A Project Consigned of the Environment Agency in 1996

Overseas Environmental Measures of Japanese Companies (Philippines)

- Research Report on Trends in Environmental Considerations related to Overseas Activities of Japanese Companies - FY 1996

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Global Environmental Forum

Preface

There are various reasons why so many Japanese enterprises have been making inroads into the Philippines in recent years: the Philippines has become an attractive new market due to its significant economic growth; export-related industries are treated favorably; English is one of the national languages; labor costs are low; and finally, other business acquaintances may already be doing business there.

In 1995, the Environment Agency conducted a survey on actual measures to protect the environment carried out by Japanese companies doing business in the Philippines and other Southeast Asian nations. One of the questions in the survey was, "What do you expect the Japanese government to do in order to improve the environmental measures taken by companies making inroads into foreign countries?" The most common answer was "To publish information (by drawing up manuals, etc.) on the environmental situation in individual countries." Direct interviews also revealed that there is a demand for manuals on environmental control, as well as on the present status of environmental problems and actual measures taken by leading companies.

We have therefore compiled information and examples of how Japanese companies have been tackling environmental problems as a project of the Environment Agency for 1996, with the cooperation of the Japanese Chamber of Commerce & Industry in the Philippines and many other parties.

This book includes the following: (1) The latest environmental controls in relation to prevention of water and air pollution; (2) Case studies of pioneering Japanese companies that are tackling pollution prevention; (3) The status of ISO 14001 which is now attracting much attention; (4) Examples of environmental management systems set up for ISO 14001; and (5) Matters to be considered when tackling environmental problems in the Philippines.

We hope this book will be of help both to Japanese companies already doing business in the Philippines to enable them to improve remedies for environmental problems and to those planning to enter the Philippines to enable them to address environmental problems in more appropriate ways.

We express our very great appreciation for the generous support of the Japanese Chamber of Commerce & Industry in the Philippines in compiling this book and for the cooperation provided by Japanese companies and government agencies in the Philippines.

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■Structure and Use of This Book

The structure of this book is as follows. Each chapter is independent, and so readers can start from any chapter according to the needs of individual companies.

Chapter 1 outlines the latest information on environmental problems and their legislative control in the Philippines today.

Chapter 2 introduces specific cases relating to waste water treatment in consideration of environmental control. Information was collected by carrying out on-site inquiries at Japanese companies in the Philippines.

Chapter 3 introduces the case of a company that reduced the burden on the environment by improving its manufacturing process, using a so-called clean technology that has attracted much attention. This technology differs significantly from so-called "end-of-pipe" measures to prevent pollution.

Chapter 4 introduces other cases of companies that are concerned about the environment that have contributed to society through their products.

Chapter 5 introduces cases of environmental management systems built in accordance with ISO 14001: Environmental Management System Standard, issued by the International Organization for Standardization (ISO) in September 1996.

Chapter 6 describes special circumstances and difficulties experienced by Japanese companies that have tackled environmental problems in the Philippines. The problems, etc. are discussed by those people who are actually addressing the problems. This chapter should help companies to tackle environmental problems, which may be difficult to do based only on examples.

The following have been added in the Appendix:

- Sources of environmental information in the Philippines and Japan
- Environment-related legislation in the Philippines
- Current status of environmental policies of Japanese companies in Asia, including the Philippines
- Background explanation of global environmental issues that should be understood when dealing with environmental problems
- Outline of an Environmental Management System

For reference, 1 Philippine peso is equivalent to about 5 yen (as of March 1997).

(List of Abbreviations)
DENR: Department of Environment and Natural Resources
EMB: Environmental Management Bureau
NPCC: National Pollution Control Commission
LLDA: Laguna Lake Development Authority
EIS: Environmental Impact Statement

Contents

Chapter 1: Environmental Problems and Their Legislative Control in the Philippines Today

This chapter describes the latest information about environmental problems and their legislative control in the Philippines today. Specifically, it covers regulatory values for water and air pollution, and explains the "Environmental Users Fee System" in the Laguna Lake area, which has been reported in the newspapers, and so on. For the provisions of environment-related legislation, refer to Appendix 2.

1. Outline of the Philippines

Situated southwest of Japan, the Philippines is a constitutional republic comprising about 7,000 islands including Luzon, the main island, Mindanao, Samar, Negros, Panay and Palawan. The Philippines has a long history of exchanges with Japan. Since it takes only about three and a half hours by air from Japan to the Philippines today, the country attracts many tourists and companies from Japan.

The total area of the Philippines is about 300,000 square km with a population of approximately 70 million. The principal people are Malays, which are divided into Visayans, Tagalogs and several dozen other ethnic groups. More than 80 languages are spoken in the country. The official languages are Pilipino and English. Among Southeast Asian countries, the Philippines is one of only a few nations where English is spoken by people in daily life. Most of the people are devout Roman Catholics. The capital of the Philippines is Metropolitan Manila.

Figure 1-1 Rough Map of the Philippines

2. Government Environmental Policies and Organization

Because various government departments were separately responsible, government environmental policies in the Philippines could not be described as "integrated." However, the new constitution was adopted in 1986, environmental administrative bodies were reformed in accordance with Executive Order No. 192 in the following year. The Department of Environment and National Resources (DENR) took charge of all environmental administration. The DENR is a body that has the integrated and strengthened authority of the former Department of Natural Resources and the Ministry of House Settlements. Its task is to make policy decisions on environment and natural resources and to balance development activities with environmental management, with the aim to achieve sustainable development.

The DENR consists of 8 staff offices, 6 staff bureaus, 4 attached agencies and 13 regional offices in the administrative districts.

The 8 staff offices are: the Special Concerns Office, Public Affairs Office, Planning and Policy Studies Office, Foreign-Assisted and Special Projects Office, Field Operations Office, Management Services Office, Legislative Affairs Office and Legal Affairs Office. The 6 staff bureaus are: Forest Management Bureau, Mines and Geosciences Bureau, Environmental Management Bureau, Ecosystems Research and Development Bureau, Protected Areas and Wildlife Bureau and Lands Management Bureau. The attached 4 agencies are: Pollution Adjudication Board, National Mapping and Resource Information Authority, Natural Resources Development Corporation and National Electrification Bureau.

The total number of staff at the DENR today is about 35,000. About 5,000 are assigned to the headquarters, and the remaining 30,000 work at the regional offices. About 7,000 of the regional office staff are forest rangers.

Within the DENR is the newly established Environmental Management Bureau (EMB) with jurisdiction over environmental management, pollution prevention, and environmental assessment, established on the Executive Order No. 192, which took over the responsibilities of the Environment Center of the Philippines, the National Pollution Control Commission, and the National Environment Protection Council. It administers control over air and water quality and conducts environmental assessments as well as coordinates with other governmental bodies. The EMB consists of four divisions, the Legal Division, Research & Development Division, Environmental Quality Division and Environmental Education Division, as well as sections under direct control of the director of the bureau, such as the Administrative Division, Management and Financial Affairs Division, Secretariat and the like. The number of full-time staff is about 170.

Of special significance among the other environmental ministries and departments is the Laguna Lake Development Authority (LLDA). The LLDA is an environmental policy implementation body with jurisdiction over development and the environment in the Laguna Lake region southeast of the capital, Manila. All applications with regard to development activities in the Laguna Lake area must go through LLDA.

The DENR issued "The Philippine Environmental Quality Report, 1990-1995" in November 1996, which described the environmental situation and environmental policies of the government in the Philippines for the six years from 1990 through 1995. This was the first publication of the DENR as an environmental white paper and is expected to be published continuously in the future.

3. Overview of Environmental Legislation

As with other Southeast Asian nations, the Philippines is experiencing rapid population growth in its cities. The air is being polluted in the metropolitan area around Manila, rivers and inland waters in urban areas are suffering water pollution, waste products are increasing in volume and creating environmental pollution resulting from their disposal, and natural environments are increasingly under threat. These are the environmental problems the country is confronting and their resolution is a pressing task.

Legislation equivalent to the Philippines Basic Environment Law which deals with environmental issues in general are the Presidential Decree 1151: the Philippine Environmental Policy, and the Presidential Decree 1152, the Philippine Environmental Code, both adopted under the Marcos regime in 1977. However, these environmental laws had shortcomings: for example, multiple executive bodies were designated to be in charge of one specific problem, creating reduplication and necessitating coordination among bodies concerned. Also, shortage of personnel, equipment, and financial resources meant difficulty in implementing these laws.

Under the administration of President Aquino, who took office in 1986, a new constitution was adopted and environmental rights became part of constitutional rights. In this regard, the basic principles enshrined in the Presidential Decrees 1151 and 1152 were upheld. With respect to the environmental administrative system, the DENR was put in sole charge, and the environmental laws are now undergoing review in the form of legislation being passed through the national assembly, with many bills having been presented and debated since 1992. Some bills are equivalent to a new Basic Environment Law, but have not yet been passed because in the national assembly, the group giving priority to development and economic growth holds a majority over the group giving priority to environment preservation, according to a responsible persons at the DENR.

The bills presented to the national assembly are said to contain higher monetary penalties and incentives under which companies that more than satisfy environmental criteria will be exempt from some taxes. This should improve the present situation, under which those who do not satisfy the criteria and pay the penalties enjoy an economic advantage.

Because bills for amending environmental laws have not yet been passed to respond to the actual state of the environment today, the DENR has reviewed the former environment standards and emission standards and is promulgating urgent items in the form of administrative decrees without approval from the legislature.

Presidential Decree 1151 lays down the national environmental policies, national environmental targets, the right to enjoy a healthy environment, guideline for the Environmental Impact Statement (EIS), and guidelines for implementation bodies. Of interest to private corporations among these is the guideline relating to EIS. When engaging in activities and projects that is bound to have a major impact on the environment, all organizations, including government organizations and private enterprises, are required to draw up and submit an EIS. Presidential Decree 1152, which follows on in the policy principles of PD 1151, stipulates the management system to be adopted in the five areas of air quality, water quality, land use, natural resources, and waste products.

The following is a summary of the ongoing situation with regard to the three problems of water pollution, air pollution, and waste products, which are the main environmental areas affected especially by the activities of corporations, and the legislative measures that are being taken to control them.

4. Countermeasures against Water Pollution

1) The Present Situation of Water Pollution

Water pollution of rivers and lakes in the Philippines is now in a very serious state, especially in the Manila metropolitan area, where the major rivers are heavily polluted with industrial and domestic effluent, agricultural chemicals included in agricultural effluent, heavy metals, and other toxic substances.

