Chapter V

Small and Medium-Sized Enterprises (SMEs) for Sustainable Development

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Summary and Recommendations

Small and Medium-Sized Enterprises (SMEs) is a crucial group of society. Including unregistered enterprises, SMEs is believed to account for more than 80% of companies in Asia, which implies diversity of the products and large supply of the workforce. At the same time, environmental impacts resulted from their brisk economic activities are remarkable and become increasingly serious, thus sustainability of SMEs is a pressing issue nowadays. Besides the socio-economic and environmental impacts, bringing SMEs to be sustainable has reasonable understanding: percolating the concept of sustainable development through their strong cohesion with local communities, avoiding economic disorder from bankruptcy of too many SMEs due to tighter regulations, securing their competitiveness in the international market; maintaining balance between economic development and conservation; expecting substantial environmental improvement as a whole. Unfortunately, however, the progress which has been made so far is still below expectation. This paper identifies problems challenging SMEs as well as measures initiated by leading international organizations and national governments, then offers recommendation on sustainable industries by SMEs, paying special attention to China, India, Indonesia, and Korea.

In order to assist SMEs, national governments and the international community have been taking steps with different means. Cleaner Production (CP) is one of the primary initiatives adopted by many countries which has proved a large cost saving. Asian and Pacific Centre for Transfer of Technology (APCTT) is the organization which offers assistance of environmentally sound technologies (ESTs), setting its primary target on SMEs. National governments provide services for environmental improvement through

their specialized agencies for SMEs' development, as well as financial assistance through national banks.

It is recognized that improving companies' environmental performance would induce and assist the development of environmental industry in which SMEs are also able to make significant contributions. Indeed, SMEs occupies quite high percentage of environmental industry from recycle material processing to air filters productions, and the environmental industry shows rapid growth, suggesting the expansion of the SMEs' business opportunities and operations.

Some obstacles, however, prevent SMEs to pursue environmental performance, resulting in the adverse impacts on the development of environmental industry. Financial constraints impose SMEs difficulties to install ESTs. Lack of information access causes failures of meeting qualifications for loans available for SMEs. In addition to these typical obstacles that SMEs confront, weakness of business/productivity management, insufficient supports from government, lack of enforcement of environmental regulations, and weak interactions between government and the private sectors are identified as the barriers in promoting environmental management for SMEs.

Although SMEs are struggling with these obstacles, they will still be a key actor in the development of environmental industry: That is because 1) SMEs has been already a primary group active in the operations of environmental industry 2) Strong demand of cleaner production under stricter international standards pushes SMEs to adopt ESTs 3) Their entrepreneurship and specialized skills are suitable to operate in the newly emerged entity 4) Increased attention to SMEs development is the robust support for SMEs' operations in environmental industry.

Despite of the fact that roles played by SMEs contain a great potential for sustainable industries, actions which have been taken for SMEs are considered as modest. The question is that in what way SMEs can be brought into sustainable industries.

Involvement of governments is indispensable for the development of environmental industry. As goods and services for the environment available in developing countries are less competitive than the ones in industrialized countries, governments of developing countries may want to concentrate their limited human and financial resources on

creating and stabilizing domestic market for environmental industries such as eco-products and services through the means to increasing domestic demand, rather than competing in the high competitive international market.

Governments would have to provide incentives to SMEs in order to stimulate the domestic market in a view of both demand and supply. As the demand side of the government involvement, regulatory instruments would be some push to increase popularity of environmental goods and services, while appropriate financial assistance is to be provided accordingly as the supply side of the government involvement. Financial assistance is required not only for the increased demand, but also to assist activities such as capacity building and training. In any case, what is important for governments is to set a priority in selecting what to do and not to do through their policy making in order to maximize effectiveness of the performance with limited resources.

Together with governments, industry associations could take crucial part for SMEs in sustainable industries. As a business oriented group, an industry association would be able to seek an optimal balance between economic interests and environmental concern of SMEs, which is quite important for the private sector in their operations. Several activities can be expected to industry associations in assisting SMEs: organizing workshops for capacity building, coordinating communication with Multi-National Corporations for know-how transfer, developing database for technical advice and information, assisting interactions with governments.

It is understood that SMEs have a great potential in contributing to sustainable industries. Yet, required conditions are not in place, and governments as well as other stakeholders are to adopt further steps to make it happen.

1. Introduction

It has been for a while since “Business and the Environment” was brought into the spotlight of public attention as one of the pressing issues of environmental protection. Industries, mostly Multi-National Corporations (MNCs) have actively adopted substantial steps to cope with environmental problems in a number of ways and continuously make progress having social responsibility in mind. Yet, it requires a significant amount of time and tremendous efforts for Small and Medium-Sized

Enterprises (SMEs) to become mature in their sustainable performance due to the financial and technical constraints as well as improper information access.

