Part Three: Role of External Factors in Environmental Industry Development

Chapter VI

The Major Contributions of Japan's ODA and Japanese Multinational Corporations to Environmental Industry Development

Yoshiaki Nakaune
Visiting Research Fellow
Institute for Global Environmental Strategies

Summary and Recommendations

1) The contribution of Japan's ODA
Japan started economic cooperation for developing countries by joining the Colombo Plan in 1954. In 1989, Japan became the world's top donor among the 21 DAC member countries. Japan's cooperation in the environmental field are categorized following 5 sectors; 1) residential infrastructure, 2) forest preservation, 3) antipollution measures, 4) disaster prevention, and 5) other sectors (nature conservation, environmental administration, seawater contamination, global warming).

The Japanese government adopted Japan's Official Development Assistance Charter (ODA Charter) as basic philosophies of Japan's ODA in 1992. In the ODA Charter, the environmental consideration is considered as the most important matters. In 1997, then-prime minister Hashimoto announced the "Initiatives for Sustainable Development Toward the 21st Century" (ISD) as the Japanese basic philosophy on environmental cooperation. Philosophy of ISD is that Japan's environmental cooperation will be extended in accordance with the following ideas; i) global human security, ii) ownership, iii) sustainable development, and following five areas are listed as the action program; i) air pollution (acid rain), water pollution, and waste disposal, ii) global warming, iii) nature conservation, iv) water issues, v) development of public and government awareness. At the 2002 Johannesburg summit, five years latter of announcement of ISD, Japan is issuing its Environmental Conservation Initiative for Sustainable Development (EcoISD), replacing the current ISD.

Nowadays, environmental problems are recognized globally and diversified from natural

degradation to global environmental problems. That is, adding to the environmental problems of the degradation of renewable natural resources, deteriorating urban environments by rapid industrialization and health problems by pollution, global environmental problems such as global warming, desertification, and the reduction in biodiversity are recognized as significant problems.

In order to provide cooperation for tackling with these problems, it is important for ODA to introduce optimum policies and technologies for environment issues to recipient countries. Japan has obtained plenty of know-how through overcoming industrial pollution problems. These Japanese experiences will contribute antipollution measures in industrialization of developing countries. Japan will transfer Japanese appropriate technology and know-how to assist the environment conservation of developing countries under the ISD plan.

It is important to enact proper environmental laws and regulations and make circumstances to enforce these laws and regulations in developing countries. This will encourage by development assistance for environmental policy support for government in developing countries. Many developing countries do not have the proper technologies for environmental monitoring to check the present environmental problems. It is essential to strengthen technologies of scientific analysis for inspecting environmental problems.

Japanese assistance by the project-type technical cooperation will provide the measures of these purposes. The cooperation will transfer the technologies and skills necessary for environmental monitoring to developing countries. And also, the cooperation will support to develop capability of policy-making for environment, promoting environmental standards, strengthening environmental organization. This will provide fundamentals to develop the environmental industry in developing countries. Japan has provided the project-type technical cooperation to six countries; Thailand, Indonesia, China, Chile, Mexico, and Egypt.

In the case of China, the Japan-China Friendship Environmental Protection Center, as a project-type technical cooperation, opened in 1996, and had preferable effects to China’s environmental issues. And also under the agreement on "Japan-China Environmental Cooperation toward the 21st Century", the establishment of Environmental Information Network, and the creation of environmental model cities are implementing. The Environmental Information Network plans to make a nationwide environmental information network with the Japan-China Friendship Environmental Conservation Center as the core.

The China-Japan-Korea Tripartite Environment Ministers Meeting (TEMM) has learned annually since 1999. Cooperation in environmental industry was selected one priority areas in environmental cooperation. At the 2nd Tripartite Roundtable Meeting in Awaji, Japan in 2002, Chairperson points out in his summarization of the meeting as follows; 1) It is recognized that government policies have long served as effective incentives for the development of environmental industry. 2) Environmental industry will be one of the most important industries in the future in China, Korea and Japan.

2) The contribution of Japanese MNC

Many companies pay attention to the environmental consideration in their corporate activities including the production process in domestic and abroad. Production activities of multinational companies in developing countries have a possibility to improve environmental consciousness of the people and society of developing countries.

Japan has experienced the industrial pollution problems in 1960s and 1970s and some companies found this for business chance to utilize the technology and know-how obtained through overcoming industrial pollution. In the forecast of market size and employment in Japanese environmental industry, the market size in 2020 will increase to 2 times of 2000 and the employment will increase to 1.6 times of 2000. The export of environmental equipment is not a big scale yet.

Foreign direct investment (FDI) of Japanese companies increased greatly in 1970s. In the operation of Japanese manufacturing companies in foreign countries, especially in developing countries, it often discusses about insufficiency of the environmental consideration in production, and inability of implementation of regulation and rules by local government.

Nowadays, many Japanese companies take into consideration for environment issues in their foreign investment as a same in domestic activities. Japanese companies tried to develop their environmental mind in their foreign manufacturing activities by the leadership of Keidanren in 90s. Although the defects of environmental laws and regulations are indicated, Japanese companies made positively environmental measures and environmental assessments in the process of FDI, and also many Japanese companies had their own environmental management policy.

Japanese companies are trying to provide environmental technical support and environmental information to the joint venture companies in developing countries. Technology transfers of

advanced environmental technology form multinational enterprises are expected in developing countries. Multinational companies, which have much capital sources and technological capabilities, should take leadership to cope with environmental problems.

There still remain problems in the field of environmental infrastructure in developing countries. For instance, many companies have worries the treatment of industrial waste. The development of environmental infrastructure is anticipated the support of ODA.

3) Recommendations for Future Development of The Environmental Industry

Japan's ODA has been providing the assistance for developing countries in the area of 1) equipments to reduce environmental burdens, 2) services for environment protection, and 3) assistance for building social environmental infrastructure. In the technical cooperation for developing countries, Japan is cooperating to reinforce environmental institution building of the government in the form of dispatching Japanese experts, accepting trainees from developing countries and providing of environmental equipments.

The effective regulation for environment and its proper implementation is the priming water of development of environmental industry. At this sense, ODA contribute the development environmental industry in-direct way. The development of government attitude for environment will educate the company's environmental mind. ODA will contribute construction for good infrastructure for environment and environmental mind of the government in developing countries.

Corporate activities will contribute more directly to reduce the environmental problems. It will be a role of multinational companies to lead their related local companies to the operation for environment friendly in developing countries. Many Japanese companies are operating with environmental measures in Asian countries. These corporate attitudes will help to develop environmental minds in local companies. The corporate behaviors also improve subcontractors' attitude for environment. It seems that consciousness for the environment leads to set up the environmental industry market in developing countries.

The environmental consideration of Japanese multinational companies in developing countries will raise the environmental consciousness of local companies. Moreover, local companies will be able to develop their technology for the environment in their subcontract work of Japanese multinational companies. Japan's ODA offers the basic technology for the environment protection and raises the consciousness for environment in developing countries.

And governments of developing countries will get the hands to secure the implementation of environmental restriction. And engineering companies will offer practical technology to protect environment issues. The combination of three actors will lead the development of environmental industry.

Section I:
Japan's ODA and its Effects on Environmental Industry Development in Selected Asian Development Countries

1. Japan's Official Development Assistance (ODA) in Environment

1) Outline of Japan's Environmental Cooperation: Bilateral and Multilateral

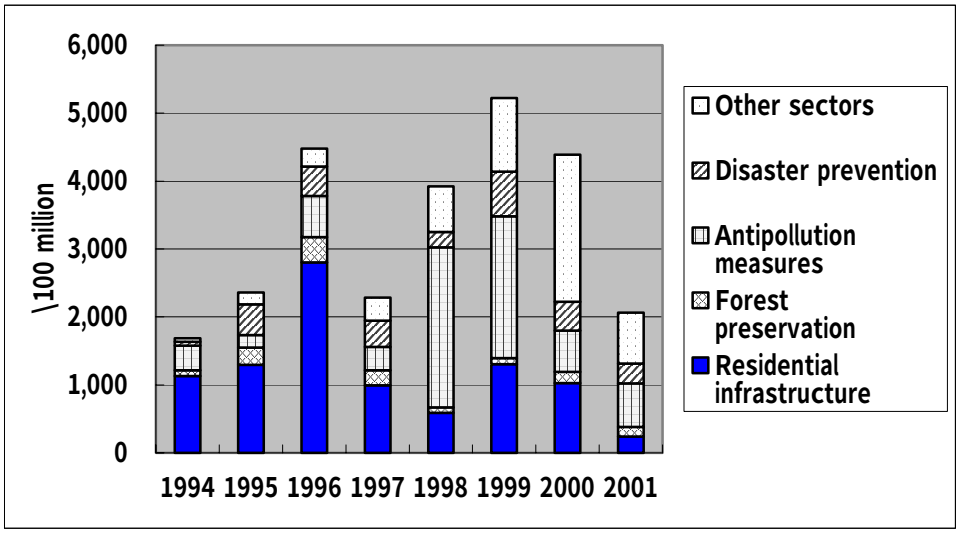
Japan started government-to-government technical cooperation for developing countries by joining the Colombo Plan in 1954. And also, Japan extended yen loan to India at the first time of this type of cooperation in 1958. In 1989, 35 years after when Japan started official development assistance for the developing countries, Japan became the world's top donor among the 21 DAC member countries. Then Japan is contributing to the development of developing countries in many fields until today.

Japan began environmental cooperation in the early 90s. Then Japan's ODA puts priority in the field of environment. Japan's cooperation in the environmental field are categorized following 5 sectors; 1) residential infrastructure, 2) forest preservation, 3) antipollution measures, 4) disaster prevention, and 5) other sectors (nature conservation, environmental administration, seawater contamination, global warming).

The theme of this project is to study the situation and possibility of development of environmental industry in the Asian developing countries, especially China, India, Indonesia and Korea. Japan's ODA has the possibility to contribute development of environmental industry in Asian in the following manner. The first is cooperation for environmental institution building of government. These are cooperation for formulation of environmental policy and regulation, and technical cooperation to raise the measurement ability of pollution problems. The second is direct cooperation for pollution prevention by providing pollution control equipments by grant aid and yen loan. These cooperation will also assist the technology transfer of manufacturing technology for antipollution equipment and operating technology for antipollution equipment. In this context, Japan's ODA will have the possibility to bring up the environmental industry in developing countries.

Above mentioned areas are categorized antipollution measures and other sectors (environmental administration) in Japan's ODA. I would like to introduce Japan's environmental cooperation in the following chapter and possibility to the development of environmental industry in Asian developing countries.

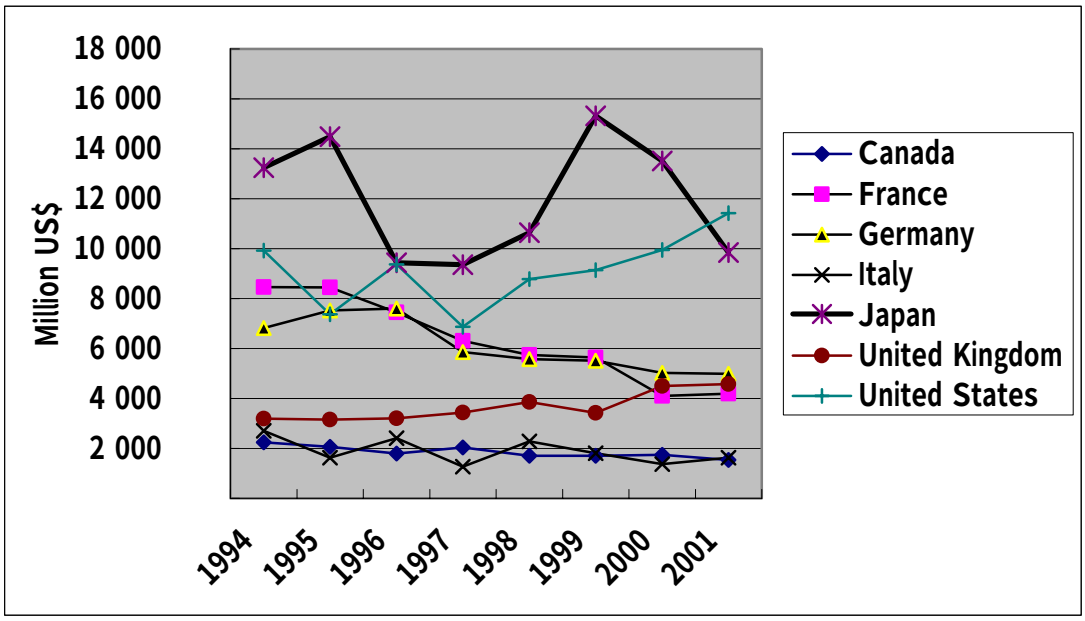
Figure1 Environmental ODA Results



Source: Ministry of Foreign Affairs of Japan

Japan's environmental cooperation has been expanding, and it reaches 452.5 billion yen in FY2000, an amount equivalent to about 31% of the total in committed that year (1.456 trillion yen). Assistance for residential infrastructure of environmental ODA increased up to 1996. After 1996, assistance for antipollution measures became main field of Japan's environmental ODA. The share is 61% in 1998, 40% in 1999, and 14% in 2000. In FY2000, other sectors of environmental ODA are expanding the share in environmental ODA and it shares 50% of environmental ODA. Other sectors include nature conservation, environmental administration, seawater contamination and global warming.