The Laguna Lake, located to the south of Manila, is now at crisis point, because of pollution caused by effluent from surrounding factories. Pollution in Laguna Lake consists of 40 percent agricultural effluents, 30 percent industrial effluents and 30 percent domestic effluents. An LLDA survey shows that 700 factories (equivalent to 47 percent of about 1,500 factories around the Lake) have waste water treatment equipment, but waste water from such equipment is still thought to contribute significantly to water pollution in Laguna Lake. As for domestic effluents, approximately 60 percent of the 8.4 million people living in the surrounding area discharge unprocessed waste water and garbage straight into Laguna Lake.

Meanwhile, in rural areas, water quality is deteriorating due to agricultural chemicals, chemical fertilizers, effluent from mining operations, and waste water flowing in from wider areas because of such problems as deforestation. Marine pollution has also dramatically worsened over the past decade, owing to dumping of untreated water, industrial effluent, waste water from mining, oil spills from shipping, soil erosion because of deforestation and agriculture.

In order to prevent such pollution of rivers, lakes and the sea and in order to improve water quality, effluent standards must be tightened, but it is also important to make companies and others concerned to adhere strictly to effluent standards and regulations which are in force. Moreover, improvements must be made in sewerage and waste disposal and changes must be made in the national lifestyle so that domestic effluent can

also be put under control.

2) Overview of Legislative Controls Relating to Countermeasures against Water Pollution

The latest legislation relating to countermeasures against water pollution, which has been amended many times, is the DENR Administrative Order No. 34, Series of 1990, "Revised Water Usage and Classification/Water Quality Criteria Amending Section Nos.: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations" and the DENR Administrative Order No. 35, Series of 1990, "Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982," which were promulgated on March 20, 1990.

DENR Administrative Order No. 34 divides water usage into: 1) fresh waters such as rivers, lakes and reservoirs, and 2) coastal waters and sea areas. Fresh waters are classified into five categories, Class AA, A, B, C and D. Coastal waters and sea areas are classified into four categories, Class SA, SB, SC and SD. The Order sets water quality criteria for organic pollutants, etc. for each category. Figures 1-2 through 1-6 show the criteria.

The DENR Administrative Order No. 35 lays down the maximum figures for effluent criteria relating to harmful materials and other severe poisons for the protection of public hygiene. The criteria are classified into five categories: protected waters I (class AA and SA), protected waters II (class A, B and SB), fresh waters class C, sea class SC and sea class SD. Each category is divided between existing facilities and new facilities. Similarly, the Order lays down maximum figures for effluent criteria relating to general and other pollutants, which are classified into six categories: protected waters I, protected waters II, fresh waters class C, fresh waters class D, sea class SC, sea class SD and other unclassified waters. Each category is divided between existing facilities and new facilities. Figures 1-7 and 1-8 show the criteria figures.

Factories and plants operating in the Philippines are required to satisfy these effluent criteria and to ascertain which effluent criterion apply to their facilities in accordance with the classifications, such as fresh waters, etc., laid down by the DENR.

As shown in Figure 1-9, BOD effluent criteria figures were put into force in January 1995. The BOD effluent criteria figures are applied to factory effluents with a BOD value for unprocessed effluent that exceeds 3,000 mg/l. Therefore the criteria are applied to the relevant factories. The prescribed official analysis method is shown in the DENR Administrative Order Nos.34 and 35.

Figure 1-2 Water Usage and Classification

(1) Fresh Surface Waters (rivers, lakes, reservoirs, etc.)

Classification	Beneficial Use
Class AA	Public Water Supply Class I. This class is intended primarily for waters having watersheds which are uninhabited and otherwise protected and which require only approved disinfection in order to meet the National Standards for Drinking Water (NSDW) of the Philippines.
Class A	Public Water Supply Class II. For sources of water supply that will require complete treatment (coagulation, sedimentation, filtration and disinfection) in order to meet the NSDW.
Class B	Recreational Water Class I. For primary contact recreation such as bathing, swimming, skin diving, etc. (particularly those designated for tourism purposes).
Class C	1) Fishery Water for the propagation and growth of fish and other aquatic resources; 2) Recreational Water Class II (Boating, etc.) 3) Industrial Water Supply Class I (For manufacturing processes after treatment).
Class D	1) For agriculture, irrigation, livestock watering, etc. 2) Industrial Water Supply Class II (e.g. cooling, etc.); 3) Other inland waters, by their quality, belong to this classification.

(2) Coastal and Marine Waters

Classification	Beneficial Use
Class SA	1) Waters suitable for the propagation, survival and harvesting of shellfish for commercial purposes; 2) Tourist zones and national marine parks and reserves established under Presidential Proclamation No. 1801; existing laws and/or declared as such by appropriate government agency. 3) Coral reef parks and reserves designated by law and concerned authorities.
Class SB	1) Recreational Water Class I (Areas regularly used by the public for bathing, swimming, skin diving, etc.); 2) Fishery Water Class I (Spawning areas for Chanos chanos or “Bangus” and similar species).
Class SC	1) Recreational Water Class II (e.g. boating, etc.); 2) Fishery Water Class II (Commercial and sustenance fishing); 3) Marshy and/or mangrove areas declared as fish and wildlife sanctuaries;
Class SD	1) Industrial Water Supply Class II (e.g. cooling, etc.); 2) Other coastal and marine waters, by their quality, belong to this classification.

DENR Administrative Order No.34 , Series of 1990; Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

Note for Figures 1-3 ~ 1-6.

(a) Except as otherwise indicated, the numerical limits in Figures 1-3 and 1-5 are yearly average values. Values enclosed in parentheses are maximum values.

(b) For irrigation purposes, SAR should have a minimum value of 8 and a maximum value not to exceed 18. Boron should not exceed 0.75 mg/L.

(c) No abnormal discoloration from unnatural causes

(d) The allowable temperature increase over the average ambient temperature for each month. This rise shall be based on the average of the maximum daily temperature readings recorded at the site but upstream of the mixing zone over a period of one (1) month.

(e) Sampling taken between 9:00 AM and 4:00 PM

(f) Not more than 30% increase

(g) Not more than 30 mg/L increase

(h) Not more than 60 mg/L increase

(i) Do not apply if natural background is higher in concentration. The latter will prevail and will be used as baseline.

(j) Applicable only to lakes, reservoirs, and similarly impounded water.

(k) When applied to lakes or reservoirs, the Phosphate as P, concentration should not exceed an average of 0.05 mg/L nor a maximum of 0.1 mg/L.

(l) Not present in concentrations to affect fish flavor/taste.

(m) These values refer to the geometric mean of the most probable number of coliform organism daring a 3-month period and that the limit indicated shall not be exceeded in 20 percent of the samples taken during the same period.

(n) For spawning areas for Chanoschanos and other similar species

(o) Limit is in terms of dissolved copper

nil Extremely low concentration and not detectable by existing equipment

-- Means the standard of these substances are not considered necessary for the present time, considering the stage of the country's development and DENR capabilities, equipment and resources.

nr Means No Recommendation made

Figure 1-3 Water Quality Criteria for Conventional and Other Pollutants Contributing to Aesthetics and Oxygen Demand for Fresh Waters [a]

PARAMETER	UNIT	CLASS AA	CLASS A	CLASS B	CLASS C	CLASS D[b]
Color	PCU	15	50	(c)	(c)	(c)
Temperature[d] (max. rise in deg. Celsius)	°C rise	--	3	3	3	3
pH (range)		6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.0-9.0
Dissolved Oxygen[c] (Minimum)	% satn	70	70	70	60	40
	mg/L	5.0	5.0	5.0	5.0	3.0
5-Day 20°C BOD	mg/L	1	5	5	7(10)	10(15)
Total Suspended Solids	mg/L	25	50	(f)	(g)	(h)
Total Dissolved Solids	mg/L	500[i]	1,000[i]	--	--	1,000[i]
Surfactants (MBAS)	mg/L	nil	0.2(0.5)	0.3(0.5)	0.5	--
Oil Grease (Petroleum Ether Extract)	mg/L	nil	1	1	2	5
Nitrate as Nitrogen	mg/L	1.0	10	nr	10[i]	--
Phosphate as Phosphorus	mg/L	nil	0.1[k]	0.2[k]	0.4[k]	--
Phenolic Substances as Phenols	mg/L	nil	0.002	0.005[l]	0.02[l]	--
Total Coliforms	MPN/ 100mL	50[m]	1,000[m]	1,000[m]	5,000[m]	--
or Fecal Coliforms	MPN/ 100mL	20[m]	100[m]	200[m]	--	--
Chloride as Cl	mg/L	250	250	--	350	--
Copper	mg/L	1.0	1.0	--	0.05[o]	--

DENR Administrative Order No.34 , Series of 1990;Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

Figure 1-4 Water Quality Criteria for Toxic and Other Deleterious Substances for Fresh Waters (For the Protection of Public Health)

PARAMETER	UNIT	CLASS AA	CLASS A	CLASS B	CLASS C	CLASS D
Arsenic(i)	mg/L	0.05	0.05	0.05	0.05	0.1
Cadmium(i)	mg/L	0.01	0.01	0.01	0.01	0.05
Chromium(i) (hexavalent)	mg/L	0.05	0.05	0.05	0.05	0.1
Cyanide	mg/L	0.05	0.05	0.05	0.05	--
Lead(i)	mg/L	0.05	0.05	0.05	0.05	0.5
Total Mercury(i)	mg/L	0.002	0.002	0.002	0.002	0.002
Organophosphate	mg/L	nil	nil	nil	nil	nil
Aldrin	mg/L	0.001	0.001	--	--	--
DDT	mg/L	0.05	0.05	--	--	--
Dieldrin	mg/L	0.001	0.001	--	--	--
Heptachlor	mg/L	nil	nil	--	--	--
Lindane	mg/L	0.004	0.004	--	--	--
Toxaphane	mg/L	0.005	0.005	--	--	--
Methoxychlor	mg/L	0.10	0.10	--	--	--
Chlordane	mg/L	0.003	0.003	--	--	--
Endrin	mg/L	nil	nil	--	--	--
PCB	mg/L	0.001	0.001	--	--	--

Note: 1 Limiting value of organophosphates and organochlorines may in the meantime serve as guidelines in the interim period pending the procurement and availability of necessary laboratory equipment. For Barium, Cobalt, Fluoride, Iron, Lithium, Manganese, Nickel, Selenium, Silver and Vanadium, the 1978 NPCC Rules and Regulations, Section 69 may be considered.

