

Corporate Environmental Management: Imperatives for India

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India's economy has grown rapidly in the last few years consequent to the paradigmatic shift in economic policies that took place in early nineties. This attempt at liberalization of the economy has started paying off and GDP growth rates have reached 8-9 per cent per year. More importantly this growth has also been sustained during the last 4 years and India is envisaged to grow into the third largest economy in the world by 2050. Apart from the rapid economic growth, India's rapidly increasing population, estimated 1.25 billion in 2007, is also home to one of the largest middle class populations in the world. While the growth has been uneven across urban and rural areas, the overall purchasing power of India's middle class population is dramatically changing the consumption patterns across the country. This trend of shifting consumption from basic goods such as food and clothing to more branded products, travel, education, health etc. is predicted to have an adverse impact on the environment unless it is managed carefully. There is also the possibility that India may be headed for an economic slowdown unless the environmental issues are addressed prospectively.

The following sections of the paper are organized in to the following major areas; (i) Economic and environmental profile of India in brief, (ii) Industry and environmental policies and initiatives, and (iii) Case studies on selected voluntary initiatives.

India: Brief Country Profile

While the Republic of India is only about 60 years old, the country however has a very long history and rich heritage. India was under external rulers for about 8 centuries, including about 600 years under Islamic rulers from Middle East and Afghanistan and for another 200 years under the British. India became independent in 1947 after the end of Second World War.

In the initial decades after independence India remained an insulated economy with very strong controls on foreign direct investments as well as a strong emphasis on public sector. The annual growth in the first four decades were around 3–3.5 percent, and was considered by some many economists and policy makers as appropriate in the Indian context. This scenario changed in 1991 when the country went through an economic crisis prompting the Indian government to tentatively embark on several policy reforms to and looking at integrating with global economy. In the last few years the impact of the new policies have become visible with the increasing growth rates as well as the success of Indian entrepreneurs abroad, most notable being the success of the Indian software and pharmaceutical industry. The outlook for Indian

economy is very positive, with India's GDP grew at 8.5–9 percent consistently over the last 3 years. Some have also predicted that India would be the third largest economy in the world after China and the US by 2050 (Data monitor 2005; Jonathan et. al. of McKinsey 2006).

While as mentioned earlier this growth is uneven, it has however resulted in an increase in the disposable income levels of middle class both in urban and rural markets. A large population graduating from lower income levels to the higher income levels is expected to push the consumption, demand and subsequently supply for a new high in the country. These developments have tremendous impact on the demand and consumption patterns. They are likely to go through a major shift from subsistence basic necessities to luxury and convenience goods. A study by McKinsey and Company study notes that the demand for transportation, health care, education, processed food are increasing and envisage that it likely to increase several fold (Jonathan et al. of McKinsey 2006). From the market side, the market for food and beverages, transportation, textile, housing, and health care are likely to be the major opportunities. These growth opportunities are exploited by both domestic and foreign investments. In this context it is relevant also to note the role of Japanese investments in this transformation. Japan stands third among foreign investments in India, with only USA and Europe being ahead. While there are several successful examples of Japanese investments in India, one that merits the a special mention is Suzuki Motor's involvement in revolutionizing Indian automobile sector in particular and manufacturing sector in general. In the early seventies, the Indian Government partnered with Suzuki to setup a joint venture, Maruti Udyog Limited to manufacture small passenger cars in the country in the early seventies. This initiative as significantly transformed the manufacturing sector in the country. Maruti Udyog initiated and nurtured indigenous suppliers in the SMEs which subsequently developed into a major industry on its own right as "global auto ancillary and components" industry. This joint venture also has brought in number of manufacturing technologies to the country such as 'zero inventory, Just-in-time, good manufacturing practices, Total Quality Management, among others.

Currently, with over 350 Japanese companies operating in the country, these investments are spread all over the country. Indian consumers either directly or indirectly encounter Japanese products or technology in their day to day life. Examples include the Delhi Metro, Maruti Suzuki cars, Hero Honda motor cycles, Sony audio and video systems, National household appliances and several others. This relationship is an on-going process and India's Ministry of Industries and Commerce has designated special industrial parks for Japanese investments.

Environmental Profile of India

The fast growing economy as well as the demographic transitions in terms of the socio-economic profile have either created or have the potential to create several negative externalities especially environmental damages. This problem has been exacerbated with the rapid pace of urbanization in the country. Pollution levels in many urban cities in India are much above specified legal standards. Given this

India may be fast approaching the threshold levels of quality drinking water, clean air etc or going to reach very soon especially in the metros.

The regulatory agency in India, Central Pollution control Board (CPCB) has introduced ambient air quality monitoring under the 'National Air Quality Monitoring Programme (NAMP). The network consists of more than 300 operating stations covering 121 cities and towns all over the country. NAMP monitors four air pollutants namely, Sulphur Dioxide (SO₂), Oxides of Nitrogen as NO₂, Suspended Particulate Matter (SPM) and Respiratory Suspended Particulate Matter (RSPM/ PM₁₀) in all locations. Central Pollution Control Board coordinates the network by bringing in State Pollution Control Boards, Pollution Control Committees, and National Environmental Engineering Research Institute (NEERI). Given that large number of organizations, large number of personnel and equipments involved the data generated is more as indicative as absolute values (Central Pollution Control Board).

Water pollution is another major concern in India. Central Pollution Control Board and State Pollution Control Boards established more than thousand monitoring locations all over the country. Water quality monitoring network consists of 200 rivers, 60 lakes, and other water bodies. The water monitoring systems operates as three tier programme. Water samples are collected from all the monitoring stations and analyzed for 28 parameters, and limited number of organic pollutants. While given the regional and seasonal differences it may be difficult to make a judgment of status water pollution for the country as a whole, the results of this monitoring exercise from 1995 to 2005 indicate that organic and bacterial content of water bodies in India are above the accepted levels in many places. This is due to both industrial discharge and untreated discharge of domestic waste water in to the water bodies. While most large scale industries have established effluent treatment plants, many small scale industries as well as municipal and public bodies do not have adequate facilities for treating waste water. Further, due to inadequate and controlled flow of water in the rivers and streams also does not have sufficient carrying capacity. As a result the oxygen demand and bacterial pollution is on the rise, and lead to more water borne disease in the country (Central Pollution Control Board).

Environmental Management Institutional Structure

The Ministry of Environment and Forests of the Union Government is the national policy making body which acts as the nodal agency for policy making, planning, promotion, co-ordination and overseeing the implementation of environmental and forestry programmes. The ministry also acts as the nodal agency for United Nations Environment Programme in the country. The organizational structure of the Ministry involves a number of its Divisions, Directorates, Central Pollution Control Board, Subordinate Offices, Autonomous Institutions, and Public Sector Undertakings. India has evolved a multi pronged strategy over forty years. They include a legal frame work, involvement of non-governmental agencies in evaluation and testing, involvement of corporation and industrial associations and confederations. In 1976, the 42nd amendment to the Indian constitution incorporated Environmental protection and improvement into the constitution of India, probably the first instance of its kind in the world. Several Acts have been enacted

from 1977. The major legal provisions enacted for environmental protection and pollution abatement are as follows;

- The Water (Prevention and Control of Pollution) Act, 1974, amended 1988
- The Water (Prevention and Control of Pollution) Cess Act, 1977, amended 1992
- The Water (Prevention and Control of Pollution) Cess (Amendment) Act, 2003
- The Air (Prevention and Control of Pollution) Act 1981, amended 1987
- The Environment (Protection) Act, 1986, amended 1991.
- The Batteries (Management and Handling) Rules, 2001
- The Recycled Plastics Manufacture and Usage Rules, 1999.
- The Rules for the Manufacture, Use, Import, Export and Storage of Hazardous micro-organisms Genetically engineered organisms or cells, 1989
- Noise Pollution (Regulation and Control) Rules, 2000
- The Ozone Depleting Substances (Regulation and Control) Rules, 2000
- The Public Liability Insurance Act, 1991, amended 1992
- The Environmental Audit Notification, 1992
- The Environmental clearance Notification, 1994
- The National Environment Appellate Authority Act, 1997
- The National Environment Tribunal Act, 1995

The Central Pollution Control Board (CPCB) is the statutory body constituted under the Water (Prevention and Control of Pollution) Act, 1974. CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981. CPCB acts as the field force for the Ministry of Environment and Forests under the provisions of the Environment (Protection) Act, 1986. Principal functions of the CPCB are (i) to promote cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution, and (ii) to improve the quality of air and to prevent, control or abate air pollution in the country. The State governments have set up state level ministries as the state policy making body and State Pollution control Boards as the field support organization for implementing the policies and legislations. Over a period, number of activities has increased at the board level and a general ban on manpower addition has severely affected the implementation. It is well known that legalistic enforcement and policing is an uneconomical and ineffective mechanism in environmental management, and it is quite true in the Indian context also.

Judicial Activism: The second trend, the rise of judicial activism which led to the strengthening of existing provisions of the law and the constitution including those related to environmental protection. For example, courts have increasingly extended the boundaries of article 21, which states that no person shall be deprived of his life or personal liberty except according to procedure established by law, to incorporate the concept of environmental protection. Both the Supreme Court and many high courts have interpreted this to imply that persons who suffer as a result of pollution

can justifiably content that the fundamental right to live under Article 21 of the constitution is violated. In one such case the High Court of the state of Andhra Pradesh ruled that

"... There can be no reason why the violent extinguishment of life alone should be regarded as violative of Article 21 of the constitution. The slow poisoning by the polluted atmosphere of caused by environmental pollution and spoilation should also be regarded as amounting to violation of Article 21 of the constitution¹"

The eighties also saw the emergence of Public Interest Litigations in which the traditional rules regarding locus standi (that is the petitioner was required to prove that he was personally affected) were relaxed. Citizens were allowed to seek the intervention of courts in matters related to pollution and environmental degradation, even if they were not directly affected. Public interest litigation combined with judicial activism improved the access of the affected citizens to the courts for judicial remedy to their problems and increased the pressure on companies to respond to their grievances immediately

Due to failure of implementation, increasing pressure on general public and increasing awareness has led the citizens to approach courts for environmental dispute settlements. Indian courts have looked at these cases more sympathetically and have time to time passed directions and judgments to reduce environmental damages. However, they are not planned and systematically approached because only those cases that reached the courts are addressed and do not provide opportunity to consider the issue systematically and comprehensively. Some of the environmental initiatives which originated from court directives are; Adoption of CNG for public transportation vehicles in New Delhi, Protection of industrial pollution from Taj Mahal and surrounding eco system called Taj Trapezium, closure of glass bangle industries in Muradabad, and textile dyeing units in Tirupur.

Non-Governmental Agencies: Being a democratic country India allows freedom of press and environmental activism. Non Governmental Organizations participate in implementation of policies and in carrying out some of the activities of Pollution control boards as a third party assessor in effluent testing etc. On the other hand NGOs also act as whistle blowers and watch dogs in initiating actions against organizations and individuals causing environmental damages and also participate in policy making and opinion generation among the public. There have been several instances of corporate violations of environmental standards which have been investigated and publicized by non-governmental organizations. Increasingly some of the more activist organizations are also attempting to influence both public policy and the adoption of appropriate safety standards for industrial processes and products.