In industrialized countries like Japan, a number of assistance programs by governmental agencies from loans to consultation with experts to review companies' environmental performance are available. Such supporting mechanism, however, is quite limited in developing countries and SMEs in those countries are virtually struggling against the compliance with environmental regulations which become stricter as well as the pressure from local communities on the liability of pollution.

In this paper, significance of SMEs in socio-economy is reviewed with special attention paid to China, India, Indonesia, and Korea, followed by endeavors undertaken by international organizations and national governments to assist SMEs for the improvement of their environmental performance, which is considered to accommodate the needed conditions for the development of environmental industry. Then, SMEs' involvements in environment industry in selected countries are delineated. Coupled with the examination of the obstacles SMEs face and future prospect, the paper offers a direction for policy making in sustainable industry for SMEs.

2. SMEs in socio-economics and the environment

All over the world, SMEs vigorously play critical roles in socio-economy, and their activities are predicted to become even more remarkable than before along with the dynamics of the world economy. Small and medium, often including miciro firms provide a large number of jobs and their operations are often, if not always, closely connected to local communities. In Taipei China, 97.76% of the firms was categorized as SMEs in 1998 under the "Guidelines for Identifying Small and Medium-Sized Enterprises" issued by the Ministry of Economic Affairs, counting 7.265 million jobs which is equivalent to 69.19% (Cheng 2001). In Indonesia, 80% of the workforce is employed by 37 million SMEs, accounting for 54.59% of the national Gross Domestic Production (GDP) in 2001 (Guerin 2002). These SMEs also occupy important portion in the industrial structure and are backbone of manufacturing in supplying parts and semi-finished products to large firms, operating their business for years and years in their own communities. Because of their wide range of activities and the large share in manufacturing industries, environmental impacts that SMEs directly and indirectly cause

are considered to be enormous. In India, "there are more than 3 million registered SMEs in the country and they are found over a large geographical area. They manufacture about 7,500 products, accounting for 45% of exports. At the same time, SMEs contribute to approximately 65% of total industrial pollution," (Kittappa 2000, 21) while only 25 SMEs are certified for ISO 14001 as of July 1999 (Maithel 2002). In China, 31860,000 tons of industrial solid wastes were produced, and small scaled companies which even the government can hardly control on are responsible of 67% in 2000 (Tagome 2001).

Because of the critical roles in socio-economy and huge impacts on the environment, it is recognized that environmental performance of SMEs is one of the pressing issues that countries and the international community are to take serious steps forward. Not only because of that, but also there are even more persuasive reasons to motivate SMEs to be green.

1) Due to their business diversity, contribution to national productivity, the size of employment, and cohesion to communities, commitment to environmental improvement by SMEs will send a powerful message to the society and gear up the attention to sustainability within a country.

2) Along with the global pressure for environmental improvement, enforcement of environmental regulations at national level becomes strict. Under such circumstance, SMEs have difficulties to catch up with those tighter regulations and in the worst cases factories are closed down. Closing down of too many SMEs could lead to disordering economic activities.
3) It is expected that companies in developing countries will face, in the near future, with the strong demand of meeting international standards for environmental safety on their export products in accordance with WTO discussion. In order not to lose their market share and to weaken their competitiveness in international market, precautionary strategies are necessary.
4) A number of programs for SMEs' business development are currently carried out by nations and international development agencies. Along with the business expansion of SMEs, environmental performance has to be incorporated into business management simultaneously to maintain a balance between economic development and conservation for sustainability at an optimal point.
5) Many Multi-National Corporations (MNCs) and/or large companies already manage

their operations in environmental friendly ways from employees' training to environmental accounting, while it is said that more than 50% of the industrial pollution in the region is the responsibility of SMEs (UNEP 2000). Thus, the society may not be able to expect dramatic improvement from MNCs any further, instead improvement of SMEs' performance for environment may be more promising, bringing a leap on environmental protection as a whole.

Improving environmental performance of companies guarantees predominant influence over the development of environmental industries. It prepares the foundation/infrastructure for environmental industries to grow such as an increase of environmental consciousness among individuals, thus creating substantive support from governments and consumers towards development of environmental industries. Furthermore, technologies and information transferred from other countries in the purpose of improving environmental performance can be well adopted for their own initiatives in the development of environmental industries in developing countries. Cleaner Production explained below can be a showcase in this context

3. Initiatives and measures

It is rarely self-commitment and spontaneous actions, but most of the actions undertaken for SMEs to improve their environmental performance come into practice with the assistance through international organizations and bilateral donors as well as government assistance. In this section, some selected actions are discussed.

