Roy Bahl, Fiscal Decentralization in Indonesia: Prospects, Problems, and the Way Forward, paper, USAID, Sept. 2000, p.l.
2. Alm (et al.), idem. P.2.

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Chapter 7
Conclusions

7.1 Social Environmental Management System as a New Framework

This report presented Social Capacity Development for Environmental Management (SCEM) and Social Environmental Management System (SEMS), new concepts for evaluating the process of capacity development in the environment in developing countries and for proposing appropriate international cooperation approaches for development stages. With new concepts for international cooperation, this report presented a new analysis framework and its application to selected Asian countries as well as reviewed historical development of cooperation approaches for developing countries especially, as they are experiencing rapid economic growth and industrial pollution.

Social Capacity for Environmental Management (SCEM) is defined as the capacity to manage environmental problems as a whole society by the main three actors; government, firms, and citizens. Seen from the viewpoint of new institutional analysis [North 1990], this concept can be turned into a systematic framework, Social Environmental Management System (SEMS). The three main actors themselves and their interrelations form the system. In addition, the relations between national and local levels are of great importance in the framework since actual problems occur at local levels and local firms and citizens have the most to do with the solutions while overall environmental policies and laws are established at the national level. SEMS, therefore, basically consists of the three actors, two levels and interactions of all parties.

The research owes a great deal to previous work by academicians and donor agencies for its fundamental background but this is an attempt to reorganize and integrate them in a new systematic analysis framework in two ways. First is a summary of the conventional two major streams for development and cooperation; capacity development and (environmentally) sustainable development. Second is a description of a framework with which we can grasp dynamic aspects of environmental management and international cooperation in a society and propose optimum involvement of the internal and external actors.

7.2 Methodological Side of SEMS

The stages and essential benchmarks of SEMS in developing countries were presented in chapter two. SEMS has three development stages.

System-making stage:

Fundamental functions of SEMS especially in the government sector are developed (environmental law system, environmental administration and environmental information).

System-working stage:

The system starts actually working to improve the environmental quality with some active interaction among the actors.

Self-management stage:

Comprehensive environmental policy is enacted and the system develops sustainably through strong interrelations among the actors.

A set of SEMS evaluation indicators, including four processes (monitoring, analysis and evaluation, policy-making, and policy implementation) and six factors (law and policy, human resources, organizations, financial resources, infrastructure, and information, knowledge and technology) for each actor,

were also proposed in the chapter.

7.3 Evaluating SEMS in China, Thailand and Indonesia

Chapter Three applied the SEMS analysis framework and important indicators to selected Asian countries: China, Thailand and Indonesia. China completed its system-making stage and entered the system-working stage around 1994 and now is moving toward the self-management stage. China's social environmental management will accelerate with the approach of the Beijing Olympic Games, which will be held in 2008.

Thailand was once ready for the system-working stage around in 1995 but some more time is needed to finalize system-working due to the financial crisis in 1997. It is in the mixed period of restructuring the system and moving to the system-working stage. Indonesia does not have an adequate environmental information system and, as in Thailand, the financial crisis and recent administration restructuring have caused the country some difficulties in managing the environment well.

Chapters Four to Six were written by local experts in the three countries based on the SCEM and SEMS concepts. In Chapter Four, Zhou Xin, Research Associate at the Policy Research Center for Environment and Economy of the State Environmental Protection Administration, assesses historical development of China's SEMS and observed five stages since 1949 to the present by presenting the original *time-situation-pressure-response* (TSPR) matrix. In the review of Japan's cooperation since 1992, the Sino-Japan Friendship Center for Environmental Protection is regarded as an accumulator of good experiences in bilateral and international cooperation pointing out the characteristics; demand-oriented cooperation, mutually promoted cooperation, comprehensive and all-sided function, adoption of a proper operation mechanism, and opening cooperation.

In Chapter Five, Qwanruedee Chotichanathawewong, Director of Energy, Industry and Environment Program at the Thailand Environment Institute reviews environmental policy instruments in Thailand with its focus on internal and external social pressure on market as an accelerator of voluntary approaches. The latter half of the chapter evaluated Japan's cooperation with the Environmental Research and Training Center based on the well-known five criteria of the Development Assistance Committee, Organization of Economic Cooperation and Development. The chapter concluded that good personnel and competence in the environmental consulting market are essential to get ready for the possible privatization (fully or partly) of the center.