DENR Administrative Order No.34 , Series of 1990;Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

Figure 1-5 Water Quality Criteria for Conventional and Other Pollutants Affecting Aesthetics and Exerting Oxygen Demand for Coastal and Marine Waters.[a]

PARAMETER	UNIT	CLASS SA	CLASS SB	CLASS SC	CLASS SD
Color	PCU	(c)	(c)	(c)	(c)
Temperature[d] (max. rise in deg. Celsius)	°C rise	3	3	3	3
pH (range)		6.5-8.5	6.0-8.5	6.0-8.5	6.0-9.0
Dissolved Oxygen[e] (Minimum)	% satn	70	70	70	50
	mg/L	5.0	5.0	5.0	2.0
5-Day 20°C BOD	mg/L	3	5	7(10)	--
Total Suspended Solids	mg/L	(f)	(g)	(g)	(h)
Surfactants (MBAS)	mg/L	0.2	0.3	0.5	--
Oil Grease (Petroleum Ether Extract)	mg/L	1	2	3	5
Phenolic Substances as Phenols	mg/L	nil	0.01	(l)	--
Total Coliforms	MPN/ 100mL	70[m]	1,000[m]	5,000[m]	--
Fecal Coliforms	MPN/ 100mL	nil	200[m]	--	--
Copper	mg/L	--	0.02[n][o]	0.05[o]	--

DENR Administrative Order No.34 , Series of 1990;Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990 *)*

Figure 1-6 Water Quality Criteria for Toxic and Other Deleterious Substances for Coastal and Marine Waters (For the Protection of Public Health)

PARAMETER	UNIT	CLASS SA	CLASS SB	CLASS SC	CLASS SD
Arsenic (i)	mg/L	0.05	0.05	0.05	--
Cadmium (i)	mg/L	0.01	0.01	0.01	--
Chromium (i) (hexavalent)	mg/L	0.05	0.1	0.1	--
Cyanide	mg/L	0.05	0.05	0.05	--
Lead (i)	mg/L	0.05	0.05	0.05	--
Total Mercury(i)	mg/L	0.002	0.002	0.002	--
Organophosphate	mg/L	nil	nil	nil	--
Aldrin	mg/L	0.001	--	--	--
DDT	mg/L	0.05	--	--	--
Dieldrin	mg/L	0.001	--	--	--
Heptachlor	mg/L	nil	--	--	--
Lindane	mg/L	0.004	--	--	--
Toxaphane	mg/L	0.005	--	--	--
Methoxychlor	mg/L	0.10	--	--	--
Chlordane	mg/L	0.003	--	--	--
Endrin	mg/L	nil	--	--	--
PCB	mg/L	0.001	--	--	--

Note: 1 Limiting values of organophosphates and organochlorines may in the meantime serve as guidelines in the interim period pending the procurement and availability of necessary laboratory equipment. For Barium, Cobalt, Fluoride, Iron, Lithium, Manganese, Nickel, Selenium, Silver and Vanadium, the 1978 NPCC Rules and Regulations, Section 69 may be considered.

DENR Administrative Order No.34 , Series of 1990; Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

Figure 1-7 Effluent Standards: Toxic and Other Deleterious Substance (Maximum Limits for the Protection of Public Health)[a]

Parameter	Unit	Protected Waters Category I (Class AA & SA)		Protected Waters Category II (Class A, B, & SB)		Inland Waters Class C		Marine Waters Class SC		Marine Waters Class SD	
		OEI	NPI	OEI	NPI	OEI	NPI	OEI	NPI	OEI	NPI
Arsenic	mg/L	(b)	(b)	0.2	0.1	0.5	0.2	1.0	0.5	1.0	0.5
Cadmium	mg/L	(b)	(b)	0.05	0.02	0.1	0.05	0.2	0.1	0.5	0.2
Chromium (hexavalent)	mg/L	(b)	(b)	0.1	0.05	0.2	0.1	0.5	0.2	1.0	0.5
Cyanide	mg/L	(b)	(b)	0.2	0.1	0.3	0.2	0.5	0.2	--	--
Lead	mg/L	(b)	(b)	0.2	0.1	0.5	0.3	1.0	0.5	--	--
Mercury (Tot.)	mg/L	(b)	(b)	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.01
PCB	mg/L	(b)	(b)	0.003	0.003	0.003	0.003	0.003	0.003	--	--
Formal-dehyde	mg/L	(b)	(b)	2.0	1.0	2.0	1.0	2.0	1.0	--	--

NOTE:

(a) Except as otherwise indicated, all limiting values are maximum and shall not be exceeded.

(b) Discharge of sewage and/or trade effluents are prohibited or not allowed.

DENR Administrative Order No. 35, Series of 1990; Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982 (EMB/DENR, March 20 1990)

Figure 1-8 Effluent Standards: Conventional and Other Pollutants [a]

Parameter	Unit	Protected Waters				Inland Waters Class C	
		Category I (Class AA & SA)		Category II (Class A, B, & SB)			
		OEI	NPI	OEI	NPI	OEI	NPI
Color	PCU	(b)	(b)	150	100	200[c]	150[c]
Temperature (max. rise in degree Celsius in RBW)	°C rise	(b)	(b)	3	3	3	3
pH (range)		(b)	(b)	6.0-9.0	6.0-9.0	6.0-9.0	6.5-9.0
COD	mg/L	(b)	(b)	100	60	150	100
Settleable Solids (1-hour)	mg/L	(b)	(b)	0.3	0.3	0.5	0.5
5-Day 20°C BOD	mg/L	(b)	(b)	50	30	80	50
Total Suspended Solids	mg/L	(b)	(b)	70	50	90	70
Total Dissolved Solids	mg/L	(b)	(b)	1,200	1,000	--	--
Surfactants (MBAS)	mg/L	(b)	(b)	5.0	2.0	7.0	5.0
Oil Grease (Petroleum Ether Extract)	mg/L	(b)	(b)	5.0	5.0	10.0	5.0
Phenolic Substances as Phenols	mg/L	(b)	(b)	0.1	0.05	0.5	0.1
Total Coliforms	MPN/ 100mL	(b)	(b)	5,000	3,000	15,000	10,000

Parameter	Unit	Inland Waters (Class D)		Coastal Waters (Class SC)		Class SD & Other Coastal Waters Not Classified	
		OEI	NPI	OEI	NPI	OEI	NPI
Color	PCU	--	--	(c)	(c)	(c)	(c)
Temperature (max. rise in degree Celsius in RBW)	°C rise	3	3	3	3	3	3
pH (range)		5.0-9.0	6.0-9.0	6.0-9.0	6.0-9.0	5.0-9.0	5.0-9.0
COD	mg/L	250	200	250	200	300	200
5-Day 20°C BOD	mg/L	150[d]	120	120[d]	100	150[d]	120
Total Suspended Solids	mg/L	200	150	200	150	(g)	(f)
Total Dissolved Solids	mg/L	2,000[h]	1,500[h]	--	--	--	--
Surfactants (MBAS)	mg/L	--	--	15	10	--	--
Oil / Grease (Petroleum Ether Extract)	mg/L	--	--	15	10	15	15
Phenolic Substances as Phenols	mg/L	--	--	1.0(i)	0.5(i)	5.0	1.0
Total Coliforms	MPN/ 100mL	(j)	(j)	--	--	--	--

NOTE

1. In cases where the background level of Total Dissolved Solids (TDS) in freshwater rivers, lakes, reservoirs and similar bodies of water is higher than the Water Quality Criteria, the discharge should not increase the level of TDS in the receiving body of water by more than ten percent of the background level.
2. The COD limits generally apply to domestic wastewater treatment plant effluent. For industrial discharges, the effluent standards for COD should be on a case to case basis considering the COD-BOD ratio after treatment. In the interim period that this ratio is not yet established by each discharger, the BOD requirement shall be enforced.
3. There are no effluent standards for chloride except for industries using brine and discharging into inland waters, in which case the chloride content should not exceed 500 mg/L.
4. The effluent standards apply to industrial manufacturing plants and municipal treatment plant discharging more than thirty (30) cubic meters per day.

(a) - Except as otherwise indicated, all limiting values are 90th percentile values. This is applicable only when the discharger undertakes daily monitoring of its effluent quality, otherwise, the numerical values in the tables represent maximum values not to be exceeded once a year.
(b) - Discharge of sewage and/or trade effluents is prohibited or not allowed.
(c) - Discharge shall not cause abnormal discoloration in the receiving waters outside of the mixing zone.
(d) - For wastewaters with initial BOD concentration over 1,000 mg/L but less than 3,000 mg/L, the limit may be exceeded up to a maximum of 200 mg/L or a treatment reduction of ninety (90) percent, whichever is more strict. Applicable to both old and new industries.
(e) - The parameters Total Suspended Solids (TSS) should not increase the TSS of the receiving water by more than thirty (30) percent during the dry season.
(f) - Not more than 30 mg/L increase (dry season)
(g) - Not more than 60 mg/L increase (dry season)
(h) - If effluent is the sole source of supply for irrigation, the maximum limits are 1,500 mg/L and 1,000 mg/L, respectively, for old industries and new industries.
(i) - Not present in concentration to affect fish flavor or taste or tainting
(j) - If effluent is used to irrigate vegetable and fruit crops which may be eaten raw, Fecal Coliforms should be less than 500 MPN/100mL.

DENR Administrative Order No. 35, Series of 1990; Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982 (EMB/DENR, March 20 1990)

Figure 1-9 Effluent Standards for New Industries Producing Strong Wastes upon Effectivity of these Regulations, and for All Industries Producing Strong Wastes starting January 1, 1995.

Industry Classification Based on BOD of Raw Wastewater	Maximum Allowable Limits in mg/L Based on Receiving Body of Water	
	Inland Waters (Class C and D)	Coastal Waters (Class SC and SD)
1. Industries producing within 3,000 to 10,000 mg BOD/L	130 or 98% removal	200 or 97% removal
2. Industries producing within 10,000 to 30,000 mg BOD/L	200 or 99% removal	600 or 97% removal
3. Industries producing more than 30,000 mg BOD/L	300 or 99% removal	900 or 97% removal

Note: Including old or existing industries producing strong waste whose wastewater treatment plants are still to be constructed.