Figure2 Trends in Major DAC Countries' ODA (net disbursement basis)



Source: Ministry of Foreign Affairs of Japan

Note: Excluding aid to Eastern Europe

2) Policy Development in Environmental Cooperation

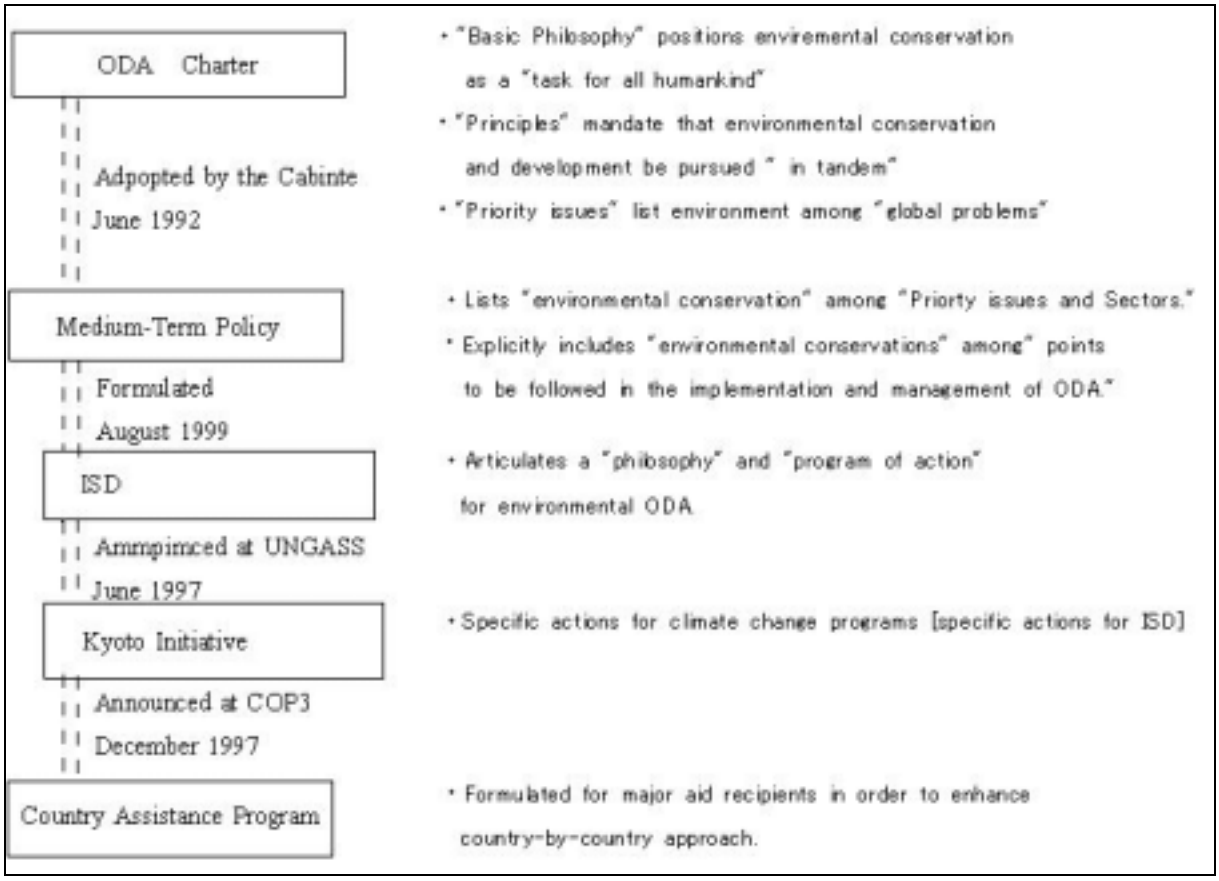
Japan became the largest donor country in the world in 1989. Then-prime minister Uno announced, at the Arche Summit in 1989, the Japanese government pledges to expand its environmental ODA up to 300 billion yen from FY1989 to FY1991. After this, Japan expanded environmental ODA consciously.

In order to clear Japanese philosophies and objectives for ODA, the Japanese government announced 4 ODA guidelines of its economic assistance to developing countries in 1991. The government will pay full attention to the following four points in implementing its economic aid:

1) the trends of the military expenditures of recipient countries,
2) the trends of their development and production of mass destruction weapons and missiles,
3) their export and import of arms, and
4) their efforts for promoting democratization and introduction of market-oriented

economy, and the situation regarding the securing of basic human rights and freedoms.

Figure3 Environmental Conservation within the Japanese ODA Framework



Source: Ministry of Foreign Affairs of Japan

In response to above-mentioned 4 ODA guidelines, the Cabinet adopted in 1992, Japan's Official Development Assistance Charter (ODA Charter) as basic philosophies of Japan's ODA. The ODA Charter lists (1) humanitarian considerations, (2) recognition of interdependence among nations of the international community, (3) environmental consideration, and (4) support for self-help efforts of recipient countries. The Japanese government is trying to faithfully follow these principles as the conduct of Japan's foreign assistance. Especially the environmental consideration is considered as the most

important matters.[1]

At the 1992 UN Conference on Environment and Development (the UNCED), Japan pledged to disburse between 900 billion and 1 trillion yen in environmental ODA over the ensuing five years. At the end of 1996, it had already disbursed 1.44 trillion yen, more than 40 percent over the pledged amount.

This led to the announcement by then-prime minister Hashimoto, in Special Session of the United Nations General Assembly on Environment and Development in 1997, Japan's comprehensive medium- and long-term plan for environmental cooperation, called the "Initiatives for Sustainable Development Toward the 21st Century" (ISD). ISD present Japanese basic philosophy on environmental cooperation, and constitute an action plan.

Philosophy of ISD is that Japan’s environmental cooperation will be extended in accordance with the following ideas; i) global human security, ii) ownership, iii) sustainable development, and following five areas are listed as the action program; i) air pollution (acid rain), water pollution, and waste disposal, ii) global warming, iii) nature conservation, iv) water issues, v) development of public and government awareness.

As the program for global warming, Japan presents "the Kyoto Initiative," in the policy framework of the ISD at the 3rd Conference of Parties to the United Nations Framework Convention on Climate Change (COP3) in Kyoto in 1997. The three pillars are summarized as follows;

i) Cooperation in capacity development

In the five years beginning in FY1998, Japan will train 3000 people in developing countries in the following fields: a) air pollution, b) waste disposal, c) energy saving technologies, d) forest conservation and afforestation.

ii) Official development assistance loans on the most concessional conditions

Japan will grant ODA loans with the most concessional terms available internationally (0.75% interest rate, 40 year repayment period) to actively promote cooperation in the following fields: a) energy saving technologies, b) new and renewable energy sources, c)

[1] ODA Charter is in the process of review in 2003, but the policy for emphasizing environmental cooperation will not change.

forest conservation and afforestation.

iii) Exploitation and transfer of Japanese technology and know-how

Using technology and know-how acquired in the process of combating its own pollution and energy problems, Japan will a) send teams to diagnose global warming prevention measures in manufacturing plants, b) set up information networks related to global warming prevention technology, c) develop and transfer technology suited to developing countries' needs, and d) hold workshops on global warming prevention.

At the 2002 Johannesburg summit, five years latter of announcement of ISD, Japan is issuing its Environmental Conservation Initiative for Sustainable Development (EcoISD), replacing the current ISD. Under the new concept of EcoISD, Japan will continue to extend environmental cooperation, mainly through its ODA, to support environment protection of developing countries. EcoISD is summarized as follows

1. Philosophy of EcoISD

1) Human Security
2) Ownership & Partnership
3) Pursuit of Environmental Conservation & Development

2. Principles of Environmental Cooperation

1) Capacity development in environment
2) Active integration of environmental considerations
3) Japan's leading role
4) Cooperation under a broad and comprehensive framework
5) Application of Japanese experience and scientific knowledge.

3. Action Plans

Japan will promote actions in the following four priority areas.

1) Efforts to Address Global Warming

   To raise awareness that global warming threatens to spoil sustainable development, to transfer to and spread over developing countries appropriate technologies as countermeasures against this problem, and to enhance capacity to address this issue from scientific, social and systemic perspectives.

2) Pollution Control

To provide support focusing on measures to control pollution and improve living standards (air & water pollution and waste management) in urban areas, mainly in the Asian regions in which economies are rapidly growing.

3) Fresh Water Issues
To support the implementation of both water supply and sewage systems, taking into account the characteristics of the target country's urban and rural areas, as well as to promote "soft" cooperation for water resource management and water quality control.

4) Conservation of Natural Environment
To support developing countries in the areas of the management of nature reserves, forest-related issues, prevention of desertification, and natural resources management, taking into consideration the efforts for eradicating poverty of local people.

4. New Efforts by Japan

Japan will undertake the following new efforts.

1) Human resources development totaling 5,000 in the environmental field over a five-year period from FY 2002.
2) Provision of yen loans with the most concessional terms for projects in environmental fields in order to give incentives to developing countries to resolve global environmental issues.
3) Enhancement of Japan's grant aid for global environment to promote cooperation for resolving the issue.
4) Promotion of wide-ranging collaboration with international organizations.
5) Further improvement of evaluation methods in order to make the ex-post evaluation of Japan's environmental ODA more effective.

2. Major Achievements and Issues in Japan’s ODA in Environment

1) Learning Lessons form Japanese Experiences in Air, Water and Urban Pollution

ODA has possibilities to improve environmental issues in the developing countries by transfer of experiences in industrialized countries. Many industrialized countries have

experiences of pollution, for instance, air pollution due to Sox, water pollution due to pollutant discharge, and complaints due to noise, vibration. Japan also has experienced industrial pollution and urban pollution.

Japan has obtained plenty of know how through overcoming industrial pollution problems in 1960s and urban pollution problems in 1970s. These Japanese experiences will contribute antipollution measures in industrialization of developing countries. For instance, technologies for air pollution, water pollution and waste disposal are listed as antipollution measures.

Adding these industrial pollution problems, natural environmental issues and global environmental problems are listed environmental issues. Japan's energy saving technologies, new and renewable energy sources and forest conservation and afforestation will be useful technology for developing countries. These technologies will contribute natural preservation and global environmental problems (i.e. global warming) .

Japan has assigned high priority to ODA projects in the environment field. From 1995, Japan reduce 0.2% of the interest of yen loan for environmental projects in order to promote environmental measures in developing countries. Japan began offering yen loans for environmental projects at special concessional terms (0.75 %, with a repayment period of 40 years) in 1997. Yen loan for environmental projects at special concessional terms will help the access to yen loan from developing countries.

Total amount of Japan's ODA in FY 2001 is 1.203 trillion yen, the amount decreases by around 17.8% form the previous year. In Japan's ODA of FY2001, yen loan for environment purpose is 22.8% of total yen loan. And also grant aid for environment is 22.6% of total Japan's grant aid. Technical cooperation for environment is 20.3% of total technical cooperation.

Statistical trend of Japan's ODA is shown in the following tables. In the environmental cooperation, grant aid peaked in 1997, loan assistance peaked in 1999, and technical cooperation peaked in 2001. From the view point of environmental field, antipollution measures, nature conservation, environmental administration, and seawater

contamination are main cooperation fields in 2001. These are reflecting the international trends for environmental cooperation. Various environmental problems acknowledged widely, for instance, the degradation of renewable natural resources, deterioration of urban environments due to rapid urbanization, pollution by industrialization and global environment issues.