1) Cleaner Production

The Term of cleaner production (CP) becomes increasing common as environmental impacts of production process are broadly realized, and the concept of CP is regarded as one of substantial approaches to cope with the issues existing between manufacturing industries and their environmental improvement. It was the establishment of the United Nations Environmental Programme (UNEP) Cleaner Production Program in 1989 that the term of cleaner production has started being popular. Currently, different organizations use different terms, such as greener productivity by Asian Productivity Organization (APO) and Eco-efficiency by World Business Council on Sustainable Development, but the concept they conceive is essentially the same that is :to minimize

energy and resource use (inputs) and to reduce waste and discharges (outputs) in the production process.

Regardless the size of operation, primary interest of the private sector is to maximize the net profits. Thus, majority of them have some hesitation to take the first or further steps for environmental performance because of the concerns of "additional or unnecessary" costs for them to burden, and that concern is implicitly strong especially among SMEs in developing countries. It is often too costly for SMEs to invest for installation of energy efficient and/or less-polluting facilities, although they might be aware of the advantages to do so in a long run. In its "Pollution Prevention and Abatement Handbook," however, World Bank Group argues the point. "As a rough guide, 20-30% reductions in pollution can often be achieved with no capital investment required, and a further 20% or more reduction can be obtained with investments that have a payback time of only months." (World Bank Group 1998) A case from India below demonstrates economical attraction of CP.

In 1993, a CP demonstration project targeting SMEs was initiated by United Nations Industrial Development Organization (UNIDO), in cooperation with the Indian National Productivity Council and other industry associations. The DESIRE (DEmonstration in Small Industries for Reducing wastE) project focused on three sectors: agro-based pulp and paper, textile dying and printing, and pesticides formulation. Results for one of the pulp and paper plants prove the types of savings possible. In a plant producing 36 tons of paper per day, a combination of process and equipment modifications and some new technology was identified that improved the product and the operating conditions for a capital investment of US$25,000, with a payback period of less than three months. (World Bank Group 1998)

Compared to the investments for end-of-pipe measures, CP shows greater potential of saving by reducing energy and material use as well as costs of pollutants and wastes in mid- and long perspectives. In the case of Solasia Energy Development Co., Ltd. (ten employees and annual revenue of approximately NT$34 million) in Taipei, China, APO demonstration project of the Green Productivity (GP) Program successfully saved nickel material, and reduced treatment cost and sludge volume by reducing the amount of Ni discharge. Measures used by the GP program are mainly installation of facilities, such as multi-stage countercurrent rinse system and an advanced ion exchange system. The

action of the reduction of Ni discharge itself resulted in the saving of NT$238,200/year with the investment cost NT$2,000/year, being added NT$2,000,000/year by recycling of degreasing liquor, and NT$69,300/year by recycling of rinsing water (Cheng 2001). In other words, total NT$2,307,500/year was saved with the investment costs only NT$611,000 by implementing the GP program.

While economic benefits become a strong incentive for companies to adopt CP, a government policy may be even more effective driving forces to shift obsolete polluting technologies to advanced environmentally sound technologies, especially in countries where advantages of CP are hardly reached to a right place. In December 1996, the Indian Supreme Court made the decree of banning the use of coal and switching over to natural gas to industrial units located in Taj Trapezium Zone (TTZ), an area of 10,400 sq. km in where the famous Taji Mahal is located. Within the TTZ, small scale glass industries are operating in the Firozabad glass cluster, where 70% of the total glass production is made. With financial assistance from Swiss Agency for Development and Cooperation (SDC), small scale glass industries in the Firozabad were able to install gas-fired furnaces replacing conventional goal-fired furnaces. As results, there is a clear improvement of air quality by reducing emissions of particles and carbon monoxide in neighboring areas and of living conditions in the cluster, coupled with energy saving. This Supreme Court ruling was made possible because of public interest litigation to protect the World Heritage site from pollution. Thus, this case demonstrates that the transition to cleaner technologies was made not solely from a government policy but public concerns against pollution acted as the push behind the policy.

Another example of CP that was taken in response to a government policy is Industrial Efficiency and Pollution Control (IEPE) in Indonesia. Ministry of Environment of Indonesia, together with Ministry of Finance, Government of Germany as well as banks, has been carrying out IEPC project since 1997, and Revolving Fund System for Environmental Management in Indonesia under the IEPC is to provide environmental investment loans to SMEs. The grant of DM 15.6 million from the Government of Germany is used for:

(1) Investments in production facilities for pollution reduction and/or natural resource saving
(2) Investments in machinery and equipment for recycle, reuse, and recover waste

materials

(3) Investments in waste treatment for neutralization of industrial wasts and pollution

Almost 60% of the loan has been allocated for category (1), 22% for (2), and 17% for (3) respectively. So far, twenty two SMEs applied for the loan in recycling and reusing wastes (ESCAP 2002).