1. Use either numerical limits or percentage removal whichever is lower (or whichever is more strict).
2. For parameters other than BOD and COD Figure 1-8 Effluent Standards: Conventional and Other Pollutants shall apply.

DENR Administrative Order No. 35, Series of 1990; Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982 (EMB/DENR, March 20 1990)

Figure 1-10 Approved Methods of Analysis

PARAMETER	METHOD OF ANALYSIS
ARSENIC	Silver Diethyldithiocarbamate Method (Colorimetric)
BOD	Azide Modification (Dilution Technique)
BORON	Carmine Method (Colorimetric Method)
CADMIUM	Atomic Absorption Spectrophotometry (Wet ashing with concentration HNO_3+HCl)
CHLORINATED HYDROCARBONS	Gas Chromatography (ECD)
CHROMIUM (Hexavalent)	Diphenyl Carbazide Colorimetric Method
COLOR	Visual Comparison Method (Platinum Cobalt Scal)
CYANIDE	Specific Ion Electrode Method
DISSOLVED OXYGEN	Azide Modification (Winkler Method), Membrane Electrode (DO meter)
FECAL COLIFORMS	Multiple-Tube Fermentation Technique or Membrane Filter
LEAD	Atomic Absorption Spectrophotometry
NITRATE AS NITROGEN	Bruccine Method for Saline Waters, specific Ion Electrode Meter for Fresh Water
OIL AND GREASE	Gravimetric Method (Petroleum Ether Extraction)
ORGANO PHOSPORUS COMPOUNDS	Gas Chromatography (FPD)
PCB	Gas Chromatography (ECD)
pH	Glass Electrode Method
PHENOLIC SUBSTANCES	Chloroform Extraction Method
PHOSPHATE AS PHOSPORUS	Stannous Chloride Method
SETTLEABLE SOLIDS	Imhoff Cone Method
SURFACTANT (MBAS)	Methylene Blue Method (Colorimetric)
TEMPERATURE	Use of Mercury-Filled Thermometer
TOTAL COLIFORMS	Multiple-Tube Fermentation Technique or Membrane Filter
TOTAL MERCURY	Cold Vapor Technique, (Mercury Analyzer, AAS)
TOTAL SUSPENDED SOLIDS	Gravimetric Method

NOTE: Other methods found in the Philippine Standard Methods for Air and Water Analysis, the "Standard Methods for the Examination of Water and Waste Waters," published jointly by American Public Health Association, the American Waterworks Association and the Water Pollution Control Federation of the U.S. or in accordance with such other method of analyses as the DENR may prescribe.

DENR Administrative Order No.34, Series of 1990;Revised Water Usage and Classification / Water Quality Criteria Amending Section Nos: 68 and 69, Chapter III of the 1978 NPCC Rules and Regulations Criteria of Water Use Regulation (EMB/DENR, March 20 1990)

DENR Administrative Order No. 35, Series of 1990; Revised Effluent Regulations of 1990, Revising and Amending the Effluent Regulations of 1982 (EMB/DENR, March 20 1990)

3) Environmental Users Fee System

Furthermore, since January 1997 a new countermeasure has been implemented in the Laguna Lake area, which is suffering serious water pollution caused by factory effluents, according to PD984, Section 6, item g (Pollution Control Law) and Executive Order No. 927 "Defining Certain Powers and Functions of the Laguna Lake Development Authority (LLDA)." This is a system of collecting "Environmental Users Fees" (pollution charges) in proportion to the burden on the environment.

PD 984 invests the DENR (then the NPCC) with "the authority to issue, renew or deny permits under such conditions as it may deem reasonable for the prevention and abatement of pollution for the discharge of sewage, industrial waste --- and impose reasonable fees and charges for the issuance or renewal of all permits herein required." The Executive Order No. 927 invests the LLDA with the authority "to collect fees for the use of the lake waters and its tributaries for all beneficial purposes including but not limited to fisheries and waste disposal purpose, --- the share of the LLDA shall form part of its corporate funds and shall not be remitted to the National Treasury." The sanction system has not changed. Under the new system, however, the previous "Authority to Construct" and "Permit to Operate" have been replaced by the "Permit to Discharge," which is based on the existing water and air quality standards to be renewed annually.

A brochure issued by the LLDA describes that "to ensure that the rapid economic growth of the country is environmentally sustainable, it is important to make environmental management efforts more effective. In this context, DENR plans to introduce a system of environmental users fee to complement its existing regulatory framework. Under the proposed system, in addition to meeting the existing discharge standards specified in the regulations, activities that utilize environmental resources would also be required to pay a fee for every unit of pollution they discharge. This would help the Government achieve its objectives of preserving the environment in a reliable and cost-effective manner."

This Environmental Users Fee system is expected to be applied not only to the area around Laguna Lake but also eventually to all polluting activities from industrial, commercial, domestic and agricultural sources in the country.

However, in the first year of introduction, the system is being applied to about 120 industrial sources discharging waste water into Laguna Lake, which is under the jurisdiction of the LLDA, based on BOD (Biochemical Oxygen Demand). These 120 factories contributes 90 percent of the total water pollution discharged into Laguna Lake by industries. These 120 factories would be selected from the following five industrial sectors:

- Food processing
- Piggeries / Slaughterhouse
- Beverages
- Dyes and textiles
- Paper and pulp

The fees consist of a fixed and a variable fee components for BOD concentration. The fixed charge covers the cost of processing the discharge permit, monitoring and

evaluation.

Total annual environmental users fee = Fixed fee + Variable fee
<Fixed fee>

- Waste water discharges greater than 150 m^3/day: 15,000 Philippine pesos
- Waste water discharges between 31 and 150 m^3/day: 10,000 Philippine pesos
- Waste water discharges 30 m^3/day or less: 5,000 Philippine pesos

<Variable fee>

- Total BOD concentration is 50 mg/l or less: 5 Philippine pesos per kg of total BOD
- Total BOD concentration is greater than 50 mg/l: 30 Philippine pesos per kg of total BOD

Total annual BOD (in kilogram)
= (Average BOD concentration (mg/l)) × (daily Amount of waste water (m^3/day)) × 300 (number of annual operating days) × 10^{-3} (Conversion factor (m^3/L/kg/mg))

In the second stage, application of the system will be extended to other organic wastes as the toxics and hazardous chemicals. Also the coverage will be expanded to the domestic and commercial sources across the country.

The brochure of the LLDA describes the effects of this system as follows.

Old system: 1. Command and control, Burden of proof was on government calling to question technical capability of regulators ; 2. Cheaper to pay fine than set up a treatment plant resulting in polluted water that affects production in other industries ; and 3. Domestic polluters not accountable for pollution.

New System : 1. Burden of proof is on industry. Ultimate measure is quality of outflow bringing about a real incentive to minimize pollution ; 2. Real economic incentive to set up a treatment plant. To avoid higher user's fee, companies may adopt waste minimization strategies and new cleaner technologies ; and 3. All polluters pay. Environmental management is a shared responsibility among the government, industry and community.

4) Prospective Trends in Environmental Control over the Area around Laguna Lake

Water quality criterion "Class C" is applied to the areas around Laguna Lake, such as Metropolitan Manila, Cavite, Laguna and Batangas. In Class C, a BOD effluent criteria value of 50 mg/l is applied to new plants. According to the LLDA person in charge, "Stricter criteria will be applied step by step to the areas around Laguna Lake, because the government is planning to use the water of the Laguna Lake as drinking water in the future." That suggests that companies coming into the area from now on will need to prepare treatment equipment in advance to be able to satisfy criteria stricter than the present ones. Though it is not clear how the criteria will be revised, they are expected to be upgraded from Class C to B and then to A.

However, regarding the revision of the criteria, the person in charge said, "We will not revise the criteria all at one time. We are planning to upgrade them step by step in

proportion to the degree of improvement of companies. We will tackle this with the cooperation of industry and sometimes NGOs, not in a form in which the government forces the criteria on companies unilaterally."

5) Analysis of Water Quality

There are no private laboratories (Analysis Organization) authorized by the DENR. The DENR is preparing guidelines for the government to authorize laboratories, and the guidelines are subject to approval by the concerned departments in the government. This is because the government laboratories alone cannot deal with the situation due to the development of new measures such as introduction of the Environmental Users Fee system.

6) Penalties for Violating the Criteria

Penalties for violating the criteria are less than 5,000 pesos per day, based on Presidential Decree No. 984.

5. Countermeasures against Air Pollution

The causes of air pollution in Philippine cities can be divided into two, according to type of source: mobile sources such as automobiles and fixed sources such as power plants and factories. Notably, research conducted in the Manila metropolitan area in 1990 revealed that an estimated 21% of particle-like substances, 83% of nitrogen oxides, 99% of carbon monoxides and 12% of sulfur oxides are due to automobile exhaust.

A program has been put in place to combat this automobile emission. Privately owned vehicles that are more than five years old are legally required to undergo exhaust tests when they are registered. Two testing sites have been established in Manila for this purpose, but improvements on diesel engines and jeepneys are insufficient and these are perpetrating air pollution.

To deal with fixed sources of pollution, newly built factories are required to have pollution preventive equipment. Before start of operation is approved, Environmental Management Bureau DENR conducts emission tests, lays down the pollution and environmental standards and assesses pollution control equipment.

The latest legislation relating to air pollution, which has been amended several times as has the legislation relating to water pollution, is the DENR Administrative Order No. 14 and No. 14a "Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978," which were promulgated on March 18, 1993. The Order lays down quality guideline for criteria pollutants, which are divided into short term and long term. Concentrations, averaging exposure time and analysis methods are laid down for source specific air pollutants. Furthermore, the Order stipulates pollutants, sources, standard values and analysis methods relating to the national emission standards for source specific air pollutants.

For emission control of sulfur compounds, the Order also stipulates ratios for sulfur

contained in liquid and solid fuel used at existing fixed emission sources, as well as emission standards for sulfur oxides in stationary sources. These are shown in Figures 1-11 through 1-14.

Automobile emissions are controlled by PD1181; Prevention, Control & Abatement of Air Pollution from Motor Vehicles & for Other Purposes / Motor Vehicle Pollution Control, and Government Notice No. 551, which stipulates installation of pollution prevention equipment in automobiles.