Table1 Japanese Economic Cooperation in the Environmental Field

Table 1.1 Commitments by aid type

(Unit: ¥100 million)

FY	Grant aid	Loan assistance	Technical cooperation	Multilateral assistance	Total
1994	414.3 (33.6)	1,054.9 (12.4)	218.7 (15.9)	253.3 (6.5)	1,941 (14.1)
1995	428.2 (33.5)	1,708.2 (15.3)	222.9 (15.8)	400.3 (10.2)	2,760 (19.9)
1996	360.7 (27.8)	3,864.7 (29.7)	253.4 (16.9)	153.8 (11.3)	4,632 (27.0)
1997	364.6 (27.7)	1,623.4 (15.3)	300.7 (19.2)	158.1 (4.6)	2,447 (14.5)
1998	289.9 (25.9)	3,280.9 (30.2)	304.2 (19.6)	263.1 (10.2)	4,138 (25.7)
1999	293.7 (25.2)	4,644.5 (44.9)	282.5 (19.0)	136.0 (4.5)	5,357 (33.5)
2000	244.2 (22.5)	3,860.6 (44.5)	284.3 (18.2)	136.1 (4.7)	4,525 (31.8)
2001	242.0 (22.6)	1,498.1 (22.8)	324.4 (20.3)	157.7 (5.5)	2,222 (18.9)

Note:

1. arenthetical figures other than those in the "Total" column represent the share (%) of each type of aid in that particular year. "Grant aid"refers to the percentage of general grant aid extended that year. (It does not include grant aid for debt relief, non-project grant aid for structural adjustments, or grant aid for grassroots projects.) "Loan assistance"represents the percentage of the total (excluding loan assistance for debt relief) in project and non-project loan assistance, e.g., commodity loan assistance and structural adjustments lending.
2. The parenthetical figures in the "Total" column represent the share of total ODA committed that year.
3. Amounts for grant aid and loan assistance were calculated on a commitment (Exchange of Notes) basis; technical cooperation on a JICA disbursements basis; and multilateral assistance on a budget basis for contributions to multilateral institutions.

Table1.2 Bilateral technical cooperation

(1) (Actual JICA disbursements, including aid to Eastern Europe)

FY	Project-type technical cooperation			No. of development surveys	No. of independent supply projects
	No. of projects	Trainees accepted	Experts dispatched		
1994	48	143	457	79	18
1995	58	176	585	90	10

1996	74	160	545	98	10
1997	80	156	562	115	31
1998	81	170	593	120	19
1999	73	168	610	115	14
2000	47	132	449	110	8
2001	87	172	599	115	13

Note:

1. Project and personnel totals include figures for new as well as for ongoing programs. Instances of project-type technical cooperation include post-project follow-up cooperation.
2. Project-type technical cooperation is a type of technical cooperation which bundles expert assignments, trainee programs in Japan, and the provision of equipment.

(2) (Actual JICA disbursements, including aid to Eastern Europe)

FY	Trainees accepted		Experts dispatched		JOCV	
	No. of trainees	Share (%)	No. of experts	Share (%)	No. of experts	Share (%)
1994	1,192	12.7	325	10.9	116	10.3
1995	1,418	14.3	355	17.2	92	2.7
1996	1,559	14.5	284	9.4	116	11.7
1997	1,572	13.8	309	17.0	85	2.4
1998	1,758	8.9	279	13.6	102	2.9
1999	1,880	10.5	435	17.3	116	3.2
2000	2,277	13.0	505	14.9	132	8.0
2001	2,672	12.7	467	21.4	219	5.0

Note:

1. The annual personnel totals represent newly accepted trainees as well as new and continuing assignments for experts and JOCV staff.
2. Percentages represent the share of all personnel in a category in that year.

Table1.3 Statistics for bilateral assistance by environmental field

(Including aid to Eastern Europe; unit: ¥100 million)

FY	Residential infrastructure	Forest preservation	Antipollution measures	Disaster prevention	Other sectors
1994	1,128 (66.9)	87 (5.2)	362 (21.5)	58 (3.4)	52 (3.1)
1995	1,296 (54.9)	252 (10.7)	183 (7.7)	453 (19.2)	176 (7.5)
1996	2,803 (62.6)	372 (8.3)	609 (13.6)	429 (9.6)	266 (5.9)
1997	993 (43.3)	223 (9.8)	345 (15.1)	384 (16.8)	341 (14.9)
1998	538 (13.9)	82 (2.1)	2,353 (60.7)	226 (5.8)	676 (17.4)
1999	1,303 (25.0)	89 (1.7)	2,090 (40.0)	656 (12.6)	1,083 (20.7)
2000	1,025 (23.4)	168 (3.8)	608 (13.9)	421 (9.8)	2,167 (49.5)

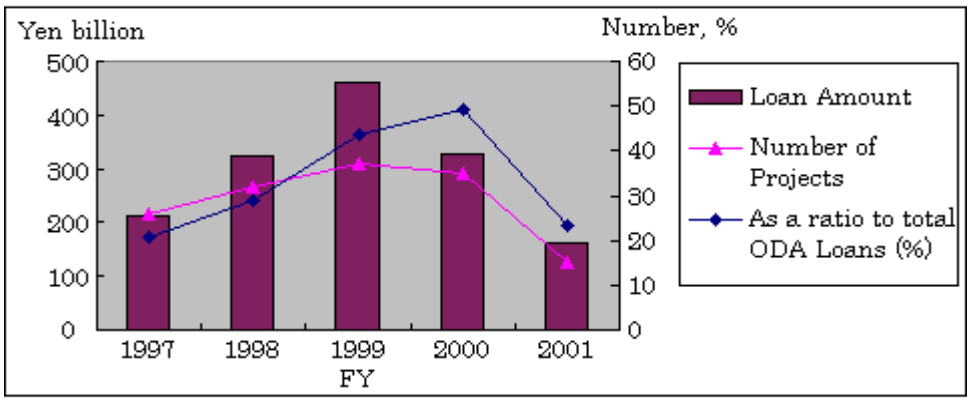
2001	238 (11.5)	143 (6.9)	640 (31.0)	295 (14.3)	748 (36.2)

Note:

1. Figures are totals for loan assistance, grant aid, and technical cooperation. Multilateral assistance is not included.
2. Percentages in parentheses represent the share of total ODA in the environmental field that year.
3. "Other sectors" include nature conservation, environmental administration, and seawater contamination.

Source: Ministry of Foreign Affairs of Japan

Figure4 Commitments by Yen Loan to Environmental Projects 1997-2001 (L/A basis)



Source: JBIC Internet Home Page
Note: The major reasons for a significant decline in commitments to environmental projects in fiscal 2001 are as follows:
1) The aggregate amount of commitments to China, which accounted for a large portion of the overall commitments to environmental projects in the several years up to fiscal 2000, declined in fiscal 2001. On top of that, initiating support for human resources development projects decreased the relative share of environmental projects.
2) Unlike the three years from fiscal 1998 through 2000, there was no commitment in fiscal 2001 to mass transit projects (such as an urban rail system to mitigate traffic congestion), which had taken up a large share of the overall commitments with their relatively huge funding requirements.

Recent Japan's environmental ODA is conducting under ISD (Initiatives for Sustainable Development toward the 21st century. The ISD plan comprises comprehensive package of Japanese guidelines ODA-led environmental policy and program. In the ISD plan, Japan will transfer Japanese appropriate technology and know-how to assist the environment conservation of developing countries. The programs and projects are classified 1) air pollution, Water Pollution, and Waste Disposal, 2)Global Warming (The Kyoto Initiative), 3)Nature Conservation, 4)"Water" Issues, and 5)Development of Public and Government Awareness. The main programs and projects are as follows;

1. Air Pollution (Acid Rain), Water Pollution, and Waste Disposal

i) Acid Deposition Monitoring Network in East Asia

- Monitoring of acid rain and development of technology (training courses)

ii) Cooperation through Environmental Centers

- Indonesia, China, Chile, Mexico and Egypt (P)

iii) Financial and Technical Cooperation

- China: Liuzhou Environmental Improvement Project III (O)
- China: Benxi Environmental Improvement Project II (O)
- Philippines: Local Government Units Support Credit Program (Two-Step Loan) (O)
- Philippines: Metro Manila Air Quality Sector Development Project (O)
- Sri Lanka: Environmentally Friendly Solution Fund (Two-Step Loan) (O)
- Indonesia: Plan for Training in Industrial Pollution Prevention Technology (O)
- Thailand: Automotive Fuel Research Project For Environmental Improvement (P)

2. Global Warming (The Kyoto Initiative)

i) Cooperation for Human Resources Development

- Course on Global Warming (training course)
- Professional Energy Conservation Centers (China, Turkey, Argentina and Bulgaria) (P)

ii) Most Concessional ODA Loans

- Thailand: MRTA System Project (Blue Line) (O)
- Malaysia: Port Dickson (Tuanku Jaafar) Power Rehabilitation Project (O)
- Viet Nam: Da Nhim Hydroelectric Powerplant Construction Project (O)

iii) Other Projects (countermeasures for rising sea levels)

- Maldives: Project for Seawall Construction on Male's Island III (G)

3. Nature Conservation

i) Biodiversity Conservation

- Indonesia: Biodiversity Conservation Project (P)
- "Parks in Peril" Program (Grant aid for a grassroots project)

ii) Coral Reef Conservation Network

- Project for the Establishment of the Palau Coral Reef Conservation Center (G)

iii) Promotion of Sustainable Forest Management and Strengthening of Cooperation against Desertification

- Laos: Project for Construction of Afforestation Center (G)
- Indonesia: The Forest Fire Prevention Management Project in the Republic of Indonesia (P)
- Malaysia: The Effective Wood Utilization Research Project in Sarawak in Malaysia (P)
- Thailand: Reforestation and Extension Project (P)
- Kenya: The Social Forestry Extension Model Development Project for Semi-Arid Areas in Kenya (P)

4. "Water" Issues

- Cambodia: Project for Improvement of Water Supply Facilities in Phnom Penh II (G)
- Niger: Plan for Clean Water Supply for Eradication of Guinea Worm (G)
- Mauritius: Sewage Treatment Facility Improvement Project (O)
- China: Shandong Yantai Water Supply and Water-Induced Disaster Management Project (O)
- Thailand: Technical Training Center for Sewage Works Project (P)
- Egypt: The Water Supply Training Improvement Project (P)

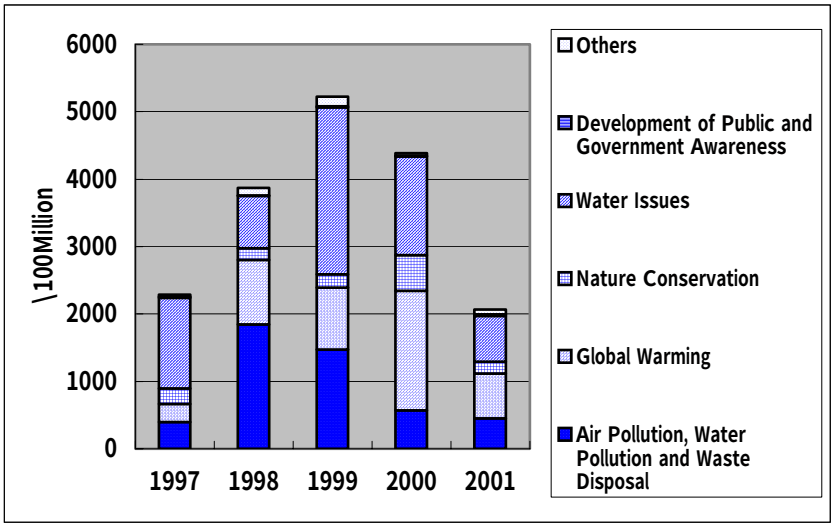
5. Development of Public and Government Awareness

- Active implementation of dialogue on policies for environmental cooperation
- Support for local conservation activities through the provision of grassroots grant aid

(G): Grant aid, (O): ODA loans, (P): Project-type technical cooperation

Source: Japan's ODA Annual Report 1999

Figure5 ISD Results 1997-2001



Source: Japan's Development Assistance White Paper 2002

2) Use of Environmental Guidelines for Mainstreaming Environmental Concerns into All ODA Programmes and Projects

Japan has been strengthening environmental programmes and projects in ODA from the end of 80s. But in the mainstreams of ODA projects, for instance, economic development projects like construction of road, hydroelectricity station and others, environmental considerations in the project development become the most serious

matters through the 80s. In some cases, Japan's ODA projects criticized as causes of deteriorations of the environment in the recipient countries. These environmental negative effects are not considered in the project design stages.