In order to bring the concept of CP down to the implementation by enterprises in developing countries, UNIDO started been setting up National Cleaner Production Centres (NCPCs) since 1994, and UNEP provides strategic advice from its expert points of views. The services NCPCs offer are: 1) Technical Assistance and In-plant Assessments, 2) Training, 3) CP Technology and Investment promotion, 4) Information dissemination, 5) CP Policy advice, and UNIDO identifies SMEs as the primary focus of the NCPCs' services. Until today, twenty two NCPCs have been established in countries including China, India, and Korea. Furthermore 24 Cleaner Production Centres (CPCs) have been established in China and 4 CPCs in India under their NCPCs to deliver CP programs applicable to local conditions. In collaboration with the NCPCs, UNIDO carried out demonstration projects of CP in China and India, the targeted sectors of which were SMEs in paper and pulp, metal finishing, leather manufacturing, and textiles industries.

Though the concept itself is regarded as a win-win approach: environmental friendly conditions enable to be created along economic benefits through less spending on raw materials and energy as well as waste treatments, CP leaves yet unsolved issues in its implementation. Due to the high costs on initial investment and weak funding support mechanisms for SMEs, CP investments are challenged by being applied in broader use. In economic point of views, CP could be even less attractive in countries where: Lax environmental regulations are applied, Enforcement of regulations is hardly ensured, Natural resources are under-priced or even free, Consumers are less interested in products that are produced in a more environmentally responsible manner (UNEP 2000). These facors suggest the importance of awareness raising accompanied with CP implementation.

There are a great number of cases that SMEs are simply not aware of CP program itself and/or available financial assistance. In addition, as they are tied up with their day-to-day

operation, owners and/or managers of SMEs hardly envisage their management plan in mid- and long run, resulting in the indifference to CP programs which could yield long term benefits. Dody Bastaman, senior official at the Environment Agency in Tangerang Municipality in Indonesia, introduced in the Jakarta Post that only 10 of 720 companies in his area have participated in CP program. Deputy Assistant for Standardization and Technology at the Ministry of Environment of Indonesia, Sabar Ginting, mentioned in this regard that "many firms don't believe that clean production can minimize operating costs" (Jakarta Post 2002). Their words imply the needs of education programs for SMEs to be acquired relevant information and boost their understanding about CP.

2) Asian and Pacific Centre for Transfer of Technology (APCTT)

United Nations Asian and Pacific Centre for Transfer of Technology (APCTT) of the Economic and Social Commission for Asia and The Pacific located in New Delhi, India provides assistance of environmentally sound technologies (ESTs) ranging from waste management to energy efficiency in the region, setting the primary target group on SMEs. More than US$60 million in total value was facilitated by APCTT for technology transfer contracts among SMEs in 1996 (APCTT 2002). The activities include organizing training programs, networking, and match-making between buyers and sellers of technologies. Through these endeavors, APCTT successfully facilitates more than 250 technology transfer negotiations per month.

The services APCTT offers have been carried out through its strong partnership with a number of industrial associations, consultants, as well as governmental agencies. With their technical inputs, APCTT promotes ESTs transfer by dissemination of information, identification of appropriate technology, and adoption of technology to match local conditions. The partners include China Science and Technology Exchange Centre, Consultancy Development Centre, Korea Institute of Industry and Technology Information, and Rajasthan State Industrial Development & Investment Corporation Ltd., (India).

Another significance of APCTT is International Network for Transfer of Environmentally Sound Technologies (INTET). INTET AISA was established in 1994 in India with the intention of APCTT to develop network among SMEs and intermediaries (business consultants, technology brokers, information and technology development

organizations) and to provide appropriate information for ESTs transfer. The members spread not only in Asia, but also European countries such as Netherlands, and United Kingdom. With the growth of the global membership and its high demand, APCTT embarked extending the national network, setting up INTET Pakistan and Russia. Furthermore, it is currently in process to develop web-based services, so that necessary information can be reached to more SMEs with less cost.

3) Institutional arrangement of national government

In recognition of SMEs' substantial performance in national economy, specialized agencies are arranged within the governments to assist SMEs development. In India, Small Industries Development Organization (SIDO) was set up to assist Ministry of Small Scale Industries and Agro and Rural Industries of India in implementation of policies and programs for the development of small scale sectors, as well as providing technology support services. Energy conservation is one of the areas covered by Technology Management Division which was established in January 1997 within the SIDO. Being concerned with high energy consumption in certain sectors, the division of SIDO takes a lead in increasing awareness about the advantages of new techniques of energy conservation. From 1998 through 1999, Rs.20 lakhs (Rs. 2million) has been allocated for awareness programs, preparation of video etc. (Ministry of SSI & ARI2002).