Figure 1-11 National Ambient Air Quality Guideline for Criteria Pollutants

Pollutant	Short Term (a)			Long Term (b)		
	ug/Ncm	ppm	Averaging time	ug/Ncm	ppm	Averaging time
Suspended Particulate						
Matter (e)- TSP	230 (f)		24 hours	90	--	1 yr. (c)
PM-10	150 (g)		24 hours	60	--	1 yr. (c)
Sulfur Dioxide (e)	190	0.07	24 hours	80	0.03	1 yr.
Nitrogen Dioxide	150	0.08	24 hours	--	--	--
Photochemical Oxidants	140	0.07	1 hour	--	--	--
as Ozone	60	0.03	8 hours	--	--	--
Carbon Monoxide	35 mg/Ncm	30	1 hour	--	--	--
	10 mg/Ncm	9	8 hours	--	--	--
Lead (d)	1.5	--	3 months (d)	1.0	--	1 yr.

Note:

a. Maximum limits represented by ninety eight percentile (98%) values not to be exceeded more than once a year.
b. Arithmetic mean
c. Annual Geometric Mean
d. Evaluation of this guideline is carried out for 24-hour averaging time and averaged over three moving calendar months. The monitored average value for any three months shall not exceed the guideline value.
e. SO_2 and Suspended Particulates are sampled once every six days when using the manual methods. A minimum number of twelve sampling days per quarter or forty eight sampling days each year is required for these methods. Daily sampling may be done in the future once continuous analyzers are procured and become available.
f. Limits for Total Suspended Particulates with mass median diameter less than 25-50 um.
g. Provisional limits for Suspended Particulates with mass median diameter less than 10 microns until sufficient monitoring data are gathered to base a proper guideline.

DENR Administrative Order No.14;Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978 (DENR, March 18 1993)

Figure 1-12 National Ambient Air Quality Standards for Source Specific Air Pollutants from Industrial Sources/Operations

*Pollutants (a)	Concentration (c)		Averaging time (min)	Method of Analysis/ Measurement (b)
	ug/Ncm	ppm		
1. Ammonia	200	0.28	30	Nesselerization
2. Carbon Disulfide	30	0.01	30	Tischer Method
3. Chlorine and Chlorine compounds expressed as Cl_2	100	0.03	5	Methyl Orange
4. Formaldehyde	50	0.04	30	Chromotropic acid method or MBTH-Colorimetric method
5. Hydrogen Chloride	200	0.13	30	Volhard Titration with Iodine solution
6. Hydrogen Sulfide	100	0.07	30	Methylene Blue
7. Lead	20		30	AAS[b]
8. Nitrogen Dioxide	375 260	0.20 0.14	30 60	Griess-Saltzman
9. Phenol	100	0.03	30	4-Aminoantipyrine
10. Sulfur Dioxide	470 340	0.18 0.13	30 60	Colorimeteric-Pararosaline
11. Suspended Particulate Matter				
TSP	300	--	60	Gravimetric
PM-10	200	--	60	-do-

Notes:

a. Pertinent ambient standards for Antimony, Arsenic, Cadmium, Asbestos, Nitric Acid and Sulfuric Acid Mists in the 1978 NPCC Rules and Regulations may be considered as guides in determining compliance.

b. Other equivalent methods approved by the Department may be used.

c. Ninety-eight percentile (98%) values of 30-min. sampling measured at 25°C and one atmosphere pressure.

DENR Administrative Order No.14；Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978 (DENR, March 18 1993)

Figure 1-13 National Emission Standards for Source Specific Air Pollutants (NESSAP)

POLLUTANT*	STANDARD APPLICABLE TO SOURCE	MAXIMUM PERMISSIBLE LIMITS (mg/Ncm)	METHOD OF ANALYSIS[a]
Antimony & its Cmpds.	Any source	10 as Sb	AAS[b]
Arsenic & its Cmpds.	Any source	10 as As	AAS[b]
Cadmium & its Cmpds.	Any source	10 as Cd	AAS[b]
Carbon Monoxide	Any industrial source	500 as CO	Orsat Analysis
Copper & its Cmpds.	Any industrial source	100 as Cu	AAS[b]
Hydrofluoric Acid and Fluorine Cmpds.	Any source other than the manufacture of Aluminum from Alumina	50 as HF	Titration with Ammonium Thiocyanate
Hydrogen Sulfide	i) Geothermal power plants	c, d	Cadmium Sulfide Method
	ii) Geothermal Exploration and Well Testing	E	
	iii) Any source other than (i) and (ii)	7 as H_2S	Cadmium Sulfide Method
Lead	Any trade, industry or process	10 as Pb	AAS[b]
Mercury	Any source	5 as elemental Hg	AAS[b]/cold-Vapor Technique or Hg Analyzer
Nickel and its Cmpds. Except Nickel Carbonyl[g]	Any source	20 as Ni	AAS[b]
No_x	i) Manufacture of Nitric Acid	2,000 as acid and NO_x calculated as NO_2	Phenol-disulfonic acid Method
	ii) Fuel burning steam generators		-do-
	Existing Source	1,500 as NO_2	
	New Source		
	Coal-fired	1,000 as NO_2	
	Oil-fired	500 as NO_2	
	iii) Any source other than (i) and (ii)		-do-
	Existing Source	1,000 as NO_2	
	New Source	500 as NO_2	
Phosphorous Pentoxide	Any source	200 as P_2O_5	Spectrophotmetry
Zinc & its Cmpds.	Any source	100 as Zn	AAS[b]

a Other equivalent methods approved by the Department may be used.
b Atomic Absorption Spectrophotometry
c All new geothermal power plants starting construction by 01 January 1994 shall control H_2S emissions to not more than 150 g/GMW-Hr.
d All existing geothermal power plants shall control H_2S emissions to not more than 200 g/GMW-Hr. within 5 years from the date of effectivity of these revised regulations.
e Best practicable control technology for air emissions and liquid discharges. Compliance with air and water quality standards is required.
f Provisional Guideline
g Emission limit of Nickel Carbonyl shall not exceed 0.5 mg/Ncm.
* Limits of other air pollutants not included in this table but appearing in the 1978 regulations shall be maintained.

DENR Administrative Order No.14 ; Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978 (DENR, March 18 1993)

Figure 1-14 Control of Sulfur Compound Emission

(1) Sulfur Content of Fossil Fuels for Existing Sources

(a). Liquid Fuel	Metro Manila	Outside Metro Mla
(i). Fuel Oil (All grades)		
July 1, 1993	3.5%	3.8%
January 1, 1996	3.0%	3.0%
(ii). Industrial Diesel		
July 1, 1993	0.7%	0.8%
January 1, 1996	0.5%	0.5%
(b). Solid Fuel (Coal)		
July 1, 1993	2.5%	2.5%
January 1, 1996	1.0%	1.0%

(2) Maximum Permissible Emission Limits for Sulfur Oxides in Stationary Sources

(1). Existing Sources	
(i). Manufacture of Sulfuric Acid and Sulf(on)ation Process	2.0 gm/Ncm as SO_3
(ii). Fuel Burning Steam Generators	1.5 gm/Ncm as SO_2
(iii). Other Stationary Sources except (i) and (ii)	1.0 gm/Ncm as SO_3
(2). New Sources	
(i). Manufacture of Sulfuric Acid and Sulf(on)ation Process	1.5 gm/Ncm as SO_3
(ii). Fuel Burning Steam Generators	
January 1, 1994	1.0 gm/Ncm as SO_2
January 1, 1998	0.7 gm/Ncm as SO_2
(iii). Other Stationary Sources except (i) and (ii)	0.2 gm/Ncm as SO_3

DENR Administrative Order No.14；Revised Air Quality Standards of 1992, Revising and Amending the Air Quality Standards of 1978 (DENR, March 18 1993)

6. Countermeasures against Solid Waste

The volume of solid waste produced per day in Metropolitan Manila is about 0.6 kg per capita (as of 1994) and has increased steadily each year, as shown in Figure 1-15. It is said that 77 to 90 percent of solid waste in Metropolitan Manila are processed at three treatment facilities or recycled, and the remaining 10 to 23 percent is dumped in vacant lots, roadsides, riverbanks and rivers.

Figure 1-15 Amount of Solid Waste Produced in Metropolitan Manila (per day)

Year	Amount
1982	2,633 t
1988	3,339 t
1993	4,911 t
1994	5,000 - 5,400 t

At present, almost all waste are disposed in open dumpsites without waste water treatment facilities or water barrier sheeting, but such disposal sites are going to be closed. For instance, the disposal site in Tondo known as "Smoky Mountain" was closed in May 1993, and the disposal site in Pasig was closed in September 1994. However, even the "sandwich method" of covering filled waste material with soil is not being used for reason of expense, nor are appropriate disposal sites being built. Such being the situation, waste disposal sites have given rise to various pollution including sanitation problems such as insect plague, as well as spontaneous combustion of refuse, malodor, and water pollution. Besides, there is considerable amount of refuse that goes without being collected and becomes illegally dumped in rivers and lakes. This is another big cause of water pollution. Meanwhile, a survey reveals that two existing sites will be able to process only about 40 percent of collected waste because enough substitute sites for the closed sites have not been built.

The collection and disposal of solid waste is the responsibility of local authorities, according to the law. Despite the methods of disposal adopted as described above, the increased cost of refuse disposal is now a problem.

Major laws dealing with waste are:- PD 825: Providing Penalty for Improper Disposal of Garbage and Other Forms of Uncleanliness and for Other Purposes, issued in 1975, which lays down penalties for illegal disposal of waste; PD 856: Code on Sanitation, which stipulates the waste disposal responsibility of local authorities. In this PD 856, standards for drinking water, sewage, and waste disposal are given. In Chapter 5 of the PD 1152, issued in 1977, a waste disposal plan and waste disposal methods are laid down.

In order to tackle these waste disposal problems, the construction of a waste relay station and a controlled landfill site is planned. Speedy execution of these projects are now urgently required.

As for industrial waste, Republic Act; RA 6969; Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990 was enacted in 1990. However, action is lagging behind. Research into what waste materials are produced by major industries and establishing a disposal plan based on these findings, construction of disposal sites and treatment facilities - all these are requiring swift attention. The problem is that landfilling with toxic waste is prohibited at present, yet there are no facilities to process

the waste.