In 1988, Aid Study Committee on Environment was established by JICA to discuss Japan's ODA for the field of environment. In this committee, the environmental considerations that should be taken in the implementation of ODA were discussed as main issues.

Upon the recommendation of the committee, OECF (predecessor of JBIC) and JICA had guidelines on the consideration of environmental problems for the implementation of environmental impact assessment in ODA programs.

From 1990 through 1992, JICA formulated and implemented guidelines covering twenty sectors, for examples, guidelines for the investigation of environmental impacts concerning dam construction plans and guidelines for the investigation of environmental impacts concerning socioeconomic infrastructure improvements. JICA is reviewing these guidelines to give further consideration to the environment.

In 1989, JBIC formulated and implemented OECF guidelines for environmental considerations and revised the guidelines in 1995 for more environmental considerations. Also JBIC established "Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations" as unified guidelines for international financial operations and overseas economic cooperation operations in 2002.

The new guidelines adopt the common approaches of OECD, placing importance on dialogue with local residents, host countries and borrowers and promoting information disclosure. The checklist for the project approval included social considerations pertaining to resettlement, indigenous people and women. The following items are stipulated in the guidelines:

1. Classification of projects into three categories (A, B and C)[2] and criteria for

[2] 1. Category A: projects corresponding to at least one of the following items
(1) Large projects (both new and rehabilitation) of the following kinds:

classification

2. For Category A projects, submission of the Environment Impact Assessment Report to JBIC is required.

3. Basic rules for environmental considerations

3) Issues in Planning and Implementation: Limitations of Technical Cooperation in Environmental Policy Planning and Implementation

The technology transfer of environmental conservation to technicians was emphasized in the Japanese technical cooperation for developing countries. There are not so much cases the cooperation to environmental policy support for government of developing

---

1) Road and railroad, 2) Airports, 3) Ports and harbours, 4) Electric power generation, 5) Industry in general, 6) Mining development, 7) Forestry, 8)Irrigation, 9) Waste disposal, 10) Development necessitating submergence of large areas, 11) River basin development, 12) Development involving the manufacture or use of a large amount of hazardous and/or toxic materials or pesticides, and 13) Development involving reclamation affecting bodies of water.
(2)Projects implemented in, or which may affect, such areas as the following:
1) Areas where there is the danger of salt accumulation or soil erosion, 2) Semi-arid areas, 3) Natural forests in tropical areas, 4) Water sources, 5) Habitats of value to protection and conservation and/or sustainable use of fish and wildlife resources (including coral reef or mangrove ecosystems), 6) Areas of unique interest (historical, cultural or scientific), 7) Areas of concentrations of population or industrial activities, and 8) Areas of particular social interest to specific vulnerable population groups(nomadic people, etc., with traditional lifestyle)
(3)Projects with such characteristics as the following:
1) Projects expected to have a wide, diverse and irreversible environmental impact, 2) Projects affecting a large number of inhabitants (other than impacts resulting from involuntary resettlement), 3) Projects consuming a large amount of non-renewable natural resources, 4) Projects resulting in the occurrence of significant change in land use or the social, physical and/or ecological environment, and 5) Projects causing the generation or involving the disposal of a large amount of hazardous and/or toxic wastes.

2. Category B:
(1) Projects belonging to the following sectors and not belonging to Category A:
1) Road and Railroad, 2) Airports, 3) Ports and harbours, 4) Water supply, 5) Sewerage, 6) Electric power generation, 7) Electric power transmission, 8) Industry in general, 9) Mining development, 10) Oil and gas pipelines, 11) Diversion channels, 12) Forestry, 13) Irrigation, and 14) Waste disposal.
(2)Projects other than (1) and with a less remarkable environmental impact than a Category A project
(3)Engineering Service Loans provided for projects belonging to Category A.

3. Category C
(1)Projects not normally expected to have an environmental impact
(2)Certain telecommunication, education, human resource development projects, etc., may in certain cases, fall within this category.

countries.

Nowadays, environmental problems are recognized globally and diversified from natural degradation to global environmental problems. That is, adding to the environmental problems of the degradation of renewable natural resources, deteriorating urban environments by rapid industrialization and health problems by pollution, global environmental problems such as global warming, desertification, and the reduction in biodiversity are recognized as significant problems.

Under diversification of environment problems, the importance for the cooperation to environmental policy support was realized by Japanese environmental cooperation. Followings are recommended by 1st JICA's aid study committee on environment and realized as the important fields for environmental cooperation for policy support, 1) to develop appropriate human resources in developing countries, 2) to establish institutional frameworks for environmental management, 3) to prepare basic environmental conservation plans, 4) to find ways of identifying environmental problems, and 5) to systematically gather and compile environmental-related information.

Technical cooperation for environment must cope with above mentioned problems. In order to provide cooperation for tackling with these problems, it is important for ODA to introduce optimum policies and technologies for environment issues to recipient countries.

If ODA project implements without proper plan under proper research of the actual economic situation of recipient countries, there is a possibility to disturb the implementation of the project. In some cases, the recipient countries can not continue the project for the lack of the cost of management and maintenance for the project, and the lack of the cost to manage and maintain facilities and equipment.

Environmental problems are closely related other sectors, i.e. agricultural sector, industrial sector and infrastructure development. Main actors of these areas are the private sector. So ODA projects are needed to have cooperative relationships with the private sectors.

In some cases, private sectors are causes of environmental problems by their activities in developing countries. To cope with these issues, it is important to enact proper environmental laws and regulations and make circumstances to enforce these laws and regulations in developing countries. This will encourage by development assistance for environmental policy support for government in developing countries. And also environmental equipment supplied by ODA and trained human resources will provide the measures to enforce the environmental laws and regulations. It will need broad and comprehensive environmental cooperation to cope with environmental problems in developing countries.

As a specific case in the target countries of this study project, the following chapter introduces Japan's assistances for China. Project-type technical cooperation, namely The Japan-China Friendship Environmental Protection Center, is introduced as a cooperation to make effective impacts for environment and environmental industry in China.

In the project-type technical cooperation, JICA provides the team of experts to provide necessary support for recipient center, the provision of the necessary facilities, equipment and materials, and preliminary training for counterpart personnel.

Many developing countries do not have the proper technologies for environmental monitoring to check the present environmental problems. It is essential to strengthen technologies of scientific analysis for inspecting environmental problems. This is also essential to ensure the enforcement of environmental standards in developing countries. Japanese assistance by the project-type technical cooperation will provide the measures of these purposes. This type of cooperation will transfer the technologies and skills necessary for environmental monitoring to developing countries. And also, the cooperation will support to develop capability of policy-making for environment, promoting environmental standards, strengthening environmental organization. This will provide fundamentals to develop the environmental industry in developing countries.

3. Japan's Environmental Cooperation in Asia: Case in China

China is a country on special focus for Japanese ODA. China ranked third in terms of Japanese bilateral ODA in FY2000. From 1995 to 1998, China ranked first in bilateral ODA. Japan is China's largest donor country. Japanese ODA to China, mainly through yen loan, has contributed to the alleviation of infrastructure bottlenecks. China ranked first in terms of yen loan of Japanese ODA. The grant aid technical cooperation has contributed mainly to projects related to basic human needs as well as environment conservation and human resources development.

Japan focuses on the priority for the issues of environment in Japan's economic cooperation guideline for China. Japan's ODA to China places more emphasis on the areas such as the conservation of environments and eco-systems. The serious pollution is observed in China with rapid economic development. Chinese government strengthens their efforts to protect their environment. But they have not much financial resources and technology prevent the pollution. Japan provides yen loan for resolving environmental and other global issues.

By FY1999, environmental projects by yen loan are 14 projects of 19 projects. Also by FY2000, environmental projects are 20 of 23. These projects are water supply project, water works supply project, water pollution control project, sewage treatment project, environment model city project, environmental improvement project, and thermal power plant construction project.

A Japanese high-level mission on economic cooperation visited china in 1992, and both governments agreed that environment project will be made one of the future ODA priorities.

In 1995, Japan sent a joint public-private survey team to China in order to collaborate environmental issues between Japan and China. To foster a heightened exchange of views and opinions on themes in environmental cooperation, in 1996, Japan and China held the Japan-China Comprehensive Forum on Environmental Co-operation with participation by Japanese and Chinese government agencies, local municipalities, NGOs, and specialists.

In 1996, The Japan-China Friendship Environmental Protection Center opened by the

Japan's ODA. The establishment of this center was decided to commemorate the anniversary of the Japan-China Peace Treaty. Japan extended grant aid for the construction of the building as well as provided research equipment. It has also been implementing technical cooperation, including the dispatch of experts in wide-ranging fields.

The cooperation by environmental center approach is to encourage assuming the initiative to formulate environmental programs by developing countries. This type of cooperation will be effective for capacity enhancements and reinforce the environment-related administrative capabilities of developing countries. Japan has provided this kind of assistance to six countries; Thailand, Indonesia (see annex1), China, Chile, Mexico, and Egypt.

Now, the Japan-China Friendship Environmental Protection Center receives assistance form several other donors, including the U.S., Germany, Belgium, and the World Bank. It is expected that the desulfurization equipment which developed in this center will industrialize in near future.

China: The Japan-China Friendship Environmental Protection Center Project

Duration of technical cooperation (project-type)	1 September 1992~31 August 1995 (Phase I) 1 February 1996~31 January 2001 (Phase II)
Counterpart institution	National Environmental Protection Agency
Cooperation objectives	Phase I: The collection and analysis of environmental monitoring data, the study of pollution control technology, and the training of staff in environmental protection fields, to provide Chinese counterpart personnel to become staff of the Center with the necessary technical transference for the smooth opening of the Center in 1995. Phase II: The Center plays a leading role in the field of environmental research, training, and monitoring.
Project content	1. Environmental monitoring technology 2. Pollution control technology 3. Environmental information 4. Environmental strategy/policy research 5. Environmental education/public awareness 6. Human resources development for researchers

<table>
<tr><td>Cooperation</td><td>Grant aid: Around ¥10.5 billion in total
Technical cooperation (up to FY1998 for Phase II)<table><tr><td></td><td>Phase I</td><td>Phase II</td></tr><tr><td>Long-term experts dispatched:</td><td>11 persons</td><td>16 persons</td></tr><tr><td>Short-term experts dispatched:</td><td>12 persons</td><td>24 persons</td></tr><tr><td>Trainees accepted:</td><td>24 persons</td><td>18 persons</td></tr><tr><td>Provision of equipment:</td><td>¥93 mil.</td><td>¥94 mil.</td></tr></table></td></tr>
<tr><td>Counterpart country arrangements</td><td>Center staff: 282 persons
(full quota 410)
Center budget (FY1998): 16 million yuan</td></tr>
<tr><td>No. of trainees during cooperation period</td><td>1,800 persons (44 times)
(As of the end of October 1998)</td></tr>
</table>

At 1997 Japan-China summit meeting, Japan's and China's leaders reached an agreement on "Japan-China Environmental Cooperation toward the 21st Century." This agreement has two ideas for cooperation, i) the establishment of Environmental Information Network, and ii) the creation of environmental model cities.

The Environmental Information Network plans to make a nationwide environmental information network with the Japan-China Friendship Environmental Conservation Center as the core. For this purpose, computers will be installed to process environmental information in 100 major cities in China. In addition to installing computers, Japan cooperates in training human resources for the environmental information network.

The plan of environmental model cities is to select several cities and have them serve as models of efficient environmental planning for other cities. In the plan, Japan's assistance including ODA loans with most preferential terms for environmental projects, and technical assistance are intensively applied. These environmental measures, directed at reducing air pollution and acid rain, are aimed at generating successes that will encourage extension of conservation efforts in other cities and wider adoption of environmental policies throughout China. Chongging, Dalian, and Guiyang are selected

as the model cities:

- Implement measures against air pollution on a prioritized, intensive basis.
- Initiate water quality programs where conditions for implementation are met.
- Strive to cultivate recycling-oriented industries and social systems that are explicitly designed to utilize gypsum, fertilizer, and other by-products of emission-desulfurization processes.
- Implement measures against global warming that are geared to aid for programs of energy conservation.

Japan-China Environmental Model City Plan: Recommendations by Expert Committees (Overview)

1. Basic policy

(1) Measures to combat sulfur dioxide and soot, acid deposition control

(2) Formation of recycling-oriented industries and social systems

(3) Measures to combat global warming

In the above areas, air pollution prevention projects will be implemented on a prioritized, intensive basis, while appropriate consideration will also be given to projects to combat water pollution where conditions for implementation are met and to build environment management capacity.