4) Financial assistance

In general, financial institutes have a hesitation to accommodate loans to SMEs due to the risks of payback. Even if financial institutes offer loans to SMEs, the interest rates imposed to them are less favorable compared to the ones for larger companies. Because of that, SMEs' access to financial sources is explicitly below the demand, though some financial institutions indeed provide assistance for SMEs' environmental performance.

Small Industries Development Bank of India (SIDBI) -India was established in April 1990 under the Act of Indian Parliament, being a wholly-owned subsidiary of Industrial Development Bank of India. Under its Promotional and Development activities, SIDBI launched the environment management initiative, the objectives of which are to increase awareness of environmental issues and regulations among Small Scale Industries (SSIs)

and to assist them in finding solutions toward pollution prevention through demonstration projects. The bank supports the awareness programs by covering participations fees, and subsidies of consultation fees and the cost of equipments for demonstration projects.

National Environment Engineering Research Institute (NEERI), Environmental Protection Training and Research Institute, Centre for Environmental Educations are engaged to execute the bank's awareness programs. For instance, a satellite interactive network for the message of "Green Profits" stationed in New Delhi was carried out with over 200 participants from SSI units in 13 cities all over the country. The bank also supports demonstration projects for cupola based foundries, induction furnaces, electroplating units, dyeing unites, and cost effective technology has been demonstrated with the payback period of less than one month. The program is extended to more industry sub-sectors and more diverse geographical areas. (SIDBI 2002)

4. SMEs in Environmental Industry

While improvement of their environmental performance is a critical assignment for sustainable economic growth in society, development of environmental industry would offer comprehensive opportunities to SMEs in their business and environmental improvements in mid- and long run.

In a study of environmental industry in China reported by the State Environmental Protection Agency in 1993, the number of the corporations categorized in environmental industry accounted for 8,651 with 1.882 million employees, and their productivity was equivalent to 31.148 trillion Yuan and the benefit was calculated 4.091 trillion Yuan per year. Among the total number of corporations in environmental industry in China, companies which produced eco-products account for 3,158 and the production value of each company was 3.29 million Yuan on average per year. Environmental industry is not an exception for SMEs to play an important role in China. Small scale corporations occupy 82% of the total environmental industry. In Jiangsuis Province, 87.8% of the total number of corporations is SMEs: 92.6% for Zhejiang Province; 89.6% for Shanghai respectively (GISPRI 1998).

The growth of Chinese environmental industry is dynamic. The number of companies in environmental industry jumped to 18,144 in 2000, and the productivity is from 31.2

trillion Yuan in 1994 to 168.99 trillion Yuan in 2000 (Zhang and Yu 2002). Coupled with government policies of foreign investment and tax exemption on environmental industry, the trend will continue, and environmental industry, virtually SMEs is and will be growing further.

Like other countries majority of companies in Korea is categorized as SMEs, accounting for 99% of the total number. The high percentage of SMEs suggests that SMEs is a dominant in environmental industry. Indeed, recycled material processing is monopolized by 180 SMEs as of 1995 (JSBRI 1998). Besides that, there are the SMEs the operations of which contribute to environmental improvement in Korea. For example, Miracle Co., Ltd., with 12 employees and its annual sales revenue of US$ 300,000 produces air filters for automobiles and has acquired Environmental Label (KELA) in 2001 (Miracle 2003). MEITEC (Marine Environmental & Industrial Technology CO., Ltd.), which holds 19 employees and the capital of 150,000,000 Won, conducts scientific investigations on impacts of oil pollution and a project of aquaculture purification management (MEITEC 2003).

The substantial involvement of SMEs in environmental industry is an encouraging factor for the development of the industry, being considered its socio-economic impacts as mentioned earlier. Nevertheless, the challenges with which SMEs face such as technology adaptation and their vulnerabilities of financial situation leave the positive expectation uncertainty.

5. Challenges against SMEs

Generally speaking, SMEs fall in the constraints of lack of financial resources, poor information access, and less skilled personnel. A survey conducted by Asia Foundation shows that only 17 % of SMEs had ever received a bank loan in Indonesia due to lack of information access to the loan and failure to meet qualification for the loan (Guerin 2002). Obsolete technologies that SMEs typically use are usually more polluting, and lack of awareness about adverse environmental impacts caused by their day to day operations results in underestimation of the importance of environmental measures in the view of social responsibility. These all constraints induce problems for environmental improvement by SMEs. Furthermore, the fact that companies fail to adopt appropriate measures suggests them some risks of paying for fines and closing their factories down

for the worst case.