Not only Japanese companies but also other foreign affiliate companies, are calling for the construction of facilities to process toxic solid waste. Presidential Task Force on Waste Management coordinated by the DENR, was established in 1987. The government is now beginning to tackle this problem. The World Bank and the European Union (EU) have already conducted a survey to identify locations for facilities to process toxic waste. The survey shows that when it comes to processing facility sites, many residents protest against the construction of facilities near their home, or in their town or province. The government at one point decided to prepare a landfill site in Carmona southwest of Manila, but this has not gone ahead due to strong opposition by the local authorities and municipalities. According to the DENR person in charge, the government will solve this problem within a couple of years, so companies are required to store sludge and the like.

7. Future Trends of Environmental Measures

The Philippine government now implements regulative measures based on laws and economic measures such as the environmental users fees. Furthermore, the government is planning to launch a project called "Ecowatch," a sociocultural approach, as a third measure from the end of 1997.

This project classifies companies by stage of pollution prevention by assigning them "symbolic colors." Names of companies are announced publicly, providing a kind of company version of the ecolabel system. Companies with no specific measures to prevent pollution are classified as "black." Companies addressing pollution issues to some degree but not satisfying the criteria are classified as "red." Companies satisfying the criteria are classified as "blue." Companies implementing measures that more than satisfy the criteria are classified as "green." Companies that stay green for 3 years or more are classified as "gold."

For the time being, the LLDA is running this project independently, and is planning to apply the project to the whole country in the future.

The government also has an Industrial Environmental Management Project (IEMP) to promote reductions in the amounts of effluent and environment inspections. The purposes of this project are: 1) to prevent or reduce pollution at the source; 2) to reclaim industrial wastes; and 3) to encourage cost-effective pollution abatement technologies. The details include 1) Pollution Reduction Initiative which involves promotion of pollution management appraisals, environmental risk assessment and technology transfer initiatives; 2) Policy Studies and Public/Private Dialogues which supports a wide range of policy analysis to institute improvements in the existing industrial regulatory framework; and; 3) the Capability Building Component which helps effect technology transfer to local organizations and professionals needing to improve their industrial pollution management skills.

Chapter 2: Case Study Relating to Effluent Treatment

Companies should of course take measures to prevent pollution to mitigate environmental problems. Japanese companies are taking countermeasures against waste water, which is a key factor in pollution prevention in the Philippines. The case studies introduced in Chapter 2, 3, 4 and 5 illustrated companies facing environmental problems, selected mainly from those companies which answered questionnaires in 1995. After interviewing them in detail about their environmental measure by visiting these companies, we asked them to freely write reports about the measures they had taken. The following case studies are drawn from those reports after editing by our survey team.

Case 1: Appropriate Effluent Treatment of Waste Water Containing Chromium, Taking Advantage of Lack of Treatment Operators

1) Profile of the company

Company A	
Business activities:	Manufacture and sale of advanced precision electronic components
Number of employees:	Approximately 1,100
Start of operation:	1989
Location:	Export processing zone in a suburb of Manila
Ownership ratio of headquarters in Japan: 100 percent	

2) Background

Company A's top management policy with regard to environmental control standards is basically that of "clearing Japanese emission standards," as instructed by its head office in Japan.

Company A conducts chromate surface processing on magnetic products used in personal computers by creating corrosion-resisting chromate film by immersing galvanized substances in anhydrous chromic acid solution. The problem was how to treat waste water containing hexavalent chromium after chromate processing. In Japan, waste water is stored in a drainage tank and a specialist treatment operator is paid to remove it. In the Philippines no such operator with the specialist technology and equipment could be found, so Company A was obliged to deal with the effluent problem with its own in-house facility. Company A intended to carry out waste water treatment suitable to the situation in the Philippines in order to create an efficient system.

3) Contents

A Japanese waste water treatment plant manufacturer was commissioned to make the treatment equipment. Equipment capable of processing a maximum of 400 liters of chromate effluent per day was installed at an expense of 15 million Japanese yen. Figure 2-1 outlines the system of treatment equipment. Figure 2-2 shows the flow of chromate effluent treatment.

Figure 2-1 Waste Water Treatment Equipment

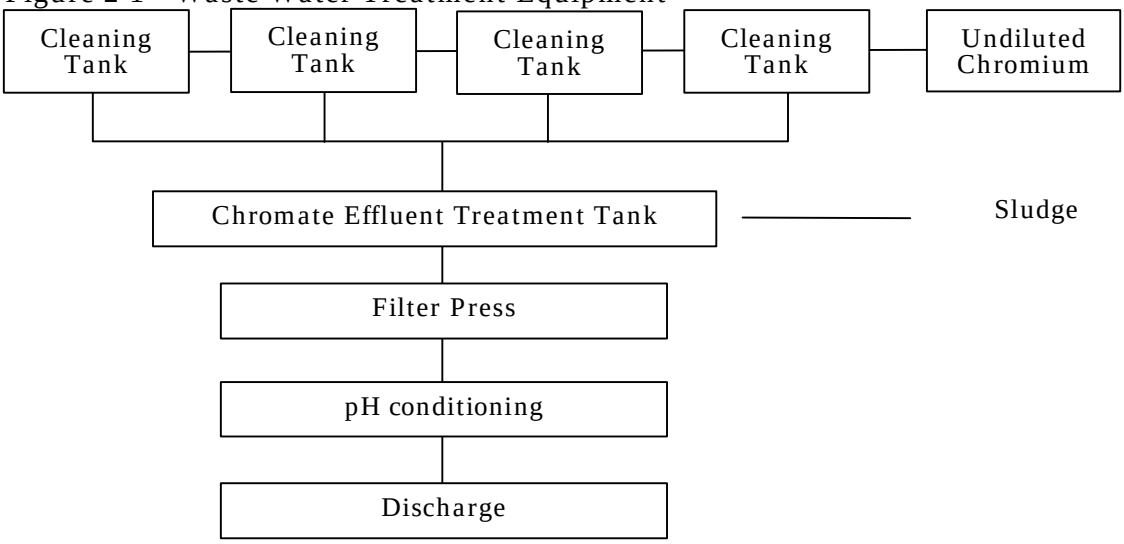
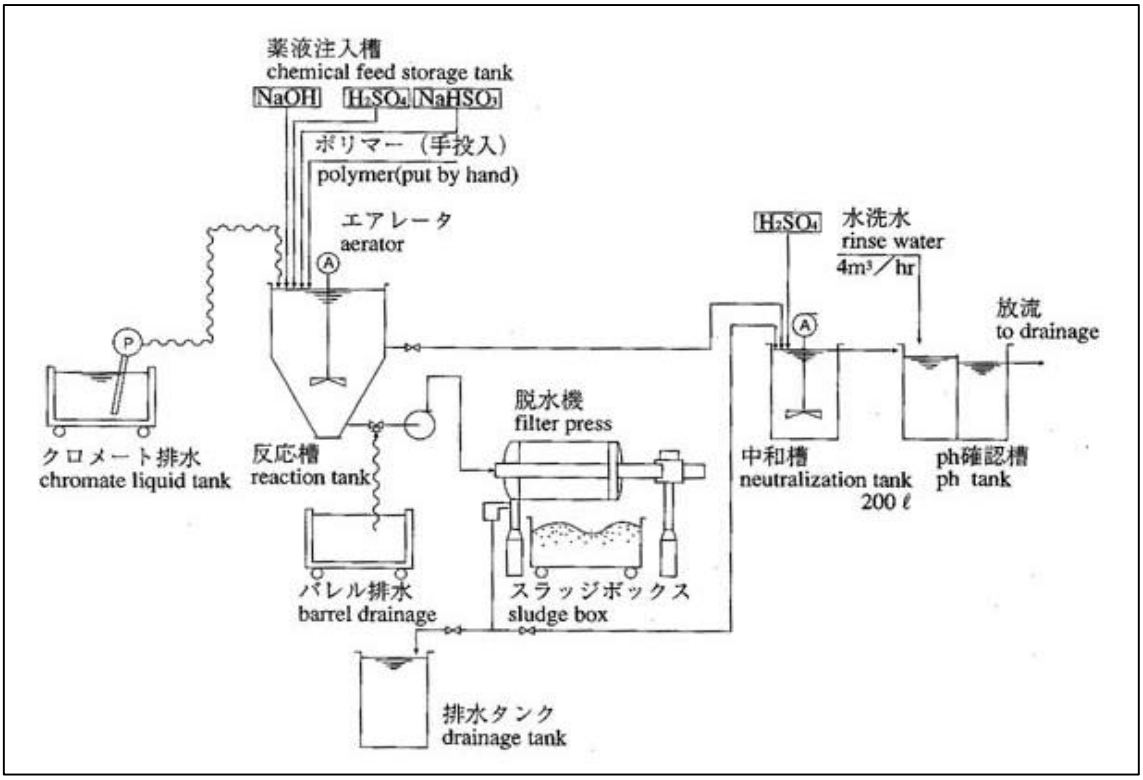


Figure 2-2 Flow of Chromate Effluent Treatment

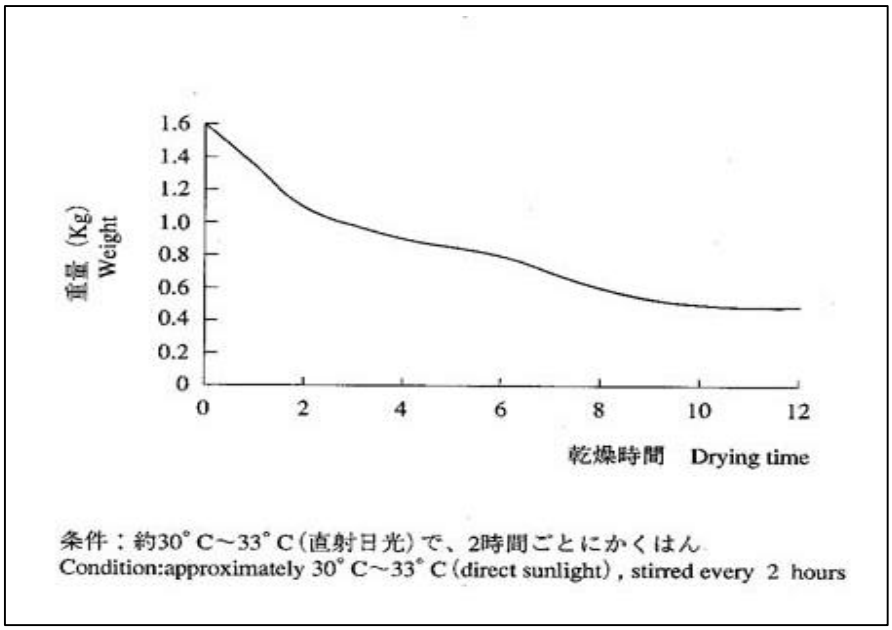


For the surface processing of magnetic products, a chromium solution of 1200 mg/l (maximum concentration) is used. The treatment method is as follows: sulfuric acid is added to chromate effluent containing hexavalent chromium after surface processing, in order to reduce the pH level to 3 or below; using sodium bisulfate as reducing agent, hexavalent chromium ion is reduced to the harmless trivalent chromium ion; then caustic soda is added to raise the pH level to about 8 and sediment chromium hydroxide sludge; this sludge is then dehydrated; after sedimentation, the waste water is neutralized; the pH is checked and the water is discharged. Due to this treatment, the effluent fully clears the current 0.1ppm regulation standard.