2. Requests to governments and other related institutions

(1) Utilize schemes as diverse as possible in line with the nature of the project

(2) Emphasize human resources development and other "soft" aspects in tandem with development of "hard" aspects

(3) Consider the introduction of effective "cleaner production"

Full consideration should be given to the above points, and efforts made to ensure that concept objectives are met.

3. Follow-up arrangements

The Japanese and Chinese expert committees will review the overall progress of the concept and make recommendations to their respective government as the occasion demands.

Project lists for each model city

Chongqing City	Guiyang City	Dalian City
Recommended projects 1. Fuel Conversion Project for Small and Medium-size Boilers and Household Burning Facilities 2. The West Plant Flue Gas Desulfurization Engineering of Chongqing Power Plant 3. Desulfurization Project of Coke Oven Gas in Chongqing Iron and Steel (Group)	**Recommended projects** 1. Expansion of Coke Oven Gas Making Plant 2. Air Pollution Prevention at Guiyang Steel and Iron Plant 3. Flue Gas Desulfurization Engineering of Guiyang Power Plant 4. Automatic Monitoring on Major Emission Sources and	**Recommended projects** 1. Dalian Iron and Steel (Group) Company Electric Furnace Air Pollution Prevention Project 2. Dalian Pharmaceutical Plant Air Pollution Prevention Project Phase 1 3. Dalian Cement (Group) Company Dust Prevention Project

Company 4. Automatic Monitoring on Major Emission Sources in Chongqing 5. Production of Potassium Sulfate from Desulfurized Gypsum Collected from Power Plants 6. Chongqing Compressed Natural Gas Auto Engineering Project	the Ambient Environment in Guiyang 5. Guizho Cement Plant Dust Prevention Project 6. Lindong Clean Coal Project 7. Guizho Organo Chemical Plant Project	4. Yandao Chemical Industrial Estate Thermoelectric Project 5. Chunhai Thermoelectric Project Phase 2 6. Automatic Monitoring on Major Emission Sources and the Ambient Environment in Dalian
Projects to be Considered ・Bio-Briquette Plant Construction Project ・Coal Preparation Plant Construction Project ・The East Plant Retrofit and Flue Gas Desulfurization Engineering Project of Chongqing Power Plant	**Projects to be Considered** ・Guiyang Cement Plant Relocation and Air Pollution Prevention Project ・Guiyang Hongyan Chemical Plant Relocation and Air Pollution Prevention Project ・Flue Gas Desulfurization Engineering of Qingzhen Power Plant	**Projects to be Considered** ・Flue Gas Desulfurization Engineering of Hua Neng Power Plant ・Water Supply and Drainage Facility Construction in Lushun City ・Water Supply and Drainage Facility Construction in Zhuanghe City ・Water Resources Project in Wafangdian City
Estimated effect SO_2 122,000 tonne reduction (44 percent of total emissions) NOx 7,000 tonne reduction (12 percent of total emissions) Soot 15,000 tonne reduction CO_2 670,000 tonne reduction	**Estimated effect** SO_2 139,000 tonne reduction (68.5 percent of total emissions) Soot 51,000 tonne reduction (58.6 percent of total emissions) CO_2 618,000 tonne reduction * In the case that flue gas desulfurization engineering at Guiyang Power Plant is implemented on a reduced scale: SO_2 91,000 tonne reduction (44.8 percent of total emissions) Soot 33,000 tonne reduction (38.4 percent of total emissions)	**Estimated effect** SO_2 9,000 tonne reduction (5.6 percent of total emissions) Soot 36,000 tonne reduction CO_2 618,000 tonnes reduction

Nature of project lists

・Project lists are "long lists", and there is no obligation to implement all projects within a given time-frame.

・Implementation priority will be given to those projects on the lists which meet implementation conditions, bearing in mind the effect of the concept as a whole.

・The amount of investment in each project will not be taken into consideration in project selection.

・The Japanese expert committee has not prioritized the various projects. Lists are in the order provided

by the Chinese side.

Source: Ministry of Foreign Affairs of Japan

Above these Japanese cooperation, Green Aid Plan (GAP) is conducting as the environmental cooperation for industry. GAP launched by the Ministry of Economy, Trade and Industry since 1992.Japan currently implements Model Projects with China, Indonesia, Thailand, and Vietnam, to transfer technologies for environment protection and efficient use of energy.

The China-Japan-Korea Tripartite Environment Ministers Meeting(TEMM) has learned annually since 1999. The environment minister of three countries met in soul in 1999 and agreed to held TEMM for closer cooperation among three nations for sustainable development in Northeast Asia.

At the 1st TEMM, 6 priority areas in environmental cooperation were selected by the tree nations.

1) Improvement of awareness in "environmental community",
2) Vitalization of information exchange,
3) Cooperation in environmental research,
4) Cooperation in environmental industries and technologies,
5) Pursuing measures to prevent air pollution and to protect the marine environment,
6) Addressing global environmental issues.

At the 2nd TEMM, 5 prioritized areas of mutual cooperation among three countries were set.

1) Raising consciousness of the environmental Community,
2) Fresh water(lake) pollution prevention,
3) Land-based marine pollution prevention,
4) Cooperation in the environmental industry,
5) Environmental conservation in Northwest China.

As to the environmental industry, the 1st Roundtable Meeting on Environmental Industry was held in soul in 2001 and discussed the definition and scope of environment industry in each country. The 2nd Roundtable Meeting on Environmental Industry was

held in Awaji, Japan in 2002. Chairperson summarizes the result of discussion in the 2nd Roundtable Meeting on Environmental Industry as follows;

1) It is recognized that environmental industry has been rapidly expanding in recent years and that it will be one of the most important industries in the future in China, Korea and Japan.
2) It is acknowledged that the corporate approach to environmental protection is changing from “end-of-pipe” measures to cleaner production and, furthermore, to environmental products and services.
3) It is recognized that government policies have long served as effective incentives for the development of environmental industry. The role of industries themselves is, however, likely to become increasingly important, and further corporate voluntary initiatives and responses to interest from the public are required. Environmental industry will be further developed if industries adapt to social changes in a proactive way and view environmental issues as new business opportunities.
4) It is becoming clear that each country faces different gaps and barriers according to its stage of development. China ’s problems relate to technology diffusion, Korea needs more incentives to induce environmental investment, and Japan needs to improve the cost performance of environmental industry.
5) Consideration should be given to the following three points in entering other countries’ environmental markets:
    i. Putting priority on technology transfer
    ii. Building a good, cooperative partnership with the host country
    iii. Having a long-term perspective

Japan’s environmental ODA is providing cooperation for many environmental areas, as mentioned, technology to prevent pollution, institution building for government, human resource development, providing monitoring equipment. And today, the cooperation was enlarged the stage to discuss the environment industry in the Roundtable Meeting on Environmental Industry. Japan’s ODA will provide the fundamentals of development of environmental industry in future.

4. Possible Impat of Japan’s ODA on Environmental Industry

With rapid industrial development in developing countries, emission of sulfur oxides, nitrogen oxides and carbon dioxide have increased. These emissions causes an acid rain problem and acid rain problems go over the border for a wide area.

The problems of air pollution and water pollution were the problems that Japan faced in the past. Japan's past experiences and know-how in overcoming environment problems will be useful to resolve environmental problems in developing countries. Local governments and private companies in Japan have accumulated know-how. To utilize these experiences, positively, Japan has to provide know-how to developing countries. So Japan's environmental ODA has much priority to the cooperation to industrial pollution control.

Environmental issues in developing countries cannot resolve solely. But most important matter in developing countries is to tackle environmental issues on their own initiative. It is most important that developing countries have self-help efforts to the environmental issues.

Technology transfer of pollution control to developing countries is help their self-help efforts to the environmental issues, and it will support the development of environmental industry in developing countries. Japan's environmental ODA puts priority to combine effective enforcement on regulation and technological and financial cooperation.

In the developing countries, the pollution by private companies is most serious problems. But ODA is a scheme for cooperation government-to-government basis, so it is impossible to assist private companies directly by ODA. The two-step-loan, a modality of Japanese ODA, is available for private companies in developing countries. It will help the development of environmental industry, if private companies be able to get the financial resources by Japan's ODA to buy antipollution equipments. This assistance will bring up the market of environmental industry.

Green Aid Plan (GAP) is also useful cooperation to promote technology and know-how for environment problems in developing countries. GAP is cooperation in the field of environment and energy, which develop and transfer low-cost and easy handle

technologies appropriate to developing countries.

Cleaner production (CP) is listed as useful cooperation for environment issues. CP has been adopted by many donors as environmental management programs in developing countries as a Win-Win approach to industrial environmental management. CP realizes the enhancement of plant production performance and the reduction of environmental loads.

In Japan, JICA is studying the potential problems in CP-related cooperation as follows;

1) Enterprises in developing countries are reluctant to make an investment in pollution control, and also less conscious of production control and environmental management.
2) There are only a limited number of governments and private organizations that provide effective consultation services for industrial environmental management, including enhancement of production performance.
3) Environmental regulations are ineffective to motive enterprises to introduce an environmental management system.
4) Donors are also groping for any effective approaches (including prevention of global warming) other than strengthening of regulations.

The mechanism to promote the CP is not developed yet in developing countries. The biggest problems to promote CP production are the difficulty of communicating information and lack of human resources in developing countries.

JICA proposes following strategic approaches for future cooperation;

- Strategy 1: Changing priority from a regulation- and EOP-oriented approach to a market mechanism- and CP-oriented approach
- Strategy 2: Development of CP promotion policies with emphasis on private sector activities
- Strategy 3: Development of promotion measures interrelated to SME promotion policies
- Strategy 4: Organizing Japanese experiences

Japan’s environmental ODA is contributing environmental issues in many fields in

developing countries. These cooperation will provide the fundamentals of development of environment industry in-direct way.

ODA's most important contribution to environment issues is cooperation for human resource development. This will help self-help efforts of developing countries to the environmental issues. By this, the government of developing country is able to develop institution building to tackle with environmental issues and to make effective enforcement of regulation for environment issues. In the case of China, this was done through the cooperation of the Japan-China friendship environmental protection center. Japan-China environmental model city is another way of cooperation. This plan is directly tackle the environmental problems. The combination of two types of cooperation gives positive effects to China.

The effective regulation for environment and its proper implementation is the priming water of development of environmental industry. At this sense, ODA contribute the development environmental industry in directly. If government of developing country earnestly tackles with environment issues under their environment regulation, it will attract foreign companies which has many effective technologies for environmental matters.