A study conducted by Japan International Cooperation Agency (JICA) identified four obstacles in promoting the activities of environmental management including Cleaner Production (CP), and the above mentioned three constraints are closely related to the obstacles.

(1) Weakness of business/productivity management. Environmental management can be successfully incorporated in well-established business management. Thus, weak business management does not direct an appropriate framework for environmental performance. For example, when the owner/manager of a company does not grasp the clear vision on the operation costs and profits of the company, economic benefits created by CP in mid- to long run are not correctly calculated, resulting in the fact that CP cannot be fairly appraised.

(2) Insufficient supports from government. Policies and measures are hardly favorable of companies nor do respond it to needs of companies. As the access to loans and/or financial support plan are not in place, companies especially SMEs are not able to make an investment to CP and other environmental measures.

(3) Lack of enforcement of environmental regulations. When the enforcement of regulations is not ensured, companies especially in developing countries which receive less consumer pressures hardly have incentives to improve their environmental performance unless they have a strong self-commitment to environmental protection. In this circumstance, environmental management and CP are not attractive for them, but rather considered burdensome.

(4) Weak interactions between government and the private sectors. As is widely recognized, sustainability of the society can be realized only when governments, the private sectors, and citizens are fully involved, and cope with each other. The success of such a collective actions largely depends on understanding among stakeholders through communication. Then, lack of the interactions is critical in pursuing sustainability.

6. Future Prospect

Despite of the difficulties they have to cope with, it is expected that SMEs would continue to be a key in the development of environmental industry. Followings are some factors to support this prospect.

First, SMEs have already occupied a large portion of environmental industries in China and Korea, and that state would be so unless industrial structure in these countries is changed drastically. Indeed, Chinese environmental industry presently shows a rapid growth as was discussed earlier.

Second, without exception, SMEs in the four countries will be exposed to strong requirement of stricter international standards in their production process due to increased access to the global market. Thus, they will be obliged, no matter they want or not want, to apply environmental sound technology to stay in business.

Third, compared to other industries, in which certain companies historically have established their jurisdiction of business, environmental industry is a newly emerged business entity, thus it contains more oportunities for SMEs to penetrate into the market. With their entrepreneurships and specialized skills as well as the simple decision making – usually what an owner says will be the corporate decision, SMEs is more flexible than larger companies to offer goods and services to the market demand of environmental industry in a timely manner.

Fourth, a number of nations and organizations have conceived the significance of supporting SMEs business operations, and the topic has been discussed at the national, regional, and international levels. Recent example of the Asia Pacific Economic Cooperation (APEC) Small and Medium Enterprise Ministerial Meeting I August 2003 draw special attention on financial access and capacity building, as well as addressing the obstacles of export for SMEs. Such kind of conference by policy makers would certainly make things work faster, and the development of environmental industry undertaken by SMEs should be benefited from these initiatives.

7. Recommendations

As was seen, SMEs is a critical group of actors in socio-economy and sustainability. This recognition of their significance is reflected in the initiatives by international organizations and national governments. Nevertheless, the obstacles that SMEs face are yet unsolved, and further actions are called for in order the above mentioned prospects to be ensure.

1) Develop appropriate government policies

Exchange of goods and services across the borders is expected to become more active, following the World Trade Organization's scheme of trade liberalization. Like other products, it is obvious that industrialized countries are far more advanced in the areas of environmental industries and environmental management than developing countries. Thus, the level of technology as well as quality of eco-products and services offered in developing countries are not yet strong enough to compete with the ones by industrialized countries at the competitive international market. In recognition of the comparative advantage, policy makers of developing countries may not want to use their moderate resources both human and financial to aggressively penetrate into the international market, but rather focus on facilitating domestic market to increase the demand of eco products and services.

Regulatory instrument

Tighter regulations and environmental standards would be one of the instruments for governments to stimulate the domestic market of environmental goods and services. For SMEs which run their business on day to day bases, voluntary actions for social responsibility are not in their serious consideration unless they could visualize explicit economic benefits by doing so. The fact implies some kind of statute for environmental improvement would induce them to invest in pollution control and waste management. Tightness/degree of regulations, however, has to be carefully set. Otherwise, strict regulations would be simply ignored under weak enforcement or some SMEs would be out of business due to their incapability to catch up with the renewed regulations, which leads to adverse impacts on the country's economy mentioned earlier.

Financial assistance

In ways to guide the society to be sustainable, governments are to not only impose regulations but also to offer supports to meet the regulations. Installation of a pollution control machinery is always too costly for vulnerable SMEs. Thus, funding arrangement accompanied with the introduced regulations are necessary.