It must be noted that because a large expenditure had not been made on the waste water treatment equipment, the equipment could not be fitted with expensive electromagnetic valves, and therefore, the adjustment and operation of the system is carried out manually.

The chromium sludge is sun dried in order to reduce it in weight by taking advantage of the sunny climate in the Philippines. 1.6kg of sludge could be reduced to 0.5kg in 12 hours (see Figure 2-3). The remaining sludge is stored within the plant.

Figure 2-3 Result of Chromium Sludge Sun-dry Reduction Test



4) Issues for the future

Company A intends to carry out local treatment of the chromium sludge, using a local contractor with the specialist technology and facilities. Also, it is considering the reduction of the chromium intake itself by controlling the chromating equipment operation. In the near future, action is to be stepped up: for example, through closed treatment and recycling by ion exchange resin process, Company A hopes to make voluntary regulation of total effluent emission, making maximum effort to restrain the discharge of effluent into the environment.

Currently, chromium levels are measured once a week. Instrumentation will be switched to absorptiometer to improve analytical precision. The measurement of BOD and COD is also thought to be necessary.

It is important to inform and educate employees as to why effluent treatment is being conducted. Training is at present being given to leader class personnel, but in future, training is to be extended to all members of staff.

Case 2: Establishment of Waste Water Treatment Facilities to Prevent Water Quality Accidents in Advance

1) Profile of the company

Company B	
Business activities:	Manufacture and sale of electronic components and products for floppy disc drives and video cassette recorders
Number of employees:	Approximately 1,900
Start of operation:	1987
Location:	In a suburb of Manila
Ownership ratio of headquarters in Japan: 51 percent	

2) Background

At the design stage of a new plant, the pending problem for Company B was treatment of the waste water discharged from the Memory System Department's base-board cleaning process. However, it was discovered that the synthetic detergent used by the spray cleaning system to clean the base boards was no different from that used by domestic households, and disposing of this into the waste water system was not deemed to be a problem. Consequently, waste water treatment facilities were not installed, and the waste water was discharged directly from the factory into a sewerage system that emptied into a river when the plant started operation.

However, a certain amount of discoloring was noticed in the river about one year later, and the discharge of waste water was suspended. A new waste water treatment facility was decided to be installed, and until it became fully operational, the waste water was stored in steel drums in a warehouse on the plant site. Once the treatment facility was up and running, the waste water was subjected to the necessary processing.

3) Cost

The total cost of constructing the waste water treatment facility (with a processing capacity of 2 cubic meters per day) was approximately 1.8 million Philippine pesos.

4) Contents

The waste water discharged from the base boards cleaning process is chemically treated (see Figure 2-4). The treated waste water is analyzed by an independent third-party organization once a month. Figure 2-5 shows average figures of the waste water for the last 12 months.

Since the treatment facility was installed, the figures have satisfied the waste water criteria established by the DENR.

5) Issues for the future

From now and into the future, every time new processes discharging waste water are established, Company B will always consider setting up a waste water treatment facility from these new stages in development.

Figure 2-4 Flow of Waste Water Treatment of Company B

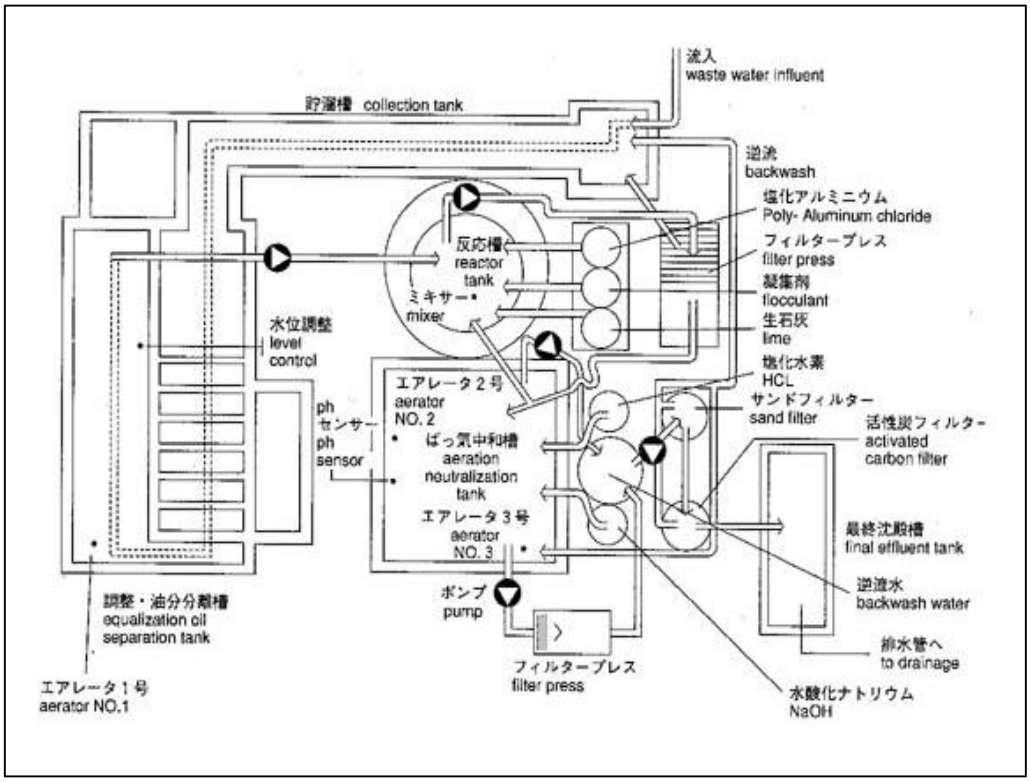


Figure 2-5 Average Value of the Waste Water in Company B for the Last 12 Months

Parameters	Influent (ppm)	Effluent (ppm)
COD		58.12
BOD (5 days, 20°C)	36,480	24.91
COLOR		12.25
TOTAL DISSOLVED SOLIDS		398.92
TOTAL SUSPENDED SOLIDS	15,050	8.13
SETTLEABLE SOLIDS		ND
OIL & GREASE	183,296	4.77
SURFACTANTS as MBAS		8.6
PHENOL		ND
PH	7.45	7.61
CADMIUM (Cd)		<0.003
MERCURY (Hg)		<0.01
CHROMIUM (Cr)		0.080
LEAD (Pb)	0.51	<0.02
ARSENIC (As)	ND	ND
COLIFORMS	<2.2	<2.2

Note: ND is none detected. Minimum Detection Limits are (in ppm): As=0.001, SS=0.1

Case 3: Plating Waste Water Treatment to Prevent Efflux of Poisonous Cyanide from Factory

1) Profile of the company

Company C	
Business activities:	Manufacture and sale of zippers
Number of employees:	Approximately 220
Start of operation:	1978
Location:	An industrial park in a suburb of Manila
Ownership ratio of headquarters in Japan: 50 percent	

2) Background

Plating processes are partially used in zipper manufacturing. The plating processes use soda cyanide solution containing copper cyanide, which generates a sludge containing cyanide after treatment. Company C has expanded its facilities every year since it set up in 1978, according to the company's policy that no poisonous cyanide be discharged from its factory. The number of dyeing machines has increased from the initial 3 to 17 at present. The number of waste water tanks also has increased accordingly. Company C believes it necessary to tackle environmental management and to take action to prevent pollution and the discharge of cyanide from its factory.

Its headquarters in Japan is constructing an environment management system; the local factory will then implement and continuously improve upon the system. The headquarters established an environmental charter in October 1992 and group companies, including overseas factories, established such a charter in September 1994. The charter states that "Company C aims to be an 'earth-friendly company' and promotes 'harmony with the environment' as one of its top business priorities" (excerpt) and has eight action guides. Company C also has 11 items for "Action Programs Based on the Environmental Charter" and has set numerical targets to be achieved.

The 11 items in the Charter concern the following: protecting the ozone layer, countermeasures to prevent global warming, reducing industrial waste, recycling old paper, reducing packing materials, transportation measures, social activities, environment preservation activities, preventing disasters, environment inspections and environment businesses.

3) Organization

Employees who have other responsibilities are in charge of environmental issues. Several employees are involved because of the need to communicate with government bodies and to understand the detailed implications of changes in standards. Local staff in charge of environmental issues participate in meetings and seminars about amendments to environmental standards that are held periodically by government bodies.