Reference

Ministry of Foreign Affairs of Japan(MOFA), 1994—2000, Japan's ODA Annual Report 1994-2000, Tokyo, MOFA

----, 2001—2002, Japan's Development Assistance White Paper2001and 2002, Tokyo, MOFA

----, 1997, Initiatives for Sustainable Development Toward the 21 Century (ISD), Tokyo, MOFA

----, 2002, Environmental Conservation Initiative for Sustainable Development (EcoISD),

Tokyo, MOFA

Ministry of the Environment(MOE), 2001, Progress Report on the Tripartite Environment Ministers Meeting among China, Japan and Korea, Tokyo, MOE

Japan International Cooperation Agency (JICA), 2001, The Second Study on Development Assistance for the Environment, Tokyo, JICA

----, 2001, Report on Promoting Cleaner Production in Developing Countries, Tokyo, JICA

Japan Bank for International Cooperation (JBIC), 2002, Environmental Report 2002, Tokyo, JBIC

URL of Ministry of Foreign Affairs of Japan:
http://www.mofa.go.jp/policy/oda/index.html

URL of Japan Bank for International Cooperation:
http://www.jbic.go.jp/english/environ

URL of Japan International Cooperation Agency:
http://www.jica.go.jp/english/index.html

Annex 1

Japan's cooperation by environmental center approach in Asian countries

	Indonesia: The Environmental Management Center (EMC)
Duration of technical cooperation (project-type)	1 January 1993~31 December 1997 1 January 1998~31 March 2000 (extension)
Counterpart institution	Environmental Impact Management Agency
Cooperation objectives	To strengthen capacity of environmental management through environmental research and monitoring activities and information systems in the fields of water pollution, toxic substances and other environmental subjects, and

	environmental training for human resources development in the primarily government organizations concerned, and to improve the quality of environment in the Republic of Indonesia.
Project content	1. Water pollution 2. Air pollution 3. Toxic substances 4. Noise and vibration 5. Information systems 6. Environmental engineering 7. Environmental impact assessment 8. Environmental biology 9. Other environmental subjects (1~3: main fields, 4~9: when required)
Cooperation	Grant aid: Around 2.7 billion in total Technical cooperation (up to FY1998) Long-term experts dispatched: 17 persons Short-term experts dispatched: 40 persons Trainees accepted: 35 persons Provision of equipment: Around ¥320 million
Counterpart country arrangements	Center staff: 94 persons (52 engineers) Center budget (FY1998): 370 million rupiah FY1993-98 cumulative total: Around 4.8 billion rupiah
No. of trainees during cooperation period	303 persons (13 times) (As of the end of August 1999)

	Thailand: The Environmental Research and Training Center (ERTC) Project
Duration of technical cooperation (project-type)	1 April 1990~31 March 1995 1 April 1990~31 March 1997 (extension) Cooperation already completed.
Counterpart institution	Ministry of Science, Technology & Environment (MOSTE) Environmental Research and Training Center (ERTC)
Cooperation objectives	To promote and strengthen research training and monitoring activities in the fields of water pollution, air pollution, noise and vibration, solid waste, toxic substances and so forth in ERTC, and thus to improve the quality of the environment in the Kingdom of Thailand.
Project content	Technology transfer related to research, training and monitoring in the following areas: 1. Water pollution

	2. Air pollution 3. Noise and vibrations 4. Solid waste 5. Toxic substances 6. Environmental administration 7. Environmental impact assessment 8. Environmental data processing 9. Environmental education
Cooperation	Grant aid: Around ¥2.3 billion in total Technical cooperation Long-term expert dispatch: 41 persons Trainees accepted: 33 persons Provision of equipment: Around ¥200 million
Counterpart country arrangements	(As at project completion date) Center staff: Around 70 persons Center budget: 61.50 million bahts
No. of trainees during cooperation period	ERTC trainees: 956 persons Local trainees: 890 persons Training guidance training: Around 150 persons

Section II:
Major Contributions of Japanese Multinational Corporations to Environmental Industry Development in Developing Asian Countries

Introduction

The environmental industry usually means the industry, which contributes to decrease the environmental load by the production of pollution control equipment. But nowadays many companies pay attention to the environmental consideration in their corporate activities including the production process in domestic and abroad. Environmental considerations of Japanese multinational companies in the target countries of this project, China, India, Indonesia and Republic of Korea, are focused as main themes in this part.

Production activities of multinational companies in developing countries have a possibility to improve environmental consciousness of the people and society of developing countries. This will lead same goal for environmental problems as done by the production of pollution control equipment. Also it increases the demands of pollution control equipment. Under this process, the market for the environmental industry will be developed in the developing countries.

1. The development of environmental industry in Japan

Japan has experienced the industrial pollution problems in 1960s, and many Japanese companies were insisted to set up pollution control equipment. In the middle of 1970s, urban pollution problems have emerged, and some companies found this for business chance to utilize the technology and know-how obtained through overcoming industrial pollution, such as waste water management. This is the start point of environmental industry in Japan. In the middle of 1980s, it became to focus on global environmental problems, particularly global warming, and environmental industry experienced new development as the field of efficient use of energy and promotion of recycling business, and so on.

The total amount of environmental equipment production in Japan is 1,690 billion yen in 2001. Water pollution control equipment and waste treatment equipment occupy a

major part of the production. The export amount of environmental equipment is 41 billion yen. It is only 2.4% of the total, so the activities of the industry in overseas are not a big scale yet. The East Asia is the biggest export area. Japan exports 200.2 billion yen (49.2% of the export of environmental equipment) in FY 2001. Major export countries are Taiwan (9.8 billion yen, 23.9% of the export), China (5.1 billion yen, 12.4%), USA (2.5 billion yen, 6.0%). Licensing of environmental technology for abroad in FY2001 is 20 cases. It increased 4 cases compared to FY2000. The major licensed countries are Korea (10 cases) and China (5 cases).

The forecast of market size and employment in Japanese environmental industry by the Ministry of Environment is shown in the table 3. The market size of environmental industry in 2020 will increase to 58.4 trillion yen, 2 times of 2000. The employment of environmental industry will increase to 1.2 million people, 1.6 times of 2000. In the trend of strengthening the regulations for solid waste management, the statistic estimates the growth of solid waste management service in the market size and employment. In the case of air pollution control and waste water management, the growth for production of equipments are estimated highly. These are reflecting that some environmental issues needs for development of production of equipments, and others are needed provisions of services. No. 15 of table 3, analytical services, data collection, analysis and assessment, will mean environmental monitoring and analysis. This service estimated steady growth in response to the development of environmental industry.

Table 1: Production of environmental equipment in Japan

(Unit: 100 million yen)

	1980	1985	1990	1995	2000	2001
Air pollution control equipment Water pollution control equip. Waste treatment equipment Noise and vibration control equipment	1,601 3,521 1,364 65	1,477 3,225 1,789 38	1,542 3,921 2,322 65	3,220 6,140 6,770 97	2,612 7,712 6,029 80	2,122 6,283 8,389 103
Total	6,551	6,528	7,850	16,226	16,432	16,897

Source: The Japan Society of Industrial Machinery Manufacturers

Table 2: Export of Environmental Equipment from Japan

See 1015Nakaune TABLE Styled. Doc

Table 3: Forecast of environmental industry in Japan

	Market size(100 mil.Yen)			Employment (person)		
	2000	2010	2020	2000	2010	2020
Pollution management	95,936	179,432	237,064	296,570	460,479	522,201
Production of equipment, etc.	20,030	54,606	73,168	27,785	61,501	68,684
1.Air pollution control	5,798	31,660	51,694	8,154	39,306	53,579
2.Wastewater management	7,297	14,627	14,728	9,607	13,562	9,696
3.Solid waste management	6,514	7,037	5,329	8,751	6,676	3,646
4.Remediation and clean-up of soil, surface water and groundwater	95	855	855	124	785	551
5.Noise and vibration abatement	94	100	100	168	122	88
6.Environmental monitoring, analysis and assessment	232	327	462	981	1,050	1,124
7.Other	-	-	-	-	-	-
Provision of service	39,513	87,841	126,911	238,989	374,439	433,406
8.Air pollution control	-	-	-	-	-	-
9.Wastewater management	6,792	7,747	7,747	21,970	25,059	25,059
10.Solid waste management	29,134	69,981	105,586	202,607	323,059	374,186
11.Remediation and clean-up of soil, surface water and groundwater	753	4,973	5,918	1,856	4,218	4,169
12.Noise and vibration abatement	-	-	-	-	-	-
13.Environmental R&D	-	-	-	-	-	-
14.Environmental contracting and engineering	-	-	-	-	-	-
15.Analytical services, data collection, analysis and assessment	2,566	3,280	4,371	10,960	14,068	17,617
16.Education, training, information	218	1,341	2,303	1,264	5,548	8,894
17 .Other	50	519	987	332	2,487	3,481
Construction& installation	36,393	36,985	36,985	29,796	24,539	20,111
18.Air pollution control	625	0	0	817	0	0
19.Wastewater management	34,093	35,837	35,837	27,522	23,732	19,469
20.Solid waste management	490	340	340	501	271	203
21.Remediation and clean-up of soil, surface water and groundwater	-	-	-	-	-	-
22.Noise and vibration abatement	1,185	809	809	956	536	439
23.Environmental monitoring, analysis and assessment	-	-	-	-	-	-
24.Othter	-	-	-	-	-	-

Cleaner technology& products	1,742	4,530	6,085	3,108	10,821	13,340
1.Cleaner/resource-efficient technologies and processes	83	1,380	2,677	552	6,762	9,667
2.Cleaner/resouece-efficient products	1,659	3,150	3,408	2,556	4,059	3,673
Resource management	201,765	288,304	340,613	468,917	648,043	700,898
1.Indoor air pollution control	5,665	4,600	4,600	28,890	23,461	23,461
2.Water supply	475	945	1,250	1,040	2,329	2,439
3.Recycled materials	78,778	87,437	94,039	201,691	211,939	219,061
4.Renewable energy plant	1,634	9,293	9,293	5,799	30,449	28,581
5.Heat/energy saving and management	7,274	48,829	78,684	13,061	160,806	231,701
6.Sustainable agriculture and fisheries	-	-	-	-	-	-
7.Sustainable forestry	-	-	-	-	-	-
8.Natural risk management	-	-	-	-	-	-
9.Eco-tourism	-	-	-	-	-	-
10.Other	107,940	137,201	152,747	218,436	219,059	195,655
Total	299,444	472,266	583,762	768,595	1,119,343	1,236,439

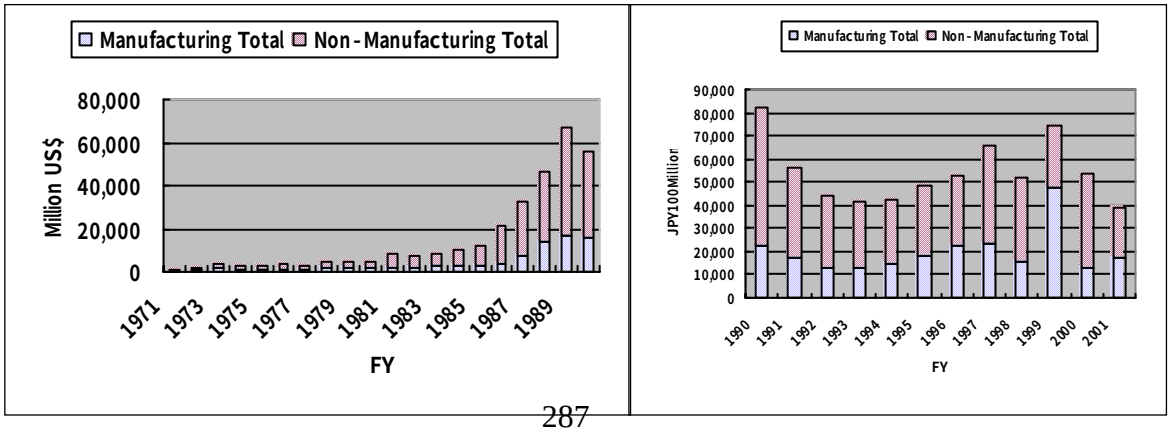
Source: Ministry of Environment, May 29, 2003. Estimation by OECD classification

2. Environmental considerations of Japanese companies in Asian countries and Impact for environmental industry

1) Foreign Direct Investment of Japanese companies

Foreign direct investment (FDI) of Japanese companies increased greatly in 1970s. Many Japanese companies established factories in abroad, especially in the Southeast Asian countries, to keep their international competitiveness under the high appreciation of the yen after Nixon shock in 1971. At that time, there are a few cases which criticism was taken for Japanese companies from the local society because of insufficient environmental consideration in the operation.

Figure 1 Japanese Foreign Direct Investment



Japanese companies' foreign direct investment has been increasing up to now. Especially after Plaza agreement in 1985, the amount and cases of Japanese companies' foreign direct investment increased dramatically and the region also expanded form the Southeast Asian countries to all over the world, especially North America. But Southeast Asian countries still remained major investment area of Japanese manufacturing companies.

Indonesia was the country that was invested the biggest amount of FDI from Japan until the beginning of 1990s. At the beginning of 1990s, China appeared as a main investment country from Japan with her development of market economy. By the statistical data of Japanese foreign direct investment in 2001, 20% of Japanese FDI was directed to Asia (for 33% of Europe and for 20% of North America). For the target countries of this study project, China shares 23% of total Japanese Asian investment, Republic of Korea is 9%, Indonesia is 7%, and India is 2%.

In the operation of Japanese manufacturing companies in foreign countries, especially in developing countries, it often discusses about insufficiency of the environmental consideration in production, and inability of implementation of regulation and rules by local government. If multinational companies make appropriate environmental production system in developing countries under proper environmental administration of local government, environmental consciousness in local society will increase and the opportunity to market formation of environmental industry will be increased. Also local companies have the chance to learn the environmental technology from multinational companies.