Strong financial mechanism is required not only to meet regulations, but also to assist SMEs' overall positive activities in the area from environmental management to capacity building. Although SMEs have already contributed to major parts of environmental industry in many countries, their roles would become even more active in the near future with their entrepreneur spirit, specialized technologies as well as flexible mobility. Then, problems they currently face should be taken care without delay, especially the financial constraint. Generally speaking, financial mechanism is quite weak in developing countries, and funding for SMEs is even poorer. As is widely recognized, governments need to develop appropriate financial assistance for SMEs.

As the result of rapid industrialization, Japan suffered from heavy industrial pollution, and measures for the mitigation were urgently needed. The governments responded to the issue by introducing public funding systems, such as Japan Finance Corporation for Small Business and Japan Environment Corporation, for pollution abatement and many of them were to assist financially vulnerable SMEs. At that time, it was perceived that the investment in pollution control machineries did not bring the increase of productivity, thus private financial institutions were reluctant to invest in pollution abatement. Consequently, companies had to depend on the public financial institutions. Indeed, reliance on public funding for pollution abatement had been much higher than the one for other use. Furthermore, the introduction of public funding systems induced private funding for pollution abatement machineries (GISPRI 1999).

In any case, for both regulations and financial assistance it should be secured that governments set a priority in their policy making. Obviously, with limited human and financial resources governments are not able to handle all issues the society faces, and that requires policy makers to choose what to do and what not to do. For instance, India may put a priority on waste management at tanneries over paper recycling. Based on the agenda setting, regulations should be targeting to waste quality improvement along with

appropriate financial assistance for that target. Prioritizations of issues is the fundamental task in policy planning for effective resource use.

It is also important for each country to carefully examine and make priorities on what to take and not to take from outside of their countries. It would be indispensable for developing countries to adopt the advanced technology and knowledge from industrialized countries like Japan, the United States and the European Union countries in the development of environmental industry and enhancement of environmental management in order to satisfy the demands of the domestic market of environmental industry. Again, implementation of a policy requires huge resources from finance to human power. With that limited resources, a government is unable to afford anything which looks good. Instead, policy makers have to examine what is most needed for their countries, knowing the maturity of environmental industry and management of their own countries. For instance, China may need consulting service for air quality improvement, but may less need eco-products because of yet weak consumer demand, while consumers in Korea may be ready to buy eco-products which is relatively expensive compared with regular products and they are aware of the importance of consumer demand for sustainability.

2) Encourage the involvement of other stakeholders

Governments are not the only one actor for environmental performance and development of environmental industry, but other stakeholders are to take part of the policy implementation. Because of the unique roles and the position, industry associations can be catalysis in development of sustainable industries for SMEs. As is recognized, environmental measures should be accompanied with economic benefits to win the interest of companies. Setting the objectives in enhancing business development through technical training, information sharing, and consultancy, the involvement of associations could be convincing and appealing in promoting environmental performance to business sectors, even if companies might still feel skeptical towards environmental improvement. In other words, industrial associations are in the ideal position to motivate companies to integrate environmental concerns into their business management, transmitting a message that the environment is not costs, rather it is benefits for business operations as well as foreseen business opportunities. Possible functions that industry associations can take are as follows:

Organizing a workshop/meeting for capacity building

Making a maximum use of their network, associations will be able to support a workshop/seminar in the purpose of training for SMEs. For instance, Chamber of Commerce and Industry in Vietnam provided an occasion for managers of SMEs to learn about the application of CP in wastewater treatment, to be introduced about financial assistance of Japan Bank for International Cooperation (JBIC), and to interact with local government officers by hosting a seminar named "Diminishing the environment pollution in industries of Danang City and environment restoring policies" in close collaboration with industry associations. The participants were invited through the network of the associations in relevant sector. Participated by approximately 60 persons, the seminar was very informative and active discussions were taken place. The participants expressed in the feedback that the seminar was useful and should be continued.

Coordinating in establishment of the relationship with Multi-National Corporations (MNCs)

Large companies, especially MNCs, are sensitive to the issues of social responsibility and consumer pressure, thus their commitment to environmental performance has been embodied in comprehensive like technological development, recycling programs, environmental education for employees, environmental accounting, and so forth. Although their environmental performance has achieved at a sophisticated level, and SMEs may not be able to adopt the same environmental performance as MNCs do because of the size of financial resources and skilled personnel. Yet, there should be the know-how that can be applicable and useful to SMEs, and associations can play a role of a mediator in bridging SMEs and MNCs. Confederation of Indian Industry (CII), a large non-governmental business association, develops "Small, Medium and Large Industry Partnership, in intention of the promotion of closer relationship and mentoring services for SMEs. At present, the partnership may only focus on business development, but could be extended on environmental management. Through the new partnership, new business opportunities can be also expected.