National Environment Policy 2006 (NES 2006): The Ministry of Environment and Forests has formulated National Environmental Policy 2006. The NES 2006 expresses the national commitment to a clean environment, mandated in the Constitution in Articles 48 A and 51 A (g), and it strengthens judicial interpretation of Article 21. The National Environment Policy 2006 (NES 2006), builds on the earlier policies and extends the coverage, and fill in gaps that still exist, in the context of present knowledge, contemporary issues and future in focus. The NES 2006 is integrating, The National Forest Policy 1988, The National Conservation Strategy and Policy Statement on Environment and development 1992, Statement on Abatement of Pollution 1992, national Agriculture Policy 2000, National Population Policy 2000, and National Water Policy 2002. NES 2006 is built on three foundational aspirations, decent quality of life for human beings, respect to finiteness of biosphere, and a superior goal of greater justice in the world. The planning commission of Government of India has expressed the need for balance and harmony among economic, social, and environmental needs of the country. NES 2006 is a positive commitment to such integration, and its focus is stated as;

- *Conservation of Critical Environmental Resources:* To protect and conserve critical ecological systems and resources, and invaluable natural and man-made heritage, which are essential for life support, livelihoods, economic growth, and a broad conception of human well-being.
- *Intra-generational Equity, Livelihood Security for the Poor:* To ensure equitable access to environmental resources and quality for all sections of society, and in particular, to ensure that poor communities, which are most dependent on environmental resources for their livelihoods, are assured secure access to these resources.
- *Inter-generational Equity:* To ensure judicious use of environmental resources to meet the needs and aspirations of the present and future generations.
- *Integration of Environmental Concerns in Economic and Social Development:* To integrate environmental concerns into policies, plans, programmes, and projects for economic and social development.

Corporate Voluntary Initiatives

Corporate voluntary initiatives are considered as an important Corporate Environmental Management practice. Industries perhaps have better knowledge about the environmental damages that it is causing than anybody else, and if they come out and commit voluntarily to reduce the pollutant content and negative impact, it can be a much more effective and efficient mechanism than trusted and policed by external agencies such as government and non-governmental ones discuss two good examples of voluntary actions by Indian companies.

Case I: Tata Group of Companies: Tata Sons is the holding company of the key companies of the Tata Group and holds the bulk of shareholding in these companies. Tata was established as a trading enterprise by Group founder Jamsetji Tata in 1868. The Tata Group is one of the largest and most respected business conglomerates in India, with \$21.9 billion as revenues in 2005-06, the equivalent of about 2.8 per cent of

the country's GDP. All Tata group companies together employ some 246,000 people. The Group's has 28 publicly listed enterprises — among them are well known and respected names such as Tata Steel, Tata Consultancy Services, Tata Motors and Tata Tea. The Tata Group has operations in more than 85 countries across six continents, and its companies export products and services to 80 countries.

Tata group companies are built on its core values; namely, integrity, understanding, excellence, unity and responsibility. From its inception these values were the group's beliefs and convictions, which even now continue to guide and drive the business decisions. Adherence to business ethics and their commitment to corporate social responsibility are part of Tata's corporate identity. The mission and vision statements of all the group companies highlight a clear approach to environmental sustainability of all its business operations and its importance in decision making. Even the manager has been identified and he is responsible for audit of different aspects of the sustainability management system. They are:

- Internal Financial Audits by Chief Corporate Audit.
- Internal TBEM Audit by trained TBEM Auditors under the guidance of Chief, Business Excellence.
- Internal Audit for ISO-14001 EMS by Audit In-charge EMS & Chief, Environment & OH.
- Internal Audit for OHSAS-18001 by Audit In-charge EHS & Chief, Environment & OH.
- Internal Audit for SA 8000 by Audit In-Charge & Chief, Business Excellence.
- External Financial Audits by M/s. A F Ferguson and Billimoria and Company.
- External EMS Audit ISO-14001 by M/s. IRQS.
- External OHSAS-18001 Audit by M/s. IRQS.
- External TBEM Audit by TQMS, Tata Services.
- External Social Audit by a group of experts comprising a retired Judge of the High Court or Supreme Court, a social worker of repute & technocrat or representative of large business house.
- External SA-8000 audit by DNV.

For instance in its steel business, all the units of Tata Steel are ISO-9000, ISO-14001 certified and the main steel works at Jamshedpur and Sukinda Mines are certified to SA-8000. Systematic analysis of the inputs and outputs as a Life Cycle Assessment is carried out from mining to hot rolled coils. The analysis was used to identify activities, inputs, or outputs that can have adverse impact on environment and society. Targeted improvement programmes were developed and incorporated in the annual business planning of products, services and activities through better operating practices and technological intervention. Tata Steel recycles the wooden and structural supports used during shipment in the downstream operations.

Tata steel has improved its compliance by making commitment by way of corporate disclosures. Tata steel brings out Corporate Sustainability Reports to provide information to the wider stakeholders. The environmental risks due to operations and products as investigated through R&D strategies are developed either to eliminate or at least minimize the adverse impact in the early stages of the project itself. One research survey conducted on corporate environmental disclosure in 2004 – 05 indicates the company's

commitment for information disclosure as a mechanism to strive to become more sustainable. Out of 25 companies which responded to the survey, 12 were Tata group companies.

Case II: Vorion Distilleries: Effluent Treatment and Gold Fish Culture: Vorion is chemicals and Distilleries company involved in distilling alcohol and other derivatives from molasses a byproduct of sugar mills. Spent ash is a worst industrial effluent in the molasses based alcohol distilleries. Untreated effluent can be a determinant for human health and affect human habitation in the vicinity of the distillery. Irritating and pungent odor are major characteristic of this unit. Vorion has initiated an effluent treatment cum fish culture project ten years ago well before the effluent treatment has become an issue. Vorion developed the technology indigenously with almost five years effort and put it to use in its distillery at Vedanarayanapuram, Chengai-Anna District, Tamil Nadu. The project has resulted in reducing the BOD to almost zero when the entire quantity of the effluent is passed through digester and bioconversion ponds and finally spread in about six hectares of fish ponds.

About 33,000 liters of alcohol was produced from molasses resulting in about five hundred thousand liters of effluent water daily. The effluent was dark brown with a characteristic offensive odor and with a BOD of 45,000 and COD of 92,000. People used to feel uncomfortable due to such offensive odor even at a distance of one kilo meter. The entire effluent treatment is a lengthy process involving bio-mechanization, anaerobic digestion, aerobic bioconversion for 12 -15 days. The BOD reduced to 1000. Anaerobic bacteria were used on the effluent at about 35° C to utilize the organic substances for 5 to 8 days. Anaerobic process converts organic matter into biogas and reducing the BOD level to about 3000 to 4000. The biogas contains about 60 % methane, 1-2 % hydrogen sulphide and 35 % carbon dioxide. The biogas generated is used as fuel in the distillery. When the gasifier operates at 90% efficiency about 10,000 m³/day biogas is obtained as fuel substitute for boiler. At that stage the digested effluent contains about 3000 to 4000 BOD, dead and live bacterial biomass, dark color and offensive odor. The effluent is collected in open bioconversion ponds made of brick wall and aerated continuously. Bacteria and algae are added to bring down the BOD to less than 1000 in 4-5 days.

Water that is left behind with digested biomass acts as a rich medium for Golden fish culture (*Tilapia* varieties). Vorion used a hybrid fish which can grow in dense population of about 50,000 fingerlings per acre. The fish had a characteristic golden color which was attractive to the customers and reached 400 gm in six months. High yield of 50 tones per acre gave an attractive return to the distillery apart from treating the effluent water. It is a good example of voluntary action by the company. In this case company had looked at the environmental issue as an opportunity and converted it into an additional revenue generating activity.

Need for better Knowledge: Research Focus

There is a need to develop in-depth and pragmatic knowledge about the management and policy that can help in economic growth and simultaneously improve environmental quality in Asia in general and

India in particular. With the current growth levels and emerging consensus on global warming at international level it becomes imperative for India to develop in-depth knowledge to dovetail economic growth with simultaneous improvement of environment. As a first step the policy initiatives for industrial growth and policy initiatives for industrial pollution abatement needs to be documented systematically and evaluate the impact. Given the resources and importance being relevant for implementation the knowledge generated has to be pragmatic and highly appealing to the industry for its use. Hence, the research needs to be more focused on the areas of maximum likely impact and sectors that have wider environmental problems and any initiative that can have benefit the community and economy at large.

Regulatory and policing approach has failed in number of countries. It was proved to be very expensive proposition for implementation and ineffective in achieving the objectives of pollution reduction. Apart from higher implementation cost the staff is overburdened because of restriction on recruitment and increase in additional responsibilities. Increasingly consensus based voluntary corporate environmental management approach is recommended for synergizing industrial growth with positive or at least non-negative environmental impact (Business and Social Responsibility Fund (2001); Corporate Social Responsibility Survey (2002)). However, there is no systematic body of knowledge about policies, practices that can be used in the Indian or Asian context (Rao 2005a, Rao 2005b). There is a need for systematic research to develop such knowledge. The major objectives for the research can be: (1) to enhance the knowledge and understanding of corporate environmental management opportunities and problems in India, The study can include wide ranging systems, processes, practices, values of corporations such as corporate vision, mission, operational principles, manufacturing practices, compliance, product and technology development etc.

The pioneering and spearheading corporations are interested in informing the stakeholders such as investors, employees, customers, communities, and government about their environmental performance. The strategic intent has positive impact on moving towards achievement of environment inclusive growth. Such initiatives can be studied by systematic collection and analysis of environmental initiatives, targets, operating plans, conduct of environmental audits, and disclosure of environmental information beyond mere compliance (Kathuria; Lopez 2004; Thomas 2001;). Small and medium enterprises do not have such resources and knowledge to improve the environmental performance. Supplier Technical Assistance programmes of large corporations help SMEs in developing environmental acceptable systems, processes, products, etc (Rao 2005a; Rao 2005b; Srivastava 2007; UNIDO 2002; World Bank 2003). Companies are motivated to pursue such programmes for enhancing their regulatory stance, cost reduction, competitive advantage, and innovation.

The research will focus on the above three themes for the specific industry sectors. Analysis of the economy indicate that automobile industry sector (SAIM, Ministry of Heavy Industries and Public Enterprises), food processing industry sector (Ministry of food Processing), and textile industry sector (Ministry of textiles) are likely to grow many fold due to increased domestic demand and export

requirements. Given that these industries comprise both large corporations and finished product level and large number of SMEs as the suppliers, and has considerable environmental consequences in production and the entire product life cycle they are important target industrial sectors for study.

The basic questions that need to be answered are;

1. Is there evidence to support a positive link between selected CEM approaches; disclosure of environmental information and supplier technical assistance and company level environmental and business performance?
2. If such a link (positive, negative or neutral) exists, is it more pronounced in some countries/sectors than others and what are the driving forces of promising models?
3. Is it possible to say market based instruments policies rather than regulatory policies best influence any positive links that may exist? Are there a set of policy mix that are required to get the most out of the approaches?
4. Can it be concluded that the characteristics of corporate environmental management differ primarily by sector or by country and certain types of international cooperation measures will have an impact?

The data collection process will consist of collating both qualitative and quantitative data. Selected case studies of successful and not so successful CEM initiatives, disclosure programmes and supplier technical assistance programmes from the targeted industry sectors will be carried out. And this will be followed by a survey to confirm the propositions and hypotheses that emanate from the exploratory phase.

Summary and Conclusion:

Integrating economic growth, social issues and environmental concerns has become an imperative now for India. The Government of India had passed legislations and directives from time to time to control polluting industries. As a public administration the dilemma of growth and long term environmental protection is conspicuous in the recent years. Policies are implemented by Central and State Pollution Control Boards. Shortage of competence, control mindset rather than facilitation, and increase in work load has affected effective monitoring of environmental initiatives within the industry. On the other hand Judiciary has forced several industries either to strictly comply with the emission norms or close down permanently. Increasingly NGOs are also becoming active especially to restrict multinational companies from environmental exploitation. Hence, the policy, support infrastructure, and regulatory institutions need to be integrated. Further, corporations need to demonstrate Corporate Social Responsibility (CSR) by voluntarily taking up the responsibility to reduce intra-generational and intergenerational equity.

While the Indian industry has responded to these pressures, there are still significant challenges ahead. Large corporations do voluntarily implement environmental policies and try to meet international standards. However, due to lack of facilities, technological innovations, dominance of small scale industries, poor awareness and concern many corporations continue to evade from environmental compliance. There is a need for understanding decision making processes of corporations in India to systematically integrate

environmental issues in the strategy development and implementation. One of the primary objectives of this research is to develop comprehensive approach to Corporate Environment Management (CEM) practices by consultative process.