2) Japanese companies' environmental consideration in Asian countries

According to "the research report of environmental management of Japanese multinational companies in ASEAN 5 countries (Indonesia, Malaysia, the Philippines, Singapore and Thailand) in 1990" and "the research report of environmental management of multinational companies in ASEAN 5 countries in 1991" published by Japan Overseas Enterprises Association, the following points are listed as the environmental issues of the corporate activities in ASEAN countries (In the survey of 1990, 107 Japanese companies responded for distributed 342 questionnaires. The survey of 1991 was conducted by on-site interviews for 53 companies which are non Japanese multinational companies and local companies.);

The results of 1990 survey (for Japanese companies)

1) Environmental measures: 3/4 of answered companies are conducting environmental measures. In the case of small capital companies fewer than 1 billion yen, there are many cases which are not conducting environmental measures.
2) Main environmental measures; Air pollution control and water pollution control are emphasized. And tree planting around factory and industrial waste disposal are also emphasized. In the Thailand, Indonesia and Singapore, companies are insisted to take measures water pollution control.
3) Main reasons for environmental measures: Companies are conducting environmental measures to cope with environmental laws and regulations and government guidance. Environmental measure is one of the requirements for the approval of foreign investment in Indonesia and Thailand.
4) Environmental standards: many companies answered that they were using the Japanese environmental standards or more strict standards. In Indonesia, many companies are usually using local environmental standards.
5) Problems of environmental measures: The answers indicated the defect of environmental laws and regulations and shortage of local environmental experts.

The results of 1991 survey (for non-Japanese multinational and local companies)

1) Environmental measures: Air pollution control, water pollution control and industrial waste disposal are emphasized in this order.
2) Main reasons for environmental measures: Companies are conducting environmental measures to cope with environmental laws and regulations and requests by inhabitants. Foreign based multinational companies are conducting environmental measures autonomously compared to local companies.
3) Environmental standards: Local companies are using local environmental standards. Multinational companies are using several standards by their own policy, i.e. local environmental standard, the environmental standard of head office and own environmental standard by location. The reason of using own environmental standards in each subsidiary is that the environmental standards of head office is too strict to use in the local production.
4) Problems of environmental measures: The answers indicated the defect of environmental laws and regulations, shortage of local environmental experts and lack of environmental industry.

The indications of 2 years study are as follows;

1) There are not specific differences for environmental measures between Japanese multinational companies and other multinational companies.
2) Environmental legal system and regulatory standards are not sufficient for environmental protection in ASEAN countries. This cause to make light of environmental measures of companies and to increase the investment of "the pollution enterprise" from the foreign countries.
3) Even if the legal system and regulation is well prepared, it is not yet implemented as effectively as desired. The implementation of the laws and regulations may be done arbitrarily in some country; this will reduce the mind of environment measures.
4) The expert of the environmental area is insufficient. A company must expenditure more cost for sufficient environment measures. For instance, implementation system of the industrial waste does not develop to fit the requirements of companies.
5) In the case of above-mentioned 2), many multinational companies use a local environmental standard in their factory, which is looser than their host country.

The environmental measures do not develop well in both area of software (i.e. government administrative system for environment and education system of environmental specialist) and hardware (i.e. pollution control equipment) in the ASEAN countries. Although the environmental measures are needed in the ASEAN countries, it is in the condition that the environmental efforts can’t catch up with the speed of industrialization. Government of ASEAN countries has to do in proceeding with the environmental infrastructure and environmental related law.

Otherwise the next points are being raised as the subjects which enterprises are asked for in the operation in these countries.

1) Foreign multinational enterprises aren't almost using leading environmental technology corresponding to the severe standard of home country in the operation of developing countries. Technology transfers of advanced environmental technology form multinational enterprises are expected in developing countries. But those expectations are not fully done. Multinational companies, which have much capital sources and technological capabilities, should take leadership to cope

with environmental problems.

2) There are differences by the enterprise for their environmental measures. It concerned with "corporate philosophy". Multinational companies are requested their environmental friendly behavior based on the lessons from history of corporate activities.

In the above-mentioned research in 1991, following points are listed as Indonesian findings, the target country of this study project (Research samples are; 3 cases of non-Japanese multinational enterprises and 6 cases of local companies). These findings are pointed out same tendency of the research results of other ASEAN 4 countries.

After the enactment of the environmental management act in 1982, environmental regulations on business operations are strengthening. Foreign companies must to present “company’s policy document for environmental pollution control” with the approval process for foreign direct investment to Indonesia. And also, government of Indonesia requires environmental impact assessment for the project, which has possibility to affect serious impact for the environment.

1) The environmental measures, which has been emphasized: Air pollution control, water pollution control, industrial waste disposal and tree planting around factory.
2) The main reasons for environmental measures: to cope with environmental laws and regulations and government guidance. It is appeared that many companies are tackling with environmental issues in order to meet government request.
3) The problems for environmental measures: The defect of environmental laws and regulations, the difference of environmental standard in the central government, the local government and each ministry and shortage of local environmental experts.
4) Environmental standards: Each company has taken each environmental standard in each country, i.e. local environmental standard, the environmental standard of head office and own environmental standard by location. The reason of using own environmental standard in each subsidiaries is that the environmental standard of head office is too strict to use in the local production.
5) Environment public relations for the local community: Public relations activities are done for the government rather than the local society and people. Local companies are more active for the public relations activities to the government such as “to explain business activities to make good understand for the persons

concerned in government" and "to invite government environmental specialist for seminar in the factory."

In 1966, 5 years after of the above-mentioned research, Global Environmental Forum published, "Research Report on Trends in Environmental Considerations related to Overseas Activities of Japanese Companies". The survey by a questionnaire and on-site interviews was conducted in 1965 for the Japanese companies engaged in business in four Asian countries; the Philippines, Thailand, Indonesia and Malaysia. 425 Japanese companies responded for distributed 2,070 questionnaires (the return rate was 20.5%). For the survey in Indonesia, one of the targets countries of this project, the questionnaire was sent to 316 companies, of which 96 responded (30.4% by those in manufacturing).

The main findings of the survey in Indonesia are as follows (the figures in the parentheses show the average of the three Asian countries, the Philippines, Thailand and Malaysia.);

1) Environmental measures before establishing business overseas; the companies legally obliged to carry out environmental assessments accounted for 32.3% (27.7%). But a far larger percentage of 45.8% (46.2%) of all companies responded actually conducted environmental assessments.
2) Environment management policy; the companies have their own environment management policy accounted for 36.5%(32.5%). Half of the response is interesting to set up own corporate environment management policy.
3) Attitudes of companies toward environmental issues; Regarding the expenditures or investments for environmental conservation, 63.6% (77.2%) of those responded was willing to do more than the minimum requirements to satisfy the current regulations. 19.8% (20.7%) of these were willing to bear the necessary cost regardless of the company's business performance.
4) Environmental issues in the operations; 25.0% (27.7%) of companies was to be regulated by local governmental bodies in terms of air and water pollution, etc. 21.9% (21.3%) of companies reported the results of measurements of air and water pollution to the local authorities. 18.8% (19.7%) of the companies have encountered some environmental problems in the operation, including minor ones such as no significant effects outside the company premises. Among the environmental problems encountered, the issue related to discharge of pollutants into water was the highest, accounting for 48.0% (48.6%), followed by issues

related to vibration and noise accounting for 20.0% (10.8%), odors 16.0% (18.9%), and the treatment and disposal of solid waste 12.0% (20.3%). Some companies revealed that they are unable to find proper disposal sites, and kept the solid waste within the premises. In the future, 24.0% (24.3%) of the companies anticipate the possibility of some environmental problems arising. Among the issues anticipated, the issues related to discharge of water pollutants was the highest, accounting for 52.2%(37.5%), followed by treatment and disposal of solid waste 43.5%(56.3%), emission of air pollutants 26.1%(26.3%) and vibration and noise 21.7%(30.0%).

In the findings of survey, Japanese companies are tackling with environmental issues in positive way, although the legal system and regulation for the environment and its implementation system are not sufficient in ASEAN countries. Half of the response conducted environmental assessments and set up their own corporate environment management policy. 75% of the response is willing to invest for environmental conservation more than the minimum requirements to satisfy the current regulations. But many Japanese companies express concern to the environmental problems for issues related to discharge of water pollutants and treatment and disposal of solid waste and emission.

3) Positive step of Japanese industries for environment issues

Nowadays, many Japanese companies take into consideration for environment issues in their foreign investment as a same in domestic activities. As the background of this, it is important following efforts by Japanese companies in the long run.

In 1991, Keidanren (Japan Federation of Economic Organizations) instituted the Keidanren global environment charter. In the charter, Keidanren appealed that “Japan must not rest content with its good record in pollution control thus far. The business world, academic circles, and government must pool their resources to create innovative technologies for preserving the environment, conserving energy, and cutting back on resource consumption. While drawing on the Japanese experience in reconciling economic development with environmental protection, we must actively participate in international environmental undertakings. Concerning such problems as global warming, we should support the efforts on more scientific research into their causes and effects and also begin work immediately on the feasible countermeasures. “

And in the charter, companies operating overseas shall observe the Ten-Points-Environmental Guidelines for the Japanese Enterprises Operating Abroad in Keidanren's Basic Views of the global environment problems(April 1990).

Ten-Points-Environmental Guidelines are as follows;

1) Establish a constructive attitude toward environmental protection and try to raise complete awareness of the issues among those concerned.
2) Make environmental protection a priority at overseas sites and, as a minimum requirement, abide by the environmental standards of the host country. Apply Japanese standards concerning the management of harmful substances.
3) Conduct a full environmental assessment before starting overseas business operations. After the start of activities, try to collect data, and, if necessary, conduct an assessment.
4) Confer fully with the parties concerned at the operational site and cooperate with them in the transfer and local application of environment-related Japanese technologies and know-how.
5) Establish an environmental management system, including the appointment of staff responsible for environmental control. Also, try to improve qualifications for the necessary personnel.
6) Provide the local community with information on environmental measures on a regular basis.
7) Be sure that when environment-related issues arise, efforts are made to prevent them from developing into social and cultural frictions. Deal with them through scientific and rational discussions.
8) Cooperate in the promotion of the host country's scientific and rational environmental measures.
9) Actively publicize, both at home and abroad, the activities of overseas businesses that reflect our activities on the environmental consideration.
10) Ensure that the home offices of the corporations operating overseas understand the importance of the measures for dealing with environmental issues, as they effect their overseas affiliates. The head office must try to establish a support system that can, for instance, send specialists abroad whenever the need arises.

Also, Keidanren declared Keidanren Appeal on Environment, "Declaration on Voluntary Action of Japanese Industry Directed at Conservation of Global Environment in the 21st Century" in 1996. In 1997, following up on this appeal,

Keidanren produced the “Keidanren Voluntary Action Plan on the Environment,” a program in which 50 industries currently participate and deal vigorously not only with the problem of global warming but also with waste-related issues. The results of 5th follow-up indicated that CO2 emissions in fiscal 2001 were 483.70 million t-CO2, a 2.9% decrease compared to fiscal 1999 and a 3.2% decrease compared to fiscal 1990.

4) Recent survey results of Japanese companies’ environmental consideration

As for the recent environment behavior of the Japanese enterprise in the foreign countries, ministry of the environment carries out a questionnaire survey regularly.

In "the survey on environment friendly corporate activities in 2001",1,291 listed companies and 2,898 non-listed companies answered for questionnaire. Main findings from questionnaire are as follows (The figures in the parentheses show the answer of the non-listed Japanese companies.);

1) Environmental measures of business activities in developing countries; i) Japanese head quarter is providing environment-related information and environment technological support 39.4%(24.8%), ii) There are not special environment measures in business activities in developing countries 30.6%(39.5%), iii) There is a written corporate management policy or corporate environmental policy for environmental measures in foreign operation 26.1%(18.4%).
2) Disclosure of environmental measures in foreign operation in developing countries; 64.7% of listed Japanese companies answered “no disclosure of their environmental measures."(Non-listed Japanese companies are 74.8%. The figures in the parentheses hereafter show the answer of the non-listed Japanese companies.) 12.0 %(8.2%) of listed Japanese companies answered, " disclosure by the request." Only 15.4 %(4.4%) of listed Japanese companies answered they describe their environmental measures in the environment report. This figure shows that there is a tendency to disclose the environmental measures in foreign activities in their environment report in comparison with 2000 survey result. While Japanese companies’ activities become more global, the company has to disclose environmental measures in foreign operation as well as in Japan.
3) Environmental standards; 74.4 %(61.2%) of listed Japanese companies answered that they has taken local environmental standards. 7.1 %(3.4%) of Japanese

companies have taken environmental standard in Japan. Japanese standard is usually stricter than local standard.