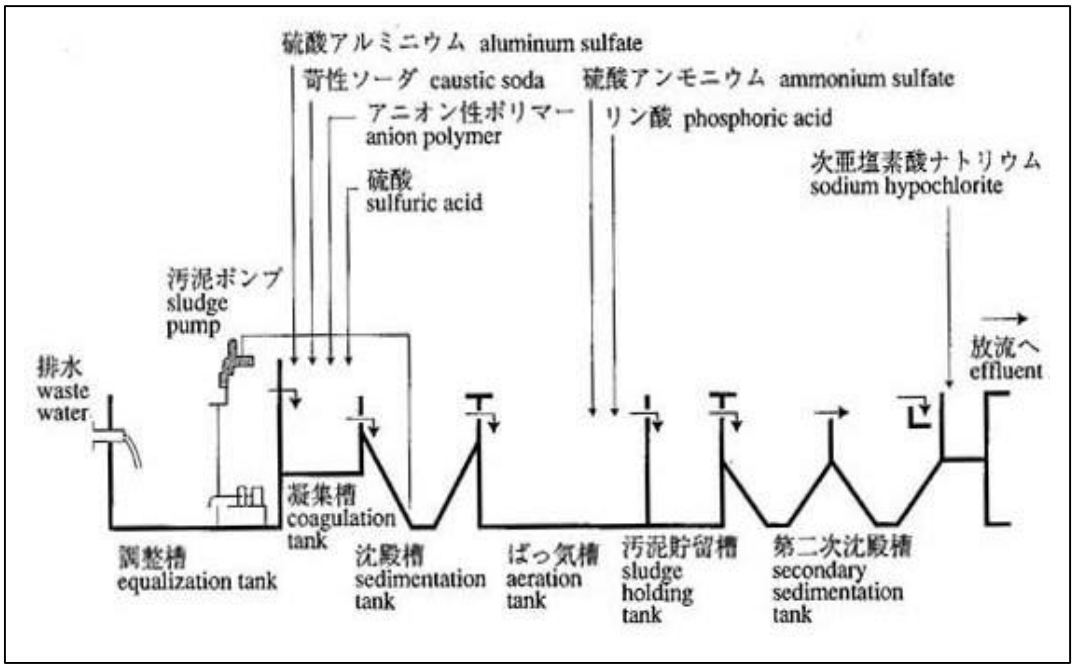
4) Contents

Company C clearly defines seven typical kinds of pollution, decides their priorities, and then tackles them. Water quality is voluntarily measured in waste water treatment facilities every day. Samples of waste water are sent to a government research center once a month, and analysis reports are kept. The government makes a 24-hour on-the-spot inspection of the facilities annually. The facilities are considered to be acceptable because the results of all tests have satisfied the waste water criteria.

As shown in Figure 2-6, the actual flow of a waste water facility consists of a physicochemical process using sulfuric acid and a biological process. The former physicochemical process removes poisonous cyanide compounds completely from the waste water, and the latter biological process purifies the waste water to a level which satisfies the waste water criteria.

This method has no problems concerning the quality of waste water. In the physicochemical process involving sulfuric acid that is used by Company C, cyanide compounds in waste water are precipitated and removed by a chemical reaction. Therefore, a sludge containing the precipitated cyanide compounds remains, and processing of this sludge causes the following problem.

Figure 2-6 Flow of Waste Water Treatment of Company C



5) Issues for the future

At the request of the Philippine University, Company C accepted two intern students worked at the facilities to learn about the waste water system in 1996. As a result, Company C receives many visitors not only from universities but also local companies who wish to improve their own facilities, thus requiring a little effort to be made to accommodate these visitors every day. Company C intends to serve the local community

by keeping its criteria and, if possible, voluntarily tightening the criteria.

The gilding process generates sludge containing cyanide compounds and there is no processing contractor. Therefore Company C is now considering the following options: 1) To ask mining and manufacturing contractors about burning treatments; or 2) To utilize the sludge by turning it into cement for concrete blocks at its site. Currently, sludge is put into storage and measures are taken to prevent scattering or percolation down into the soil.

As stated above, Company C has an outside body analyze its waste water once a month, and is planning to establish in-house measurements and analysis systems in order to carry out analyses on a daily or weekly basis.

Case 4: Establishment of an In-House Laboratory for Analysis of Waste Water Quality

1) Profile of the company

Company D	
Business activities:	Manufacture and sale of automobile parts (transmissions, uniform-speed joints, etc.)
Number of employees:	Approximately 430
Start of operation:	1992
Location:	An industrial park in the Laguna area
Ownership ratio of headquarters in Japan: 95 percent	

2) Background

Situated in the Laguna area, Company D discharged all effluent from its waste water treatment plant straight into the adjoining Laguna Lake. Supplying about 90 percent of the fish consumed in the surrounding area, Laguna Lake is applied Class C standards of water quality in order to preserve marine life.

Company D began to use treated waste water for watering plants on its site, and thus successfully reduced the amount of waste water discharged into Laguna Lake by 80 percent in 1997.

It is part of the company's basic policy to cause absolutely no pollution. In keeping with this policy, it decided to construct a waste water treatment plant and consigned analysis of waste water to a private organization. However, it took the step of establishing its own waste water analysis laboratory in 1992 because of the high consignment fees and to ensure better compliance with the legislative controls.

3) Contents

Company D began mass production of automobile transmissions in 1992 when it consigned analysis of waste water quality to a private organization and submitted self-monitoring reports monthly to the Laguna Lake Development Authority (LLDA). It established its own laboratory for waste water analysis in early 1992. In late 1993, it purchased and installed equipment capable of analyzing all the items required under the Class C standards of the DENR.

The waste water laboratory of Company D is capable of analyzing almost all important parameters listed under the Class C standards.

The waste water analyses are performed by local personnel who have received training in laboratory work and related fields. Chemical solutions and reagents are also available in this laboratory.

Chapter 3: Case Study of Decreasing Burdens on the Environment by Improving Manufacturing Processes

"Clean technology," quite different from the so-called "end-of-pipe" countermeasures against pollution in traditional control, is attracting great attention. This new technology involves preventing pollutants from being discharged by changing the raw materials and processes in the manufacturing process. This approach not only eliminates pollutants, but is cost-effective in many cases. This chapter introduces a case where a company reduced the burden on the environment by improving its manufacturing process.

Case 5: Environmental Conservation with the Use of Clean Technology and the Thorough Processing of Waste Water

1) Profile of the company

Company E	
Business activities:	Manufacture and sale of automobiles
Number of employees:	Approximately 1,900
Start of operation:	1988 (a factory in Metropolitan Manila), 1997 (a factory in a suburb of Manila)
Location:	One in Metropolitan Manila and another in a suburb of Manila
Ownership ratio of headquarters in Japan: 40 percent	

2) Background

Company E is involved in the waste water treatment measure and a wide variety of other projects to reduce the environmental burden. These projects are carried out not only to prevent pollution by the so-called "end-of-pipe" measures, but also from the viewpoint of "clean technology," which prevents the generation of burdens on the environment by improving the relevant processes and modifying raw materials and other elements. The measures can be classified into three categories; the improvement of conventional production processes, measures to control the source of waste emissions through the implementation of source reduction schemes, and the other forms of improvement.

3) Improvement of the conventional production processes

①Reductions in the use of primer paint

The amount of paint used on automobiles has been reduced by improving the methods of painting interior panels and by using more systematic spraying methods. Reductions in the amount of paint used also leads to lower costs and reductions in the creation of solid waste. A 15% reduction in paint usage has reduced the amount of Volatile Organic Compounds (VOC) emission by 15%.

②Installment of the Minibell spray

The Minibell spray was installed in a new plant to reduce the amount of paint consumption and VOC discharge by improving the efficiency of movement during the painting process. Unlike conventional spray guns, the Minibell spray is basically automated, and its installation allows a reduction in labor and improvements in quality.

In the conventional painting process, only 30 to 40% of the paint was effectively sprayed onto the cars, and the remainder, between 60 and 65% was discarded into the sludge pool as paint sludge (solid waste) because this process was manually operated by laborers. These figures have now been improved through the use of the Minibell spray, and an efficiency rate has risen between 65 and 70%. This not only reduces the

amount of paint being wasted to the level of 30 to 35%, but also reduces the amount of solid waste. In addition to this, this facility does not require man-power, thus helping to streamline the factory.

4) Source emission measures

③Reduction of sludge generated from painting processes

Previous painting processes usually created sludge containing a massive amount of phosphate. Company E trained its workers on how to use phosphates used in pretreatments appropriately and successfully improved its facilities.

In the conventional car body painting processes, the pretreatment of metal, which also prevented rusting, was done by applying a chemical conversion coating of phosphates by spraying manganese phosphate and zinc phosphate solution on the surface of the iron base prior to painting. However, trivalent iron ions are dissolved and oxidized to become iron phosphate, then precipitated to become sludge. Experience shows that the amount of sludge depends on the amount of phosphates sprayed.

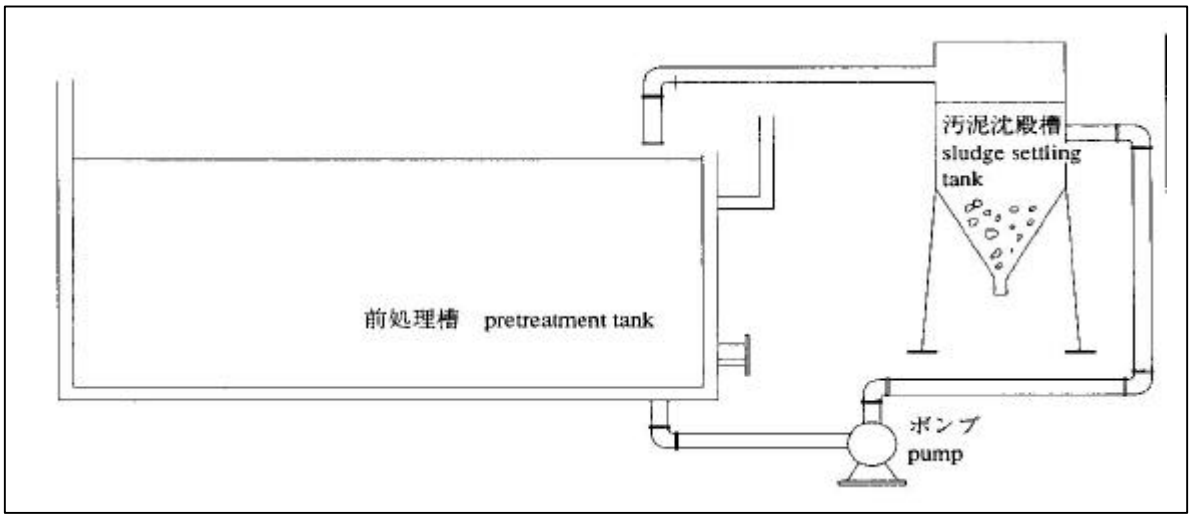
A review of the painting processes revealed that the amount of sludge could be reduced by redesigning the spraying method. Two kinds of process improvements were made to reduce the amount of sludge as follows.

One involved preventing the excessive use of pretreatment chemicals which could increase the amount of sludge by properly managing the equipment for phosphates used in the pretreatment process. Workers were trained to judge the proper amount of pretreatment chemicals in case of equipment trouble, and as a result the amount of sludge decreased. The decreased use of phosphate also reduced costs.

On the other hand, although the sludge that accumulated in the pretreatment tanks was removed weekly