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Corporate Environmental Management in China: A Cost-Driven Strategy

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1. Introduction

Traditionally, the governments in China promote good corporate environmental behaviors but with very inefficient implementation. More importantly, with the sole objective of economic development, industrial enterprises are given privileges in many aspects, including weak environmental compliance. In a less developed civil society, public pressures on both the government and enterprises have minor impacts also. Overall, costs of compliance and good environmental behaviors have been seldom key factors in corporate decision-making system. In recent years, China's rapid economic development is in a danger of facing severe environmental degradation, lower energy efficiency, pressure of climate change, and increasing civil demands on better environmental quality. Better Corporate Environmental Management (CEM) has been taken as one of the strategies to achieve a clean environment and sustainable society. CEM has been more strictly emphasized by the government and endowed with new requirements for enterprises in China. However, why there is such a dramatic change in CEM? How will this change affect enterprises' decision-making process? What could be the long-term socio-economic and environmental impacts of such a transition at a regional and international scope? There are very few studies in these areas so far. Based on our past observations and studies, we will demonstrate a theoretical framework for environmental governance and provide a cost-driven oriented explanation, aiming at answering these questions in regard to CEM in China.

In the following parts, section 2 and 3 will describe the environmental challenges and CEM related practice in current China, respectively. Section 4 will develop an environmental governance framework in which three questions asked above will be answered using the cost driven strategy. Section 5 gives out the primary conclusion and further research suggestions.

2. Environmental Challenges in China

For years, little was known about the pressures on the environment or the long-term effects of the economic activities in China. The environment was a resource to use and potentially dangerous consequences were ignored in the face of important political, economic or social considerations. The reality is that China faces great environmental challenges. In the past twenty years, China kept a rapid

speed of economic development with the trend of serious deterioration of its ecological systems on land, in airs, rivers and seas.

China’s material consumption is higher and its eco-efficiency is much lower compared to other developed countries. From the data in Table 1, the GDP per capita of China is about one-eighth that of Japan and one-tenth that of US. However, the material intensity of China is 36 times that of Japan and 19 times of that of US. The gap of material-use efficiencies between China and the developed countries is huge.

Table 1: Global Comparisons: Eco-efficiency

	China	Japan	Austria	Netherlands	Germany	USA
Population (Million)	1250	127	8	16	82	273
Area(thousand km ²)	9597	378	84	41	357	9364
Population density(Per km ²)	134	336	98	466	235	30
GDP(10thousand US\$)	980.2	4078.9	210.0	384.3	2079.2	8351.0
GDP per capita	3291	24041	23808	23052	22404	30600
GDP per are(10 thousand per km ²)	10.2	1079	250	937	582	89
TMR(million ton)	50000	5461	560	1056	6150	21840
TMR per capita(ton)	40	43	70	66	75	80
NAS ton	16	9.7	11.5	8.3	11.5	7.7
Material intensity (kg/ us\$)	51.01	1.34	2.67	2.75	2.96	2.62
Resource productivity (US\$/ton)	19.6	746.3	374.5	363.6	3378	381.7

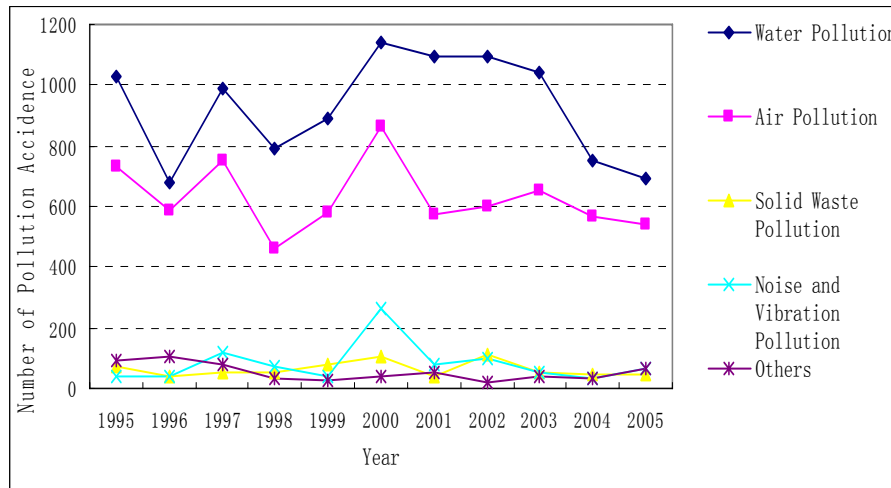


Fig 1. Number of Pollution Accidents in China

According to the pollution accidents reported in China (fig 1), there are more than 1000 accidents every year, among them there are 400 serious pollution accidents from 2000-2005, imposing significant negative impacts on the society, economy and environment. These frequently occurred accidents reflect low level of environmental management. However, in the 11th five-year plan (2006-2010), the central government sets up national objectives of pollution control and energy saving, including a reduction of COD and sulfur dioxide by 10%, as well as a improvement of energy efficiency by 20% at the end of 2010. These objectives would be very difficult to achieve if the economic structure and environmental governance make no dramatic changes in these years.

3. Corporate Environmental Management Practices

In the past decade, CEM becomes one of the most important environmental policy initiatives in China. There are a few CEM related practices implemented in China, either formally or informally. Currently, the implementation of Cleaner Production Promotion Law since 2003 has been one of the most popular CEM related activities, though its effectiveness has been doubted and criticized by officers and scholars. Another popular activity is the promotion of ISO14001 EMS certification program, which is attractive to managers because of its potential market value in adding green image to the enterprises. A few corporations, especially large scale or multi-national companies would like to public “sustainable development report” as one of environmental strategies. Governments at various levels, especially State Environmental Protection Administration (SEPA) named environmentally

friendly enterprises every year, tending to set up some model companies.

Since the beginning of 1990s, the Chinese authorities have been challenged by the public. The media, academic institutions, non-profit organizations, and the individuals demand better information about the state of their environment and express a desire to influence public policies. The government increasingly recognizes the potential of these alternative forces and takes steps to encourage it. Recently, a more systematic mechanism for disclosure of environmental information has been used by central and local governments to influence the environmental behavior of enterprises. An example of a successful application of environmental performance rating and information disclosure scheme in China is “enterprise information disclosure program”. Since late 1998, SEPA, together with experts from the World Bank and Nanjing University, have worked together to establish a “Green-Watch”, a public disclosure programme for industrial polluters. Adapted from Indonesia’s PROPER, the Green-Watch rates industrial environmental performance from best to worst in five colors – green, blue, yellow, red, and black. The Green-Watch draws on five principal sources of information: self-monitoring reports, inspection reports, records of public complaints, regulatory actions and penalties, and surveys that record characteristics of the firms that are relevant for rating environmental performance. The rating system incorporates emission information for 13 regulated air and water pollutants. Pollutant discharges are rated by total quantity and concentration. Solid wastes are rated in three dimensions: production, disposal, and recycling. The rating process involves a detailed account of a firm’s behavior in several dimensions. Environmental management is graded with respect to: timely payment of pollution discharge fees, implementation of the National Pollutant Discharge Reporting and Registering

Programme, the Standardized Waste Management Measures, and other administrative regulatory requirements. Internal environmental monitoring, staff training and internal document preparation are taken into account. In addition, the rating system considers the efficiency of resource use, its technological level, and the quality of its environmental management system. The ratings are disseminated to the public through the media. Municipal-level pilot Green-Watch programmes have been implemented. Reaction to these programmes has been positive and Jiangsu Environmental Protection Department had been actively to promote the program in the whole province. Since then, SEPA started to launch pilot programmes in other areas, in preparation for nation-wide implementation of public disclosure. In 2007, after a national-wide pilot programmes, SEPA issued its “ordinance for environmental information disclosure” which will be effective since May 1st of 2008.

The rating scheme is comprehensive, voluntary and offers participants an opportunity to discuss

their rating with the authorities before it is disclosed. After being set, the ratings are sent to the programme's Steering Board for final checking and ratification prior to public disclosure. To ensure accurate press reports, journalists are invited to a detailed presentation on the programme, including an explanation of the rating system and demonstration of the software that is used for ratings development.

A new information and CEM related policy, the community environmental roundtable meeting, is being designed and tested in Jiangsu Province since 2006. This programme tries to get multi-stakeholders, such as residents, the owners of the enterprises, the officials in different governmental sectors, into the meeting. The participants focus on one specific environmental issue, communicate with each other following specific procedures, and finally reach a contract. A feedback mechanism is established for supervising the contract's implementation. This institution is exploring a new way for multi-actors to supervise the enterprises' environmental behaviors and give pressures on them.

In 2007, SEPA, the People's Bank of China (PBC) and the China Banking Regulatory Commission (CBRC) enacted Green Loans Policy to reduce loan risk and enforce stricter environmental protection regulations. This policy regulates that the commercial bank should stop loan for enterprises in the "environmentally controlled regions and watersheds", where all the projects will not be given environmental approval such as EIA statement. Moreover, the commercial banks such as Industrial and Commercial Bank of China (ICBC) should require their branches to increase evaluation and post-evaluation for projects that may cause environmental pollution. Also, in 2007, the Ministry of Commerce regulates that the exports will be banned for environmental violations and subsidies and refunds will be reduced for exporting environmentally unfriendly products.

4. CEM in China: Cost-driven Strategy

More and more CEM related practices are carried out in China currently. In this section, we are trying to develop an analytical framework.

4.1 An analytical Framework of CEM

As defined by OECD, CEM comprises of three steps. The first step is the issuance of a policy statement, which outlines the basic principles and norms for the company's environmental management and performance. The second step is to put in place formal management systems designed to control the environmental impacts of their operations, including production processes and outputs. The last step is a

commitment to environmental performance reporting (OECD, 2003). These three steps describe the contents and processes of enterprises' implementing CEM.

In the above explanations, it seems that the enterprises are the main actor of promoting CEM. However, enterprise is not the only 'actor'. From the perspective of environmental governance, the government is the core actor among all of them (UNDP, 1997), especially in centralized China. It is the government who decides which governance model will be taken. It depends on the government whether or not to induce "market" and "civil society" into the governance system, and whether to establish partnerships between them with specific institutional arrangements. CEM is one of the institutional arrangements for the actors to communicate with one another. CEM is promoted by the government, implemented by enterprises and supervised by civil society and the market. CEM promotion indicates that the government wants to change from "command and control" policy to more integrated and flexible management (figure 2). In this new governance model, more actors, such as the government, the enterprises, the civil society and the market, take part in enterprises' environmental management

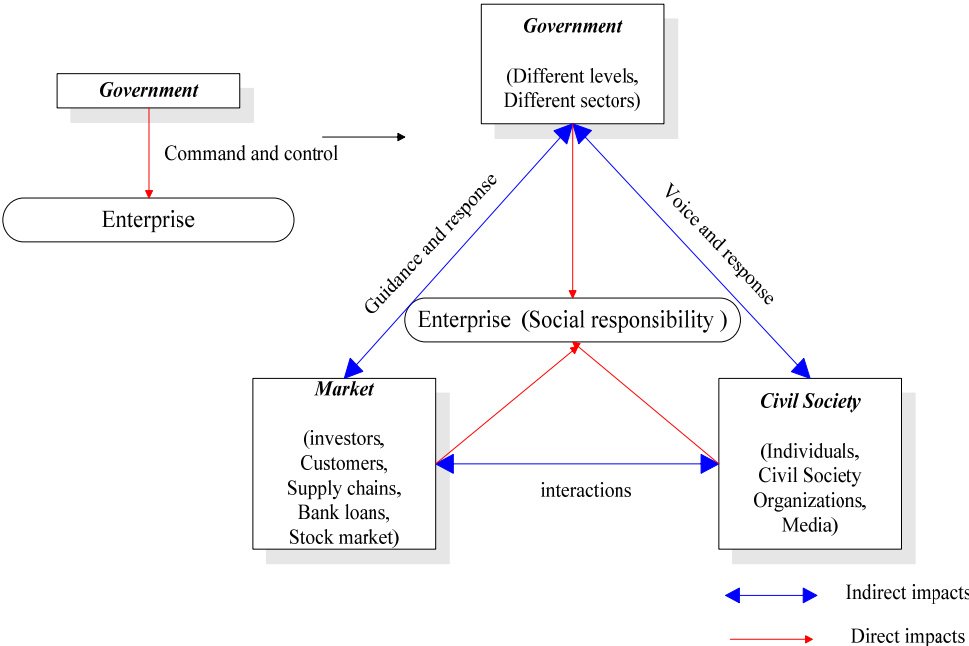


Fig 2. Governance model in current China

4.2 Why There Is A Dramatic Change of CEM in China?

As we describes in section 3, there are many CEM related practices promoted by Chinese government. To find the incentives of the government, we use a classic EKC model to demonstrate the relationship between the environmental deterioration and the economic development. In the early stage

of development in China since late 1970s, when the priority is given to economic development, the balance between benefits (e.g. rapid economic development, better quality of life and power of the country) and costs of weak compliance (e.g. environmental quality deterioration, climate changes, public discontents, and international environmental pressures) was accepted by both the public, the government and the industry. In recent years, with a new target of building a sustainable and harmonious society, there is a different value system in regard to above costs and benefits. The changing cost-benefit equilibrium can only be achieved by a more balanced and integrated environmental governance framework, within which enterprises' environmental compliance must be enhanced.