Developing database and provide technical advice and information

SMEs in developing countries chronically fall into the difficulties in collecting necessary information and/or often they do not even know the availability of information. In addition, the information is sometimes available only in foreign language or through

Internet. Under such circumstances, industry associations can develop database and provide appropriate information as necessary to SMEs. In that way, SMEs do not need to spend extra time on asking around for information. At the same time, Internet access and translation service can be also considered as further assistance. For the example of technical advice, CII offers professional services about environmental management and energy conservation to SMEs. The services in environmental management include advice on environmental policy, in-company and inter-company training programs. Because of the success, these services are extended to other regional and state offices. Thus, this kind of attempt should be replicated in other areas and countries.

Promoting interactions between governments and SMEs

Sustainable development can be attained with the optimal balance of three pillars, namely social, economic, and environmental aspects in society, suggesting cooperation among all stakeholders is mandate. In reality, however, there are hardly occasions for governments and SMEs to communicate each other, thus governments may not know the needs of SMEs while SMEs hardly have a way to be informed about new regulations and assistance announced by governments. In this regards, associations can coordinate the dialogue among stakeholders and facilitate interactions between governments and SMEs.

8. Conclusion

SMEs is a group of stakeholders who literally support socio-economic activities of countries and are responsible of adverse environmental impacts in large parts. Moreover, they are the vehicle of eco business in many countries. These features suggest promising leverage in achieving sustainability: That is to incorporate SMEs' commitment to sustainability into their business strategies, enhancing their environmental management as well as involvement in environmental industry. Despite of this understanding, all stakeholders including national governments, the private sectors, as well as the international community have not yet done enough, and the development of the policies which respond to the needs has been delayed.

Technology solution has received a special attention, and demonstration programs are carried out in collaboration with foreign and international donors. However, issues of finance and lack of effective policies, coupled with poor access to appropriate information, leave insecurity toward the expected outcomes. What is needed for sure is to

bringe all stakeholders from governments and financial institutes to industrial associations and companies, regardless the size of operation, into the development of sustainable industries played by SMEs and to develop appropriate policies with clear targets in order not to have the promising leverage fading away.

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Appendix: Comparison of Definitions of SMEs in the Selected Countries

Country	Definition	
China[1]	1) Manufacturing, construction, mining	paid-in capital of less than NT$60 million or fewer than 200 regular employees
	2) Forestry, agriculture, fishing, electrical, gas and fuel oil, commerce, transportation, warehouse, courier, finance, insurance, industrial and commercial service	sales of less than NT$80 million for the previous year or fewer than 50 regular employees.
India[2]	1) Small Scale Industrial Undertakings	An industrial undertaking in which the investment in fixed assets in plant and machinery whether held on ownership terms on lease or on hire purchase does not exceed Rs 10 million
	2) Tiny Enterprises	Investment limit in plant and machinery in respect of tiny enterprises is Rs 2.5 million irrespective of location of the unit.
	3) Small Scale Service & Business (Industry related) Enterprises (SSSBEs)	SSSBEs industry related service/ business enterprises with investment upto Rs 500,000 in fixed assets, excluding land and building, but This limit has been raised to Rs.1 million
Indonesia[3]	According to Undang-Undang (Regulation) No 9 Tabun (year) 1995, small businesses have a maximum net worth (excluding land and building) Rupiahs 200 million or maximum sales of Rupiahs 1 billion, are owned by Indonesian citizens and are independent i.e. not a subsidiary of , or owned by, or affiliated directly or indirectly with, medium size or big enterprises	

[1] "Guidelines for Identifying Small and Medium-Sized Enterprises" by the Ministry of Economic Affairs in 1995

[2] Small Industry Development Organization Online available at http://www.smallindustryindia.com/ssiindia/definition.htm

[3] http://www.tradenetsl.lk/sme/definition.htm

Korea[4]	SMEs is generally defined as a company which employs fewer than 300 persons or whose paid-in-capital amounts to below 8 billion won	
	1) Manufacturing	The number of employees or paid-in-capital - Fewer than 300 employees or less than US$ 6.7 million in paid in capital
	2) Service	Standards based on the number of employee or sales - fewer than 300 employees or less than US$ 25 million in sales-information processing, etc.(9 categories) - fewer than 200 employees or less than US$ 16 million in sales-communication, etc(43 categories) - fewer than 100 employees or less than US$ 8 million in sales-communication sales, etc.(84 categories) - fewer than 50 employees or less than US$ 4 million in sales - wholesale, etc.(14 categories) - fewer than 30 employees or less than US$ 1.6 million in sales - retail, etc.(224 categories)

[4] The Framework Act on Small and Medium Enterprises