4) The initiative for the environmental matters in the overseas operation (Items only indicated in the 2000 survey): 58.8 %(45.2%) of the answer shows that "the joint venture companies have the initiative of environmental matters." 32.3 %(38.6%) is replied that Japanese head quarter has initiatives for environmental matters. This answer shows that it is in the trend that environment consideration can be enforced in the local judgment.
5) Environmental problems in the operation (2000 survey); 82.9 %(88.8%) of listed Japanese companies answered that they have not experienced environmental problems in their operation. 11.5 %(7.5%) of companies have experienced minor environmental problems.
6) Environmental problems (2000 survey); water pollution issues is the highest for 58.3 %(45.5%), followed by disposal for 27.8 % (18.2 %).

Japanese companies became to put more consciousness for the environment measures in FDI in this decade. In the 1990s, the environmental laws and regulations are not so well arranged in developing countries, and also, the implementation of the laws and regulations are done arbitrarily. These situations reduced the mind for environment measures of multinational companies.

In the middle of 1990s, Japanese companies tried to develop their environmental mind in their foreign manufacturing activities by the leadership of Keidanren. Although the defects of environmental laws and regulations are indicated, Japanese companies made positively environmental measures and environmental assessments in the process of FDI, and also many Japanese companies had their own environmental management policy.

There still remain problems in the field of environmental infrastructure in developing countries. For instance, many companies have worries the treatment of industrial waste. The development of environmental infrastructure is anticipated the support of ODA.

In the 2000s, many Japanese companies are trying to provide environmental technical support and environmental information to the joint venture companies in developing countries. Nowadays, many Japanese companies specify their environmental management policy in the company philosophy.

3. Recent corporate activities' Impacts for environmental industry

Environment industry is a broad meaning and there are various definitions in it. In Japan, environmental Industries are defined as industrial sectors with a potential to help reduce environmental burdens.

In other words, it is the industry to offer following four areas services, 1) equipments to reduce environmental burdens, 2) environment friendly products, 3) services for environment protections, and 4) social environmental infrastructure.

Japan's ODA has been providing the assistance for developing countries in the area of 1) equipments to reduce environmental burdens, 2) services for environment protection, and 3) assistance for building social environmental infrastructure. And in the technical cooperation for developing countries, Japan is cooperating to reinforce environmental institution building of the government in the form of dispatching Japanese experts, accepting trainees from developing countries and providing of environmental equipments. These cooperation means that Japan has provided the equipments for environment preservation and techniques for operation of the equipments.

ODA is the cooperation for government to government, so it does not directly intend to develop private environmental industry. But the establishment of environmental policy and rules of the government in developing country is the key to develop the environmental mind and the environmental industry. The development of government attitude for environment will educate the company's environmental mind.

ODA will contribute construction for good infrastructure for environment and environmental mind of the government in developing countries.

Corporate activities will contribute more directly to reduce the environmental problems. It will be a role of multinational companies to lead their related local companies to the operation for environment friendly in developing countries. Nowadays, many Japanese companies are operating with environmental measures in Asian countries. These corporate attitudes will help to develop environmental minds in local companies.

Although many Japanese companies publish environmental report in these days, there

are very few to describe environmental matters in their foreign operation. In the survey in FY2001 of the ministry of environment, the companies which reported their environmental measures in overseas operations in environmental report don't pass 12%. But it increases the tendencies to report the situation of acquisition of ISO14001 at overseas office. In the time of globalization of corporate activities, the company has to disclose their environmental matters of overseas activities in the same way in the domestic.

The companies, which are more sensitive to the environmental matters, have a tendency to act positively to environmental matters in overseas operation and also report their environmental activities in the environmental report.

Following examples are introduction of recent corporate behavior of Japanese companies for environmental issues.

1) Toyota introduced "consolidated environmental management" at all consolidated subsidiaries in Japan and overseas, major production companies, and overseas distributors in FY2000. Consolidated environmental management covers a total of 600 companies. Toyota thus responds to environmental issues on a global scale by enhancing its environmental management system.
2) Honda disclosed data of energy consumption, CO2 emission and waste in Japan and overseas factories in environmental report.
3) NEC has been transferring production technology and know-how related environmental matters to overseas EMS (Electronic Manufacturing Services).
4) Sony introduced the green partner system to promote environmental considerations from the materials procurement stage in 2001. The Green Partner System involves coordinating Sony's efforts with those of business partners who supply components, devices and materials. The Green Partner Standards were established with the aim of taking green procurement to a higher level whereby the demand-side, the Sony Group, and the supply-side, the green partners, work in unison to preserve the environment. This system intends to introduce overseas Sony group.
5) Matsushita Electric group announced new idea for environment protection, namely "greening lighting service". Until now, manufacturers produces and sales their products, and consumer buy and dump out the products after used. In this idea, Matsushita retains the ownership of fluorescent lamps under contract with corporate user, and users buy the only usefulness of fluorescent lamps. So

Matsushita is responsible for collection of the products after the use for the global environment.

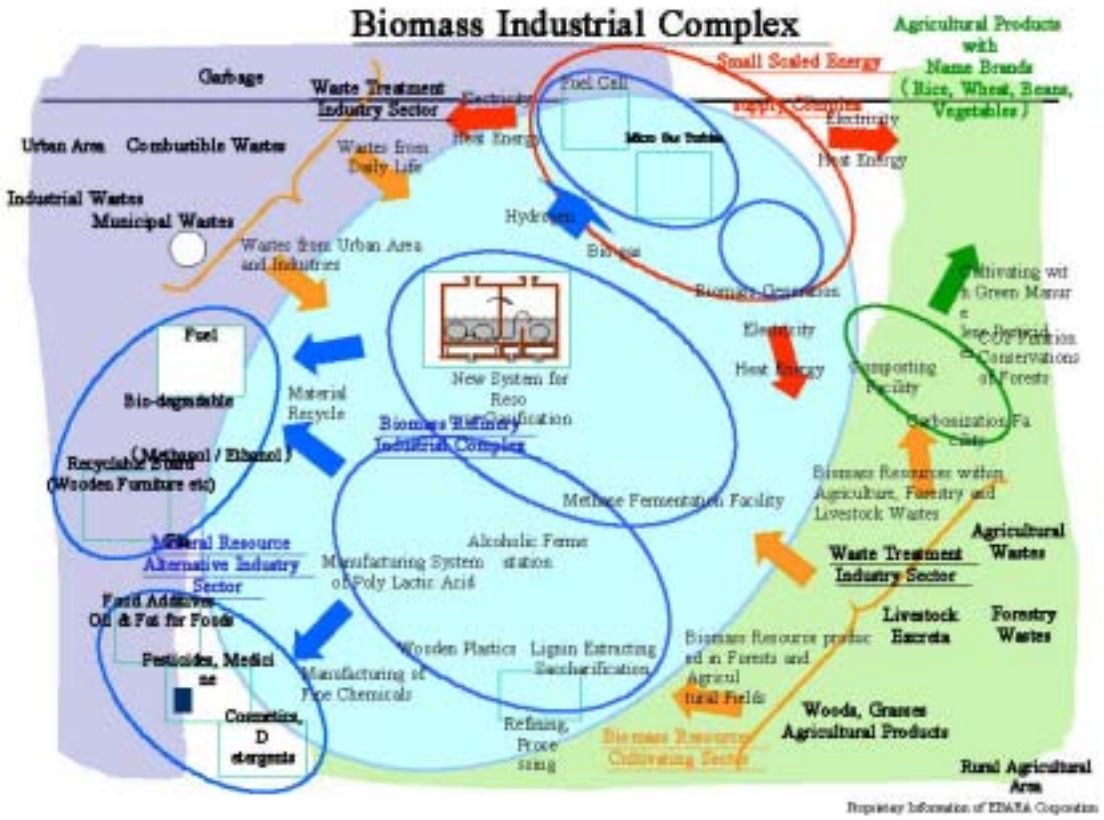
6) Japanese companies programs for CO2 emission: Many Japanese companies are trying to reduce CO2 emission in their operation and also some companies are trying to establish emissions trading in their companies group. Mitsubishi Electric, Asahi Breweries, Kirin Breweries, Sapporo Breweries and Suntory announce officially their target figures for reduction of CO2 emission. Matsushita establishes their in-house system for emissions trading and starts their emissions trading system on a trial basis. Ricoh Company is planning to establish CDM by aforestation up to 2010.

The above mentioned examples are recent Japanese companies' activities to improve environment issues. These corporate behaviors also improve subcontractors' attitude for environment. It seems that consciousness for the environment leads to set up the environmental industry market in developing countries.

Adding to the environmental measures of Japanese manufacturing companies, Japanese engineering companies are strengthening environment business activities. Ebara Corporation, one of Japanese contractor of environmental engineering systems, is focusing in their activities on the realization of the Zero Emission, which is a concept proposed by the United Nations University. Under the Zero Emission concept, EBARA is aiming to create a sustainable society by developing hardware and processes for new recycling, maintenance, and production systems. EBARA is trying to transform the one-way flow of resource consumption and waste into a sustainable circulating flow of resource in their environmental business.

EBARA is proposing to combine biomass and natural energy as future environmental business in developing countries. There is so much renewable biomass energy in Japan. It is equivalent to about 12% of annual primary energy consumption in Japan. The amount of stocks of the biomass energy in the world is presumed to be about 70 times of annual energy consumption of the world. It is expected that biomass energy production in a rural community achieves effective use of agricultural resources. EBARA is conceiving the idea of the biomass industrial complex to industrialize and develop biomass energy. This technology will be useful in developing countries. Also this will lead to further growth of environmental industry in the developing countries. EBARA's biomass industrial complex is shown in figure2.

Figure 2 Biomass Industrial Complex



The environmental consideration of Japanese multinational companies in developing countries will raise the environmental consciousness of local companies. Moreover, local companies will be able to develop their technology for the environment in their subcontract work of Japanese multinational companies. Japan's ODA offers the basic technology for the environment protection and raises the consciousness for environment in developing countries. And governments of developing countries will get the hands to secure the implementation of environmental restriction. And engineering companies will offer practical technology to protect environment issues. The combination of three actors will lead the development of environmental industry.

Reference

Imai, Shinichi, 2002, Trends in the greening of Japanese companies and the initiatives taken by Matsushita Electric, The Second Tripartite Roundtable on Environmental Industry(China, Korea and Japan), Awajishima, Hosted by Ministry of Environment and Hyogo Prefectural Government, Cooperated by Institute for Global Environmental Strategies(IGES)

Masui, Toshihiko, 2002, Economic effects of environmental investment and the role of environmental industry—estimation using environmental-economic model, The Second Tripartite Roundtable on Environmental Industry(China, Korea and Japan), Awajishima, Hosted by Ministry of Environment and Hyogo Prefectural Government, Cooperated by Institute for Global Environmental Strategies(IGES)

Miyakawa, Yutaka, 2002, Synopsis of "Current situation and future directions of the environmental business in Japan, The Second Tripartite Roundtable on Environmental Industry(China, Korea and Japan), Awajishima, Hosted by Ministry of Environment and Hyogo Prefectural Government, Cooperated by Institute for Global Environmental Strategies(IGES)

Ueki, Tsuneyuki, 2002, Ebara's zero emissions technology for biomass refinery, The Second Tripartite Roundtable on Environmental Industry(China, Korea and Japan), Awajishima, Hosted by Ministry of Environment and Hyogo Prefectural Government, Cooperated by Institute for Global Environmental Strategies(IGES)

Japan Overseas Enterprises Association, 1990, the research report of environmental management of Japanese multinational companies in ASEAN 5 countries (Indonesia, Malaysia, the Philippines, Singapore and Thailand) Tokyo.

---- 1991, the research report of environmental management of multinational companies in ASEAN 5 countries (Indonesia, Malaysia, the Philippines, Singapore and Thailand) Tokyo.

Global Environmental Forum, 1995, Trends in Environmental Considerations related to Overseas Activities of Japanese Companies Tokyo.
(URL: http://www.env.go.jp/earth/coop/oemjc/index.html)

Keidanren (Japan Federation of Economic Organizations), 1990, Ten-Points-Environmental Guidelines for the Japanese Enterprises Operating Abroad in Keidanren's Basic Views of the global environment problems, Tokyo

----, 1996, Declaration on Voluntary Action of Japanese Industry Directed at Conservation of Global Environment in the 21st Century, Tokyo

----, 1997, Keidanren Voluntary Action Plan on the Environment, Tokyo

URL of Keidanren (Nippon Keidanren : Japan Business Federation): http://www.keidanren.or.jp/english/policy/index07.html