To enhance firms' compliance, traditional command-and-control and economic incentive tools still play a critical role, which will encourage the firms to improve their performance to avoid costs associated with compliance. On the other hand, the authorities directly initiated some voluntary programs such as "enterprise environmental information disclosure", or encouraged companies to develop their own voluntary program such as "sustainable development report system". By doing so, firms can significantly reduce the costs of compliance and help the achievement of new cost-benefit equilibrium.

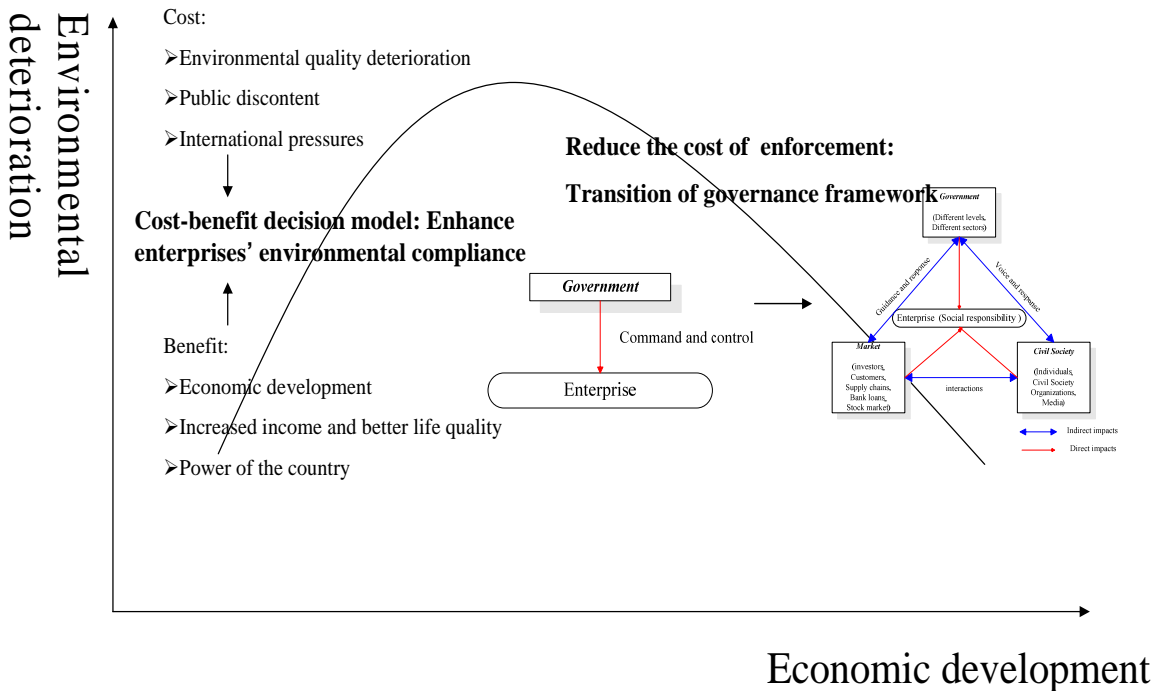


Fig 3. A Cost driven explanation for promoting EMS

4.3 Effects on enterprises' decision-making process

The adoption of CEM will have significant impact on the decision-making process of firms (fig4).

In current integrated governance framework, firms will find the cost of violation is very high due to stricter discharge standards and stronger enforcement with more advanced monitoring system.

Therefore, there is a strong trend of compliance. Secondly, the government is providing more channels for actors such as investors, customers, the suppliers and the stock market to obtain environmental information of the enterprises, firms undoubtedly have to improve their environmental performance to prevent from losing market share and values. Third, with the growth of income level, the civil society such as the residents, the NGOs and the media would like to know more about their neighbors' environmental performance. A bad environmental behavior will damage the reputation of the firms and cause social conflicts between the public and the polluter. To avoid potential cost and benefit from environmentally friendly images, firms incline to improve their environmental behaviors and will voluntarily disclose their good behaviors and efforts to the public.

In a word, to avoid or reduce the costs caused by multi-actors, enterprises prefer compliance other than violations, and take serious social responsibilities by "greening" its decision-making process via performance improvement and information disclosure. Solutions are included but not limited to eco-design, resource reuse, adoption of ISO 14001 EMS, cleaner production audit and information disclosure.

CEM, through better management practices in firms, can play a major role in addressing many environmental problems. The accumulation of individual firm's better performance will finally increase local environmental quality. It will fundamentally change current environmental governance framework by building a partnership among the government, the enterprises, the market and the civil society.

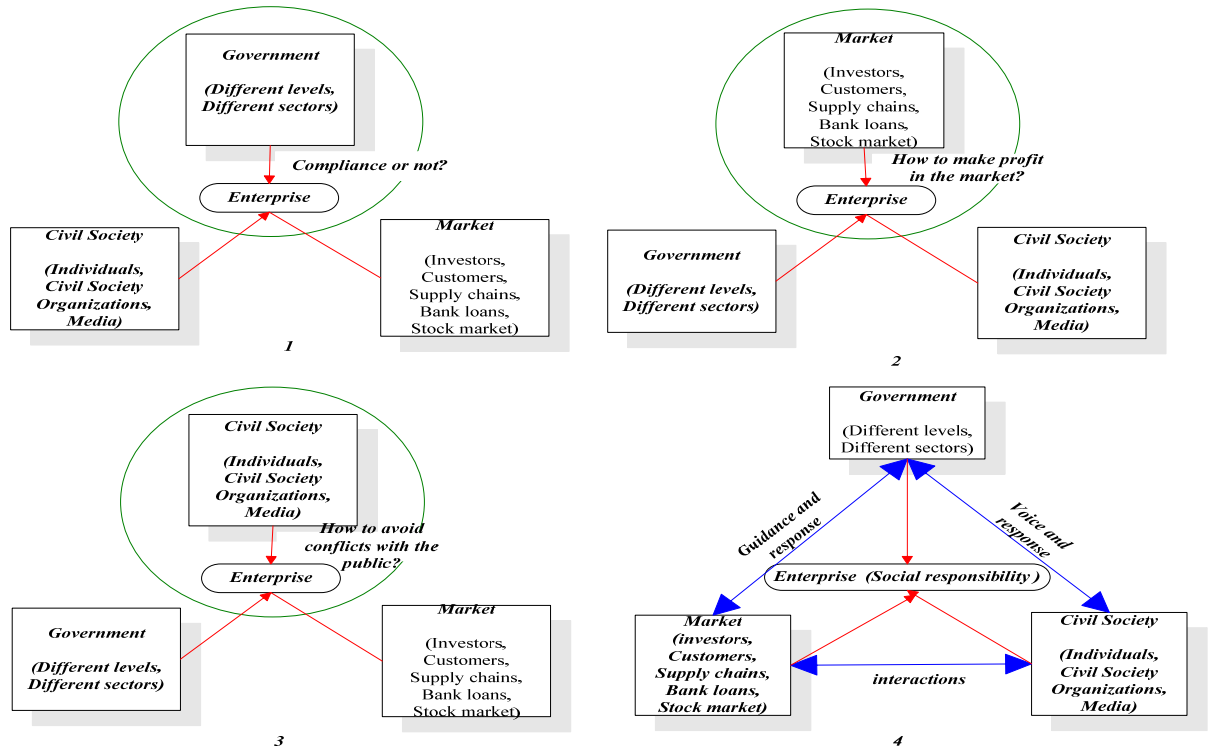


Fig 4. Influences on the Enterprises' Decision-making Process

5. Research Suggestions

Using a governance framework to analyze current CEM practices in China has its advantages by integrating other than isolating CEM as an effective policy tool within current environmental management system. In future's research, except for an in-depth theoretical analysis, a comparative study between China and other developed countries is needed. What is more, an empirical study based on field interview and questionnaire survey is strongly suggested so as find the problems and potential improvements in regard to CEM in China.

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Corporate Environmental Management in Thailand

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1. Introduction; Profile of Thailand

Thailand is situated in Southeast Asia region with 510,000 square kilometers of area and approximately 65 millions populations. Thailand is, in facts, a lower middle income industrial developing country, which has Gross Domestic Product (GDP) at 223 Billion USD, of which 90 percent are generated from industrial and service sectors. The other 10 percent come from agricultural sector.

In the past, Thailand's economy relied upon agriculture; however, not longer than 20 years ago, the country had started to evolve the economic dependency from agriculture to industry. At present, economic is driven by industrial and service sectors. Regarding the economic growth, in the past 20 years, Thailand can be so called to be one of the fastest growing economic nations in the world; however, the growth rates are not constant and are slowed down by various reasons, such as the economic crisis in Asia in 1997 and internal political uncertainty.

The aspect of environment, Thailand has faced various environmental problems: air pollution, wastewater, and waste are some examples of the critical issues. Nowadays, Thailand, in terms of air pollution has received air pollutions from 2 major sources, which are transportation and industry sectors. This problem becomes more prominent in big cities and cities where numerous numbers of factories are located, such as Bangkok, Chiangmai, and Rayong provinces. Furthermore, one immerging air pollution problem is transboundary haze; however, the problem is a seasonal and area-specific problem.

On the wastewater issue, it is one of the environmental concerns for Thailand. Wastewater from point sources, in terms of volume, agriculture, household and factory are the primary polluters; however, household and factory sources are more important, regarding the loads pollution and treatment. Based upon 2 sources: household and factory, the former generates approximately 14 million cubic meters per day and the latter produces wastewater about half of the former.

Solid waste in Thailand is the other environmental issue coming into public's attention since the increasing of waste quantity became prominent, especially in large cities while the collection capability could not be built to catch up with the increasing waste amount.

Consequently, there are uncollected solid wastes resulting from the increasing wastes and low collection capacity.

2. Environmental Management in Thailand

In Thailand, environmental management has been taken into the actual practices shortly after the emergence of industrial development. Thailand has gone through various stages of environmental management including enforcement and voluntary. Considering environmental management practice in Thailand can be classified into 3 stages. Details of environmental management in each stage are described, as follows.