Chapter Six was prepared by Setyo S. Moersidik, Professor and Director of the Center for Research of Human Resources and the Environment, University of Indonesia. This chapter discusses how government structural change and decentralization affect social environmental management in Indonesia and how the Japan-supported Environmental Management Center can contribute to further development of SEMS. Furthermore, SEMS framework was expanded to program planning and implementation by the Indonesian government and donor agencies.

7.4 Lessons from the Report

From the conceptual and methodological proposals and empirical case studies, this report derived the following conclusions.

First, with the three actors of government, firms and citizens and two levels; national and local levels, the concepts of Social Capacity for Environmental Management and Social Environmental Management System can well describe the dynamic situation of environmental management in a society.

Second, the essential benchmarks and representative indicators explain the development of SEMS. As mentioned earlier in this section, China is now shifting to the self-man-

agement stage of SEMS, and Thailand and Indonesia are trying to finalize the system-making stage though these two countries are in quite different situations. Starting with a rough evaluation of the stages, SEMS indicators should be further developed so that they can indicate changes in the system, especially the interactions among the actors. In addition, the stage model needs to be studied once again since environmental issues in developing countries are rather condensed and complicated and international factors such as trade and major international events, like UNCED in 1992, often affect economic and environmental policies in developing countries regardless of their capacity. Furthermore, some integrated index for SEMS analysis also should be put on the list of our next tasks.

Third, decentralization is one of the key issues in the development of SEMS and international cooperation. As in Thailand and Indonesia, many Asian countries are facing the problem in the function allocation and capacity development in environmental management in this decentralization era. More discussion should be followed for what kind of support with ODA and non-ODA resources is needed in this problem.

Fourth, the appropriate entry and exit points of environmental cooperation were also discussed. In case of industrial pollution reduction programs, including Environmental Center projects, it is most effective to implement the cooperation from the final phase of the system-making stage to the fully developed phase of the system-working stage as observed in the case of China in Chapter Three. This is because the center is expected to contribute to environmental policy-making and implementation with the project components of monitoring, research and training and needs a social system which the fundamental functions are developed enough to utilize itself, and after reaching the peak of industrial pollution, the country has principal capacity to manage it by herself.

7.5 Further Issues for Future International Environmental Cooperation

From a wider point of view, this report presents the following issues for further discussion on international environmental cooperation in the context of social capacity development in environmental management.

1) A comprehensive cooperation approach to deal with brown and green issues

The most conventional environmental cooperation had been done for brown issues (pollution-related environmental issues) and green issues (desertification, deforestation, biodiversity, etc.) separately. But actually some of the issues are strongly related (as in the case of air pollution, particulate matters specifically, in an urban area and deforestation in the surrounding area). And, from the viewpoint of Social Environmental Management System, a cooperation approach can be flexible and comprehensive if we take ODA and non-ODA together into account.

2) Ownership and partnership

Cooperation should not be one way but interactive. Donor countries need to encourage recipient countries to take ownership in their cooperation. This is necessary in order to build partnership, or horizontal relations, between developed and developing countries not only in the government sector but also private business and citizen sectors. Building partnership in good coordination among donor agencies and also among developing countries is another important partnership issue for effective and efficient international cooperation.

3) Globalization and environmental cooperation

Economic and environmental global-

ization should be taken into consideration in making a fundamental framework of international relations and environmental cooperation. Now globalization has direct effects on domestic issues such as trade and economy, poverty, and environment, which also affect each other. Besides the World Trade Organization discusses the effect of trade on environment, it is also an effective way to include environmental factors like establishment of an environmental committee, environmental cooperation, original environmental standards in bilateral or multilateral free trade agreements. The North American Free Trade Agreement is one example and it gave a positive pressure to Mexico to adopt higher standards of environmental management to join the Agreement. Japan has concluded a free trade agreement with Singapore and is now under negotiation with Mexico and ASEAN. Involving environmental issues including cooperation principles into economic agreements help both Japan and partner countries integrate the issues of trade and economy, environment and other relevant issues.

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