In the first (initial stage) of environmental management period in Thailand, it was started almost the same time with the industrial development period and was ended by the end of 1992. In this period, environmental management was primarily done only through command and control system, which had governmental agencies enforce rules and regulations on industrial sector and other polluters. Regarding the public participation was hardly noticed in the period.

On the 2nd stage of environmental management in Thailand, which was in the period of 1992-1995, the application of command and control was still implemented; however, the practice of environmental management was broaden by acquiring more environmental awareness, more of participation of related parties including public and private sectors, and more voluntary of industrial sector. This period can be called to be the beginning of the actual application of Corporate Environmental Management (CEM); however, the application of CEM was not fully applied and not sustainable resulted in unclear picture.

The 3rd stage of environmental management, which was begun in 1995, is the current phase of Thailand. This stage is the stage where all environmental management tools are in place, including participations from the public. The environmental management in this stage is more sustainable comparing with others; however, the environmental management itself requires stronger enforcement, more environmental awareness, more voluntary, more public awareness, as well as more importantly Extended Producer Responsibility (EPR) and Greening Supply Chain.

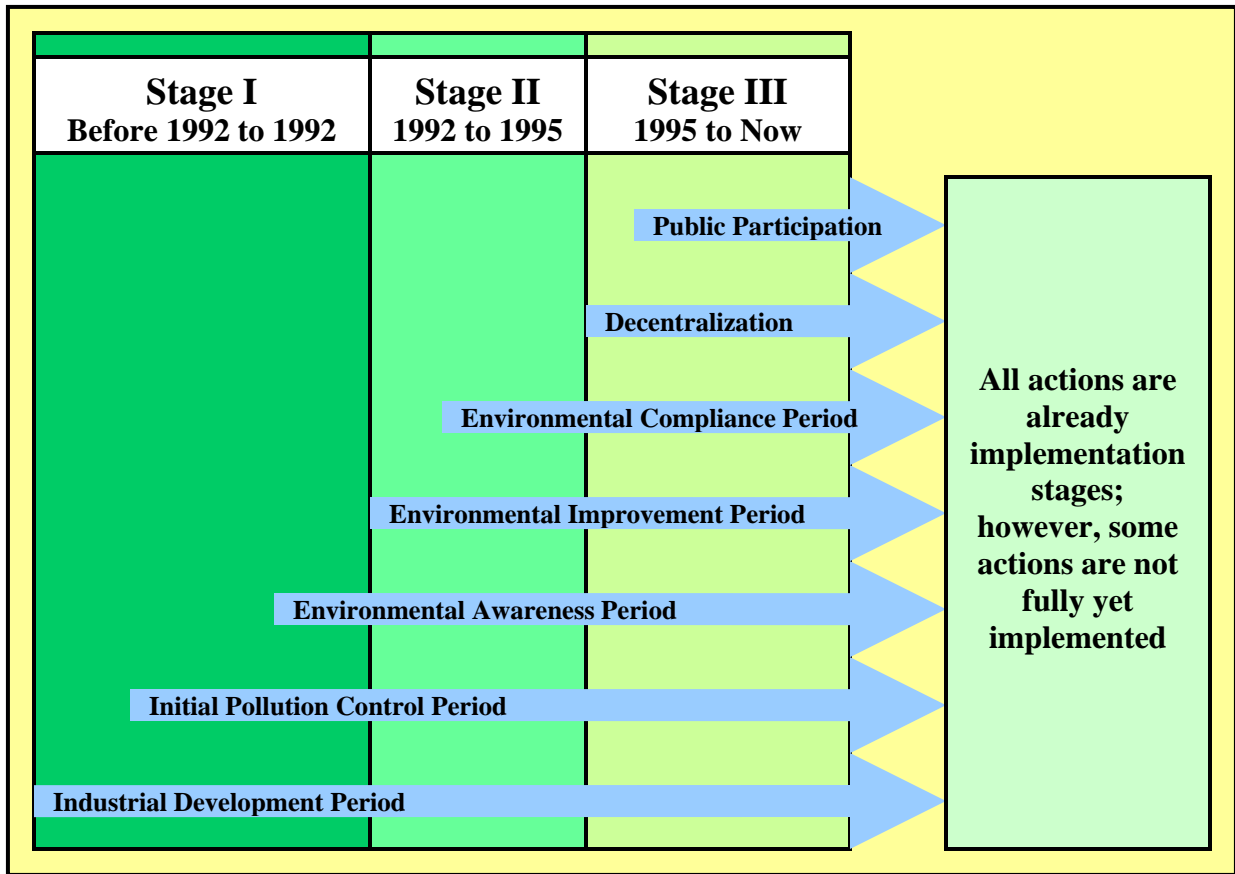


Fig. 1 Environmental Management in Thailand

3. Corporate Environmental Management (CEM) in Thailand

Corporate Environmental Management (CEM) in Thailand has already started. The implementation of CEM is usually applied through the application of Corporate Social Responsibility (CSR). During the initial stage in Thailand, multinational and large corporate is the first group who adopted the application.

At present, even the application of CEM is more widely adopted and practiced in the country, the application is still limited in large corporate. In Small and Medium Enterprises (SMEs) group, most of the entrepreneurs do not take CEM into their consideration yet; however, CEM started to play a crucial role in the group since the supply chains that SMEs have with the multinational and large corporate. Generally, assistants from multinational and large corporate regarding CEM were given to the SMEs, in terms of activities, such as training, sharing experiences, and award.

4. Case Study

In terms of good practices of voluntary initiative on CSR greening supply chain, and environmental production in Thailand, some examples are set to be case studies showing in this paper. There are 2 sectors, in this paper, setting to be case study, which are food production and automobile sectors.

4.1 Food Production Sector: Chareon Pokphand Foods (CPF) PLC.

- CPF profile

Chareon Pokphand Foods (CPF) PLC is the largest food company (production and sell) in ASEAN, which has business on both agriculture and livestock. Their business includes selling pigs and pig breeders, as well as raw pork and cooked pork. The investments of the company are made in Thailand and other parts of the world. Regarding the financial income, the total sell in 2005 is 3,200 million USD.

- Details of the project

The project is implemented in Nong Wa district, Chachoengsao province, which is situated the central part of Thailand and close to Bangkok. The CPF started to see a poverty problem caused by lacking of land ownership, lacking of knowledge and drought of the local people who earned their living by agriculture. Consequently, in 1977, the CPF began to develop the project with collaborations from the local agricultural cooperative, central government by the Department of Agricultural Extension, local governments, and Bangkok Bank.

The objectives of the project were for 3 primary objectives, which are listed as following:

1. Develop integrated agriculture for increasing incomes;
2. Form effective management system in agricultural cooperation;
3. Preserve fertility of lands and prevent slash and burn agriculture.

The primary activity of the project is to do pigs farms with a total area at 495 acres by having 50 farmers joined the project. By joining the project with CPF, farmers have to sign 10-years contract, which includes various detail listed as follows:

CPF provides

- House and school
- Farm
- Supply: breeder pigs, pig food, and medicines

- Management knowledge
- Guarantee for
 - Minimum of pig price of labor based on number of pig
 - Minimum incomes:
 - The first 10 years (During Dept): 7,500 Thai Baht/month
 - After the first 10 years: 20,000 Thai Baht/month
 - Setting up cooperative in the village

Bangkok Bank

- Loan by having CPF is a collateral security guarantee for the loan

Central and local governments

- Utility
- Knowledge

After 10 years, the farmer will own 9.5 acres of land, 30-pig capacity farm, and house

The joined farmers have to be responsible for breeding and raising pigs until pigs have the weight at 18 kilogram (about 8 weeks old). These pigs will be sent to a central farm for another step of feeding, which is operated by CPF.

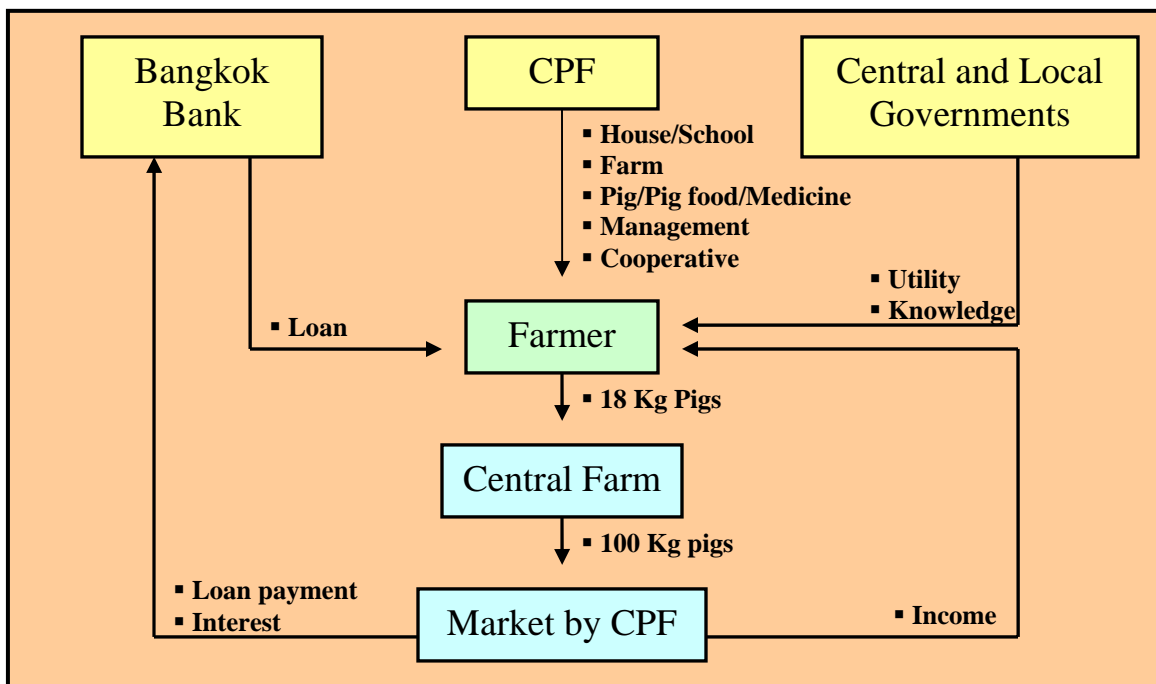


Fig. 2 Details of the project of Chareon Pokphand Foods (CPF) PLC

Besides feeding pigs, there are other opportunities promoted by CPF for supplementary jobs. Growing mango trees and selling sludge left after biogas production are the examples of the supplementary jobs. Mango fruits and sludge are sold to the market created revenue for the farmer.

On the environmental term, it can be counted that pig farm is a zero waste farm, since the excrements of pigs are used to produce biogas. Additionally, sludge from biogas fermentation is used as a fertilizer and is sold for additional incomes.

The outcome of the project is very successful, in terms of both economic and environment. On economic aspect, the farmers and their families who joined the program have better job security, quality of life, supplementary jobs ,and more importantly, more incomes. For the benefits of environment, pollution reduction in pig farms is being uplifting by the biogas production process. In addition, natural resources in the area are improved as well.

- What will be investigated?

Since the project was started in 30 years ago by CPF itself, while there was no regulation, no mandatory, and no social pressure existed regarding social and environmental responsibilities, but the CPF did initiate, proceed and maintain this successful project. As a result, some worthwhile questions should be interrogated are listed as follows:

- What is a mechanism driving the project?
- How CPF makes the project works?
- How CPF maintains the project?

Tools for investigating answers with private sector are interview and questionnaire. Consultation with governmental sector will be a requirement as well.

The expected outcomes will be the policy simulating the mechanism of CPF's project. The further activity after coming up with the policy will be dissemination of the policy in food production companies nationwide.

4.2 Automobile Sector: Toyota Motor Thailand

- Toyota Thailand profile

Begin with a short profile of well-known company-Toyota Motor Thailand, Toyota Motor Thailand is a Japanese company ranked one of the largest vehicle production companies in Thailand. The total sell in 2005 is 300,000 million Thai Baht.

- Details of the project

With the fundamental vision of Toyota Motor Thailand on the environment, the company will continue on developing environmental management system parallel with the growth of company in Thailand. Consequently, the company took their steps on the higher level of the environmental management, in terms of greening supply chain and eco car, which the latter is not just only energy efficiency car, but environmental friendly as well.

Toyota Motor Thailand did implement greening supply chain through out the existing supply chain, which is composed of 153 companies. Initially, in 2002, the number of supplier who obtained the certification of ISO 14001 was 37 companies. Later, with the assistance of Toyota Motor Thailand by creating training and activities for its suppliers, the number of certified supplier was substantially increased to 146 companies in year 2005, which is counted for 95% of the total suppliers.

Eco car is the other important concept that the company put it into practice. Eco car for Toyota Motor Thailand includes actual environmental application and energy efficiency. The company started to use recyclable materials for car parts, use recycled materials in cars, minimize the use of toxic substances, and stop using substances of concerns in some car productions. Furthermore, cars produced by the company have energy efficiency and meet the emission standard as well.

▪ What will be investigated?

Since the environmental friendly application of the company was successfully applied, both concepts-greening supply chain and eco car are worth considering for setting policies, which can possibly be applied to automobile sector.

In order to setting appropriate policies, some questions need to be answered:

- How Toyota helps suppliers improving their environmental management through supply chain system?
- How Toyota incorporates Eco concept in a car production line?

Tools for investigating answers on these questions with private sector are interview and questionnaire. Consultation with governmental sector will be a tool as well.

The expected outcomes will be the policies simulating the mechanism of greening supply chain and eco car. The further activity after setting up the Policies is the dissemination of the policies in automobile sector in Thailand.

Potentials of Corporate Environmental Management as Effective Policy Tools for Sustainable Development in Japan

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1. Introduction

As of today at the end of the year 2007, Japan is 13% behind to reach the Protocol which is named after its own traditional city; Kyoto Protocol which is aimed at reducing global CO₂ emission (Fig.1). The latest report of green house gas (CO₂, CH₄, N₂O, HFC, PFC, and SF₆) emission in 2006 indicates that CO₂ emissions from all but industrial sectors have increased compared to those in 1990 (MOE, 2006). The industrial sector (other sectors are transportation, business offices, households, and power generation sectors) has reached -5.6% of the 1990's CO₂ emission level despite of the increased production levels. This improved efficiency per production has been attained with industrial sector's voluntary commitment as a main driving force toward sustainable society.

In this short paper, Japanese industrial sector's efforts and related national environmental policies will be briefly introduced as one of the successful cases of the corporate environmental management (CEM). Hereinafter, this voluntary corporate environmental management will be called corporate environmental management (CEM) as defined in another part of this publication. This paper will be (1) showcasing the successful cases in Japan, (2) discussing motivations, benefits, and risks behind the voluntary efforts, and (3) extracting relevant research focuses for this IGES project.

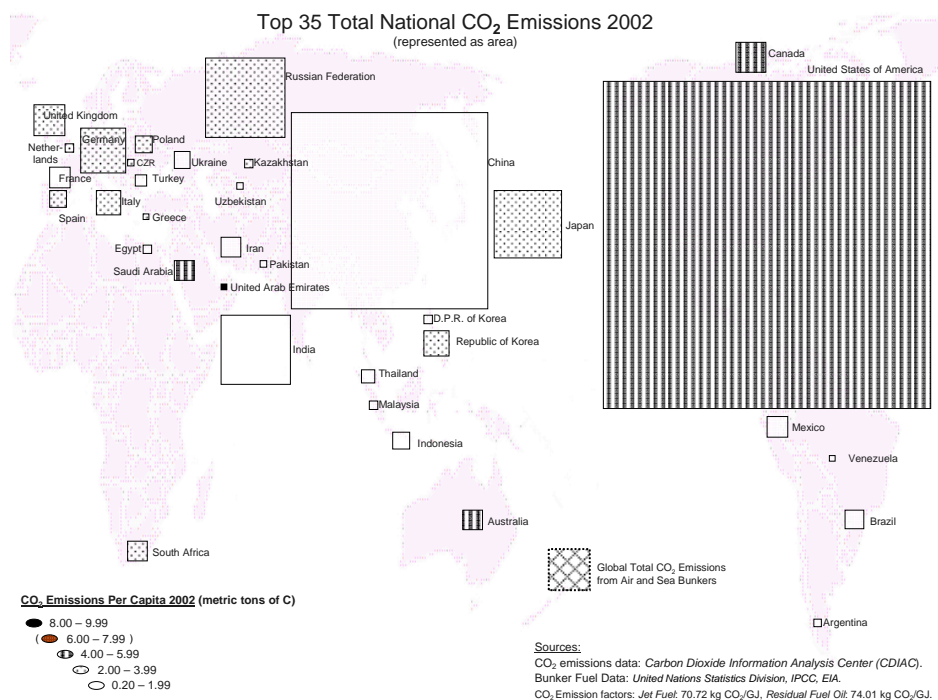


Fig. 1 National CO₂ emission from Top 35 countries and the total air and sea bunker fuel consumption

[Ntenta, 2006]

First of all, it should be recognized that private sectors contribute to social development at a frontline of the economic value-creation competition. Private sectors provide inexpensive and good quality of services and products in a very competitive market, maintain their sound financial statuses, pay corporate tax, invest for the future, pursue technology and business efficiency, improve employees' morals, guarantee good quality of life for employees, and comply with various regulations. In addition, voluntary corporate environmental management is further demanded to renovate the society to a more sustainable one.

2. CEM in Global Warming Mitigation

CO₂ emission reduction, among various environmental and development issues such as Millennium Development Goals (MDG) by 2015, is the most pressing issue due to its long term creeping impact and scale of the global warming problem.

Nippon Keidanren (Japan Business Federation) is one of the largest economic associations in Japan, and has played a key role to encourage its 1,662 members (1,343 companies, 130 industrial associations, and 47 regional economic organizations) to be engaged in CEM. One of the successful efforts is the accomplishment of the voluntary CO₂ reduction plans in some business categories. According to the latest report on the effectiveness of its global warming voluntary countermeasures (Keidanren, 2006), the member companies from 35 business categories which participated in the survey account for 45% of the total CO₂ emission in Japan, and 84% of the industrial sector and power generation sector. Nippon Keidanren claims that the total emissions since 2000 (-1.5% of the 1990 level) have reached the Kyoto mandate (Fig.2). In 2006, even -3.5% could have been reached if a nuclear power plant had not shut down. Some could argue the trade off risks of global warming and nuclear waste disposal, but it is not a focus in this paper.

Although the characteristic nature of the Japanese society that tends to follow no matter what other members of the society are doing cannot be ignored, cost-cutting and technical competitiveness in the Japanese market are the main driving force of such successful CO₂ emission reduction. It is environmental policies that are playing a supportive and monitoring role to promote CEM.

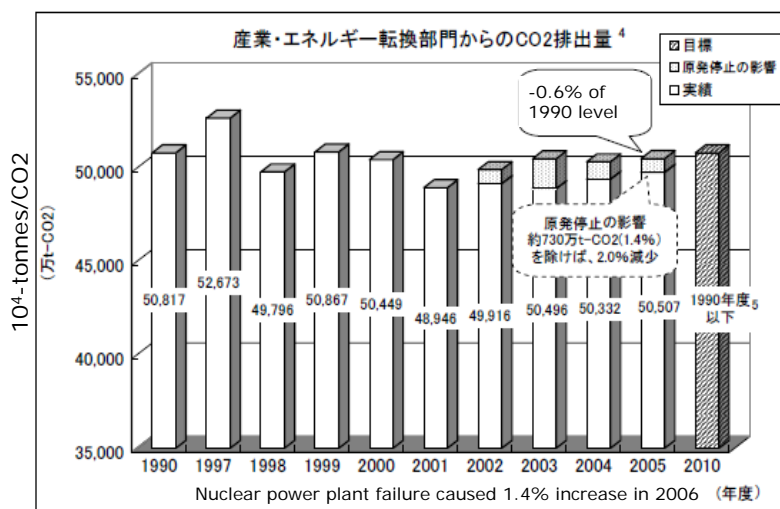


Fig.2 CO₂ emission from industry and power generation sectors summarized by Keidanren

The Global Warming Prevention Headquarters of the Prime Minister Office of Japan recently reviewed Japan's emission reduction policies. It was concluded that further promotion and policy enhancement commensurate with the predicted emission increase range between 0.9 – 2.1% by 2010 are indispensable to achieving the Kyoto Protocol by the end of 2012. Particularly, policy focuses will be given to work offices and households from which CO₂ emission has increased by 41.7 and 30.4%, respectively, compared to those in 1990.

In response to the review results, eight industrial sectors (Electric associations, Japan Glass Bottle Association, Japan Franchise Business Association, etc.) which have already achieved the voluntary goals have tightened the goals which amount to further reduction of 0.22%. Overall, while 21 sectors have achieved the goals, 12 sectors have not such as paper, steel, bearing, rubber, automobile parts sectors, etc.

The Prime Minister Office has identified other industrial sectors which would be requested to have CEM plans. The sectors include entertainment, credit union and securities, information service, waste management, newspaper, Small Scale Power Producer and Suppliers, hospitals, educational sectors, etc. On-going policy discussion include adoption of so-called top-runner policy in more industrial sectors, engagement of medium to small scale offices and franchise chain stores, and support of industrial efforts to reduce 3 GHG substitute gases (HFC, PFC, and SF₆).

One of the associated regulations is Act Concerning the Rational Use of Energy (Act No. 49 of June 22, 1979) of which the latest revised version entered into force in 2006 (ECCJ, 2005). The main targets of the revision are to engage more factories (11,200 -> 13,300 factories), manufacturers, and transport operators to make energy saving plans and report the results of the voluntary efforts, to further apply the top-runner policy for 21 equipment including liquid crystal displays, plasma TV, DVD players, to consolidate energy-saving efficiency labels of electronic products with energy and cost-saving information, and to strengthen responsibilities of energy managers who factories and manufacturers are obliged to have depending on the scale of the facilities.

As seen in the above, CEM comprises significant part of the government's policies and regulations. CEM is promoted by the government. Incentives are given to top-runners by making the top efficiency as the standard of the near future. CEM efforts and results must be reported to the government. Penalties include disclosure of company names with poor efforts and results, legally binding recommendations, and limited fines.

3. Research questions on CEM

One of the short-term policy research questions to be raised is whether or not CEM is an effective policy tool to reduce CO₂ emission from business offices. Although business offices are more manageable than households in a sense that corporate policies could be consistently implemented throughout the organizations, there are essential differences between energy consumption natures of factories and business offices. In addition, there are many obstacles to be researched such as owner-tenant relationships, insulation installation defect, work office occupational regulations, a lack of utility meters and related facilities to understand and control utility supplies to each tenant, etc. In this area,

renewable energy promotion rather than energy-saving approaches could be more pragmatic. Japan needs to enhance its renewable energy policies, as both the current renewable portfolio and future goal in 2010 are poorer than those other developed countries such as USA and EU.

Another potential long-term research focus is to set out the CEM's limitations as well as policy needs to unlock the CEM's potential for achieving low-carbon society. CEM encourages private sectors to go beyond the regulations and policies. Such private sectors, if larger ones, could influence some business structure changes among stakeholders. However, without policy support and the resulting socio-economic restructuring, CEM's unit costs to reduce CO₂ emission would exceed reasonable prices at some point. Some EU countries and Japan have expressed some potential scenarios to reduce CO₂ emission by more than 50% by 2050. The scenario targeting 70% reduction in 2050 that has been proposed by the Japan's National Institute for Environmental Studies counts 20-40% and 40% reduction from the emission level in 2000 in industrial sector and business office sectors, respectively (NIES, 2007). Such drastic changes within the period of 40 years would be never possible without convulsive efforts by the target sectors. CEM will be definitely one of the effective policy tools for the post-MDG era's environmental governance. In this sense, potentials and limitations of CEM need to be further explored to specify the policy needs to make that change happen.

4. Benefits and risks of CEM

Benefits of the CEM could include, *inter alia*:

- Contributing to sustainable society;
- Increasing efficiency and reducing costs;
- Staying competitive at the cutting-edge of the latest policies, technology and concept development;
- Promoting communications and sharing experiences with stakeholders and clients;
- Encouraging employees' voluntarism leading to human resource development;
- Improving the company's images/brands;
- Providing opportunities to bring external views to improve business operations.

Most of these benefits could not be gained if a company does not disclose the information and share the results with the stakeholders and societies where it belongs.

Another research focus could be CEM risk assessment which would hopefully encourage private sectors to be more easily engaged in such activities. The followings could pose to private sectors risks that could be potentially accompanied with CEM benefits:

- Information / data quality problems
- Service / product liability issues;
- Disclosed information on non-compliance with voluntary / internal standards
- Consumer/neighbor's negative impression when voluntary efforts discontinue.

Private sectors are held accountable on voluntary corporate environmental management once it's announced to the public even without legal reporting mandates. How about information recipient attitude toward disclosed information on such activities? Are the activities fairly assessed, and such

efforts are reflected into the consumer and stock markets? What if some companies honestly disclose failure of such voluntary activities, and information recipients heavily criticize such failure? A society that is incapable of respecting disclosure of negative information would not encourage private sectors to disclose such information. Business management failure needs to be criticized in a professional manner, but the atmosphere to disclose the information should be nurtured in the every aspect of the society to promote CEM toward sustainable society.

5. Consumer education for sustainable development as one of the CEM's elements

In the developed countries' markets voluntary corporate efforts are more accepted in assessing corporate values. Such market is aspired for by "The Evolution of Market" published by Japan Association of Corporate Executives (Keizai Doyukai, 2003), and more proactive roles should be sought by private sectors. Such efforts should be regarded as investment instead of costs.

In further developing this discussion, consumer education should be recognized as an important area to evolve the market to achieve sustainable society. In Japan consumer education is more recognized as education to protect consumers from frauds and crimes. However, as the latest revision of Japan's Act Concerning the Rational Use of Energy mandated private sectors' efforts to provide information to consumers, consumer education will become significant part of the CEM mainstream. This emerging trend in Japan is in line with the international milestones the UN Decade of Education for Sustainable Development (2005-2014) as well as The Expansion of the United Nations Guidelines on Consumer Protection to Include Sustainable Consumption adopted in 1999. Consumer education must be also recognized one of the consumer's rights and mandates in the near future in order to achieve sustainable society.

6. Public-Private Partnership as one approach to consumer education

One approach to providing the consumer education opportunities could be made possible by initiating public-private partnerships. Although many types of UN-private partnerships (UNU, 2007) have been put in place such as UNICEF-Dannon Partnerships for drinking water projects in Africa as a recent example, I would like to take this opportunity to introduce some of the United Nations University's (UNU) partnership cases for higher education (Nelson, 2002). More Japanese companies are welcome to support consumer education projects as part of CEM activities.

- Shimadzu Case (<http://www.unu.edu/esd/manage/index.html>)

UNU-Environment and Sustainable Development Programme (ESD) partnership with Shimadzu Corporation is a dynamic relationship that has lasted for more than ten years. The main objective of the project is to enhance research capacity in developing countries. Shimadzu is providing financial assistance, laboratory equipment and training to ten institutions nominated by UNU under the Environmental Monitoring and Governance in the Asian Coastal Hydrosphere project, and UNU-ESD is responsible for the overall execution of the project (Fig.3).

Shimadzu Corporation has been a truly active project partner, collaborating on joint project design, implementation and evaluation in addition to its contribution of financial, technical and managerial resources.

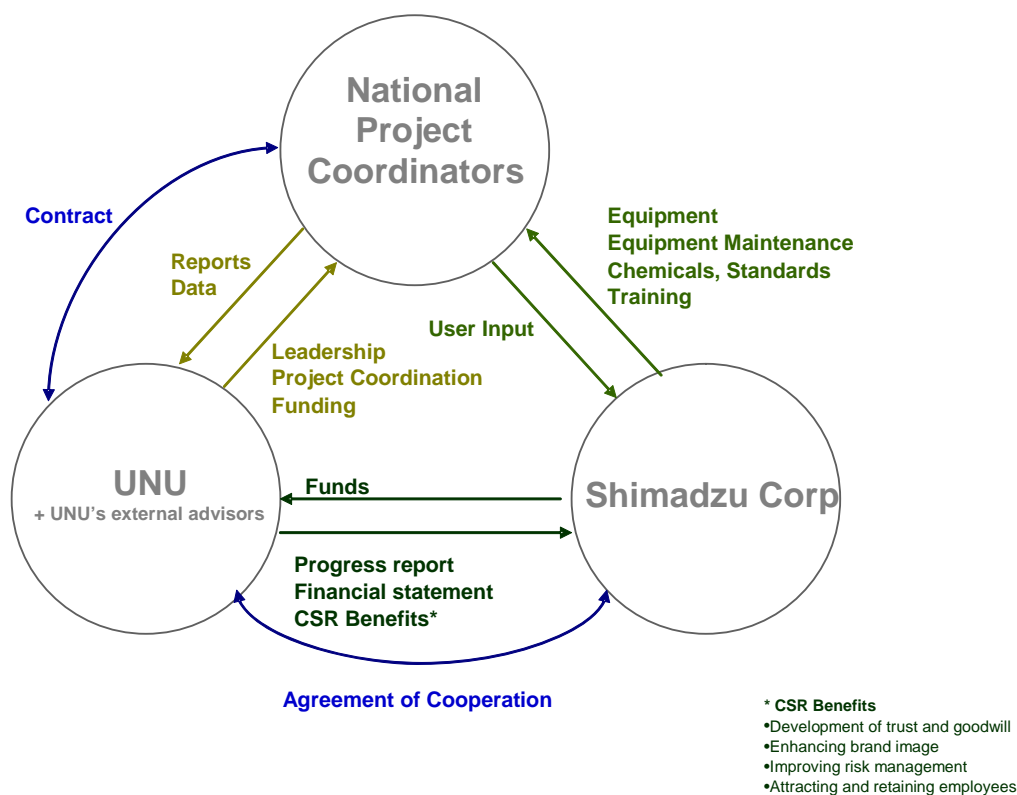


Fig.3 UNU Coastal Hydrosphere Project Partnership Operation Scheme

- Dialog Telekom Case

Access to rainfall information is of utmost importance for the agricultural sector to prepare irrigation plans and for the general public to prepare for natural disasters such as floods and landslides. Unfortunately, present monitoring methods are either highly expensive or involve manual observation and recording that is largely inaccurate. UNU, together with the University of Moratuwa in Sri Lanka, has entered into a partnership with the Sri Lankan telecom corporation Dialog Telekom in order to create an automated system that is expected to significantly improve the reliability and usefulness of rainfall monitoring. As a corporate partner, Dialog Telekom has equipped the University of Moratuwa with a Mobile Communications Research laboratory, funded a Master's Degree scholarship at the University and provided the project with free network access for the development of a prototype system. The United Nations University funds the project's registration fees and hardware development as well as supervises the research. The research will lead to a Master's Degree.

This public-private sector partnership is a good example of how corporations from developing nations may contribute to finding solutions to local problems and, by sharing the results of the project openly, to assisting in sustainable development solutions on a global level.

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Emerging Concepts of Corporate Environmental Management and A Research Outlook

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1. Introduction

Business plays a key role in sustainable development process, as its activity dominates every stage of daily value chain, from research into genetically engineered food, provision of important goods services, to the disposal of household and industrial waste. For doing so, it is engaged directly or indirectly, in the lions share of resource depletion, energy use and hazardous emissions that generate environmental concerns. Sustainable development based on triple bottom lines – a balance between environment, economy and societal welfare is of paramount importance for corporations. In simple terms, to be sustainable is to remain existence. This is most appealing notation to corporate managers, because over recent years a number of environmental problems have threatened the existence of business. Even though, the prime aim of any business should be to achieve its business goals, its activities should also directed to achieving environmental and social goals. Usually, they will achieve these goals essentially by their own driving force, but will also be influenced by external factors which successful firms will be able to either turn to their advantage or to assimilate into their business. Not only these external factors such as technological, economical and political influence the company in how it goes about achieving its business goals but they also influence how the companies achieve other objectives, such as reductions in environmental burden by individual companies, greater sustainable society and new servicing models.

Knowing the importance of understanding the inter-linkages between the business and the environment as well as devising enabling policy environment, the Institute for Global Environmental Strategies (IGES) - Kansai Research Centre (KRC) has been extensively working on these issues since its establishment in 2001. The thematic areas of KRC research projects are listed in Table 1. Major shift is made in 2007, when the focus of the research is turned to developing Asia.

Table 1. Past and present research at Kansai Research Centre

Project Name	Period	Theme	Geographical Focus
Business and the Environment	2001-2003	Environmental Accounting	Japan
Business for Sustainable Society	2004-2006	Local industrial systems and Business Models	Japan
Corporate Environmental Management	2007-2009	Pro-active Policies and Business Strategies	Asia

2. Growing Pressures for Corporate Environmental Management in Asia

Although Asia has produced enviable economic growth in the last decades, the environmental

sustainability has not stand the pace. As a major user of raw materials and a major source of pollutants and waste, the Asian business sector now exerts significant pressures on not only the regional, but also the global environment. This raises critical questions: What are the approaches by which the business industrial sector can reduce these environmental impacts and contribute proactively to sustainable development in Asia.

In industrialized economies like Japan, the first generation of emission and pollution control involved applying traditional legal remedies such emissions standards. But in developing Asia, Over time, it became clear that these traditional regulatory approaches to pollution control were excessively costly in some circumstances and incapable of achieving the stipulated goals in others. Failures have been especially common in many countries, where legal and regulatory institutions are often weak (ADB, 2005). In response to these deficiencies the second generation of pollution control focused on market-based approaches such as tradable permits, emission charges, deposit-refunds and performance bonds. In some instances they have substituted for traditional remedies, but in most cases they have complemented them. In developed countries like Japan, USA and Europe, these approaches have added both flexibility and improved cost-effectiveness to environmental policy (Blackman, 2007). Pollution charges have also contributed to improved environmental performance in developing Asia, with particularly noteworthy examples in Korea (ESCAP, 2007).

Even the addition of market-based approaches, however, has not fully solved the problem of weak governance. In the industrialized countries the system remains overburdened by the sheer number of substances to be controlled. Neither staffs nor budgets are adequate for the task of regulating all of the potentially harmful substances that are emitted by firms and households. In many developing countries like India and China, these difficulties are compounded by the problems associated with designing, implementing, monitoring and enforcing market-based regulations (Kathuria, 2006).

3. Business Case and other Motivating Factors for Corporate Environmental Management

There is widespread evidence that business entities radically adjust their environmental behaviour through voluntary approaches such as adopting efficient production processes, pollution abatement strategies, that also in partnership with governments and social groups. This positive role that Asian business can play in simultaneously meeting environmental and economic challenges by those voluntary initiatives has been recognized for some time (World Bank, 2004). Influenced by public policy regulations, supply chain pressure and non-governmental organizations/consumer activities, an increasing number of businesses in developing Asia recognize a competitive advantage to improving their corporate environmental management (CEM) activities.

But what constitutes CEM is not a simple question. For eg, Is a recycling plant that emits air pollution an environmentally responsible company? The simplest definition of CEM shall be actions undertaken by corporations to minimise the negative impact of their activities on both ecology and society. While, it involves a broad spectrum of activities ranging from simple measures to manage waste and pollution to proactive measures such as designing and managing energy efficient products over their life cycle including its disposal to minimise adverse impacts, for the purposes of this study it

is restricted to voluntary commitment of business to become environmentally responsible by moving beyond compliance as well as shifting its path from reactive to proactive. If planned in a right way, such CEM approaches can greatly support the sustainable development paradigm based on triple bottom lines. But evidences– both theory and practices is needed to develop new public policies and partnerships that can be effective in promoting voluntary measures.

Adoption of CEM measures depends on the nature of firm's business. Primary industries can make environmental improvements in the way they grow, harvest and prepare it for further processing or final market. Manufacturing industry can adopt CEM for making changes in their production process and/or by deciding to make and sell eco-products. Service industry has less choice, having to focus environmental impact by substituting with better alternate goods and services. What are the benefits of adopting corporate environmental management activities? Many studies have focus on the link between public disclosure of environmental performances and share prices (Dasgupta et al, 1997; Dasgupta et al, 2004). Overall the answer has been positive, but business response to these findings has been somewhat sceptical, perhaps because business managers clearly understand that environmental friendly operations increase profits only sometimes. Several approaches can be taken to better integrate environmental considerations into business strategies. Corporations can often find cost savings through more efficient use of inventory and through waste minimization, recycling and reuse (UN, 2001). The method by which corporations can simultaneously derive environmental and business benefits is pushing for private standards or for new government regulations that favour particular CEM operations. Private standards are developed when corporations in a similar sector come together to establish tougher environmental performance conditions, by having voluntary codes. Companies that participate in such programs gain competitive advantage over non participants by creating a cleaner image and reducing risks and compliance costs (Arora and Cason, 1996).

Corporations, particularly trans-national/multinational ones can differentiate themselves by creating products or process that offer greater environmental benefits and small environmental costs than those their competitors. Recent research in adaptation of environmental management systems like ISO14,000 indicates that there is growing interest from firms from Asia in using such advantages to enhance the competitive position in the global markets. For multinational companies firmly placed on global supply chain, costs also can be reduced through risk reduction. Consumer boycotts and environmental lawsuits can be extremely costly, if better environmental management practices are not employed along the entire supply chain. For the vast number of small and medium enterprises (SME) in Asia that are part of a supply chain providing inputs to large and especially export oriented corporations, peer to peer understanding of the costs and benefits of CEM is needed. Reaching SMEs outside such global supply chains for adaptation of good CEM practices, remains a challenge but may be approached through industry associations. Further, businesses can be attracted by the pull of market as well as push of a range of external drivers as well the internal characteristics of the firms (Drucker, 1974). In recent years, these kinds of pressures have begun to impact on business in developing Asia.

However, the main concern for regulators in the developing Asia has been to either encourage or force corporations to move toward basic compliance, with traditional environmental regulations and

standards, often modelled after industrialized countries. As mentioned earlier, traditional command and control regulatory approaches where government sets standard, have mixed results in Asia. Difference in compliance rates can be accounted for by the complex interaction between external factors, such as tightening regulations, pressures from civil society and the social-cultural values of the country as well as internal factors such as organizational culture, learning style etc. The complexities of these interactions are evident in a research which indicates that in Asia, corporations are mainly responsive to 'best practices' endorsed by regulatory agencies wherein others, firms are sensitive to the influences of their trade associations (Gutowski et al, 2004). Their work also indicated that corporations in Asia beginning to move beyond simply compliance.

4. Research Needs

The conventional approach to the problem of environmental degradation in Asia has been to focus almost entirely on the role of governments. The underlying assumption is that if the correct mix of policies and resources are obtained, then better environmental outcomes will be the result. While it is undoubtedly true that public policies must continue to play a central role maintaining environmental quality, they should be proactive to strengthen corporate environmental management, to make them move beyond compliance. It is because, a globally sustainable future is not possible without active involvement of Asian corporations. This is also a good news for proactive firms that are not only willing to go beyond compliance but also actively seek new business opportunities. Even though, there has been no shortage of attention for corporate environmental issues, not much detailed information is available in developing Asia, although the importance of moving beyond compliance is felt by wide range of stakeholders in developing Asia. Good examples are scattered across countries and sectors. Much research is needed to examine the strengths and deficiencies of current practices in developing Asia.

The current KRC project titled 'Pro-active Policies and Business Strategies for Strengthening Corporate Environmental Management' is incepted with the immediate objectives of

1. To outline the current status of innovative policy tools, public private partnerships and market based instruments evolved in Asia.
2. To demonstrate, discuss and select pathways that could be implemented as strategies by companies of different sizes.
3. To summarize the advantages, outline the major challenges and
4. To motivate key decision makers to pursue the issue by establishing appropriate dialogue process and share information on good practices.

This research at its inception is envisioned to be a multi-country sectoral focused study with common but differentiated interests (IGES, 2007). Though geographically distinct the economies targeted for the research-China, India and Thailand share a common dais; rapid economic growth through aggressive industrialization and resultant environmental vows. Despite an impressive array of environmental laws and regulations, enforcements remain weak in these countries. But a rapid expansion of environmental awareness and a range of pressures point to the conclusion that old way

doing business is at risk in these countries. If companies do not accept and respond to the trends driving CEM, they will find themselves losing market share, access to capital and the good will needed to operate in a society. Fortunately, in recent years various diagnostic approaches have been experimented in China, India and Thailand with that allow firms to make performance improvements. This research project focus on such approaches as environmental information disclosure schemes and supply chain management as pathways appropriate for self-regulation. These approaches are briefly described here. Other relevant approaches and tools such as Cleaner Production and EMS, is also under active consideration for inclusion during the course of study.

4.1 Environmental Information Disclosure

Information about environmental risks is asymmetrically distributed in developing Asia. In a typical case the best knowledge about emission and pollution profiles is held by the business or regulators, not the affected community in the absence of outside pressure to do so. While disclosure strategies such as labelling have become common in natural resource settings, eg forest certification programs, they are less familiar in a emission or pollution control context. Yet the number of applications in this new arena is increasing in both industrialized and developing countries. Tailoring disclosure strategies shall be considered under the premises of (i) company- to understand the environmental cost of production and how to reduce them (iii) regulators providing them the needed information with a beyond compliance stance (iii) communities to aware of company activities, empowering them to become robust. The typical information strategy involves separate functions of establishing mechanisms for discovering environmental risks at company level, assuring the reliability of the information, publicizing or sharing the information, and acting on the information.

This approach has had major impact on industrial environmental policy in several Asian countries in recent years. Indonesia began its disclosure program in 1994, followed by Philippines Eco-watch in 1997, China’s Green Watch in 2001. Table 2. summarises the evidences on the impact of collaborative disclosure programs that strengthened conventional regulation by significantly increasing compliance.

Table 1. Corporate Environmental Performance Rating Programs in selected countries

Country	No. of factories		Share of factories (%)		Increase in compliance (%)
	Non-compliant	Complaint	Non-compliant	Complaint	
Indonesia PROPER	92	54	63	37	24
	57	89	39	61	
Philippines EcoWatch	48	4	92	8	50
	19	26	42	58	
China Green Watch	23	68	25	75	10
	14	77	15	85	

(World Bank, 2006)

Indonesia’s PROPER has chosen a single-index approach to the provision of information (Afsah et al, 1996). Under this approach environmental information disclosed by companies are

compiled and aggregated it into a single, easy-to-interpret colour rating for corporate environmental performance:

- A black rating is assigned to factories that have made no attempt to control pollution and emissions and are causing serious damage.
- A red rating is assigned to factories which have some pollution control, but which fall short of compliance with national regulatory standards.
- A blue rating is assigned to factories that are in compliance with national regulatory standards.
- A green rating is assigned to factories whose emissions control and environmental management procedures significantly moved beyond compliance.
- A gold is reserved for world-class performers, those which rank among the cleanest plants of that type anywhere in the world.

Initiatives such as carbon disclosure project (Asria, 2007), Toxic Release Inventory (TRI) are other popular examples of environmental disclosure schemes currently practiced in Asia and USA respectively. Previous studies (Konar and Cohen, 1997; Khanna et al, 1997) found stock market and environmental performance of those companies are positively related. However, the cost and benefits, drivers and barriers attached for choosing to participate or not to participate in such programs need further research. The business factors that affect successful transition from pilot experimentation to large scale implementation also need to be studied for recommending any policy instruments.

4.2 Supply Chain Environmental Management

Business of all sizes faces a variety of challenges while working to succeed in the market place and environmental stewardship. Companies seeking, at a minimum, to comply the regulations often find that pathways to compliance are not well marked. Pursuing environmental excellence can require significant amounts of information and resources that some companies, especially smaller ones – simply do not have (APO, 2002). On the other hand, with the launching of ISO 14000, global buyers are including environmental issues in their negotiation with suppliers to maintain their market share. In that sense, supply chain management are an increasingly important feature of Asian economic miracle, which is buyer driven (ADB, 2005). In simple terms, supply chain management is a management strategy to understand and manage through differentiations based on pressure or risk value (APO, 2002). However, in most Asian countries, environmental management is often treated as additional cost, particularly to SMEs. They don't have resources to improve the environmental performances. To terminate a long-term supplier relationship due to their poor environmental performance would be undesirable, and may create a disaster for trans-national companies. One option is to provide training and technical support with special credit treatment to their suppliers to improve the environmental performance. Mentoring by the buyers can help bridge this resource gap and pave the way for small and medium sized companies to become environmental leaders. Environmental mentoring also means simply the use of expertise and experience to help another business entity to improve its environmental performance. The basic goal of environmental mentoring is to provide help that enables the suppliers to achieve and maintain or go beyond compliance and establish best management practices.

Another goal of global supply chain environmental management is to facilitate a change in the organization behaviour of environmental management in developing countries and its relationship to economic performance. Many SMEs suppliers frequently view programs aimed at improving environmental performance as creating additional costs or threatening future growth (World Bank, 2004). Supply chain management; especially if it done by another business or a buyer, can help change these perceptions by providing a form of benchmarking. SME suppliers are more likely to be persuaded by large sized buyers about the value and importance of having good environmental management program (BSR, 2001). Mentoring programs or initiatives can be structured in a variety of ways. Typically, the form of mentoring programme is shaped by the type of function and activities its perform. They can be roughly categorised into three general types (i) information sharing (ii) technical assistance and (iii) environmental management assistance.

For eg, Global automobile giants like Toyota has been assisting its suppliers in the following three ways (i) estimation and eelimination of harmful substance from all first tier suppliers by providing information on how to eliminate them (ii) technical services to adopt a ISO14001 certified environmental management system by suppliers of all tiers (iii) closely communicate with supplier on the status and changes in Supplier Environmental Management Policies. Such initiatives along with in-plant improvement have reported to have significant reduction in greenhouse gas emissions. Similar form of supply chain management programs are also reported by Starbucks Coffee (UNIDO, 2002) and Asokh Leyland company of India that help the suppliers to reorient their production activities in an environment friendly way.

The benefits supply chain environmental management to the MNCs, include consumer trust, recognition by investors by demonstrating that the company's commitment to environmental excellence extends beyond its facility walls. Additionally, some well known home appliances companies like Fuji zerox, believe that supplier education and mentoring programs are important for strategic positioning in the development of more environment friendly products. In spite of various stated benefits, it is not clear from the business perspective, whether investments in these approaches yield rates of return that compare favourable with other policy remedies. What sort of public policies or soft laws and public private partnerships can motivate increased uptake of such programs also need further research.

5. Objectives of the Workshop

The application of such promising CEM approaches vary in the extend and their use. They need to well understand for wider acceptance and standardization. There may exist other promising CEM approaches that have to be further explored. Hence, IGES – KRC organized a kick-off workshop with the following three objectives.

- (i) to enhance the understanding on the actual situation and problems with CEM in the target countries
- (ii) to identify other uncovered issues and design an optimal research protocol
- (iii) To inform and elicit KRC stakeholders' opinions at an early stage of the three year research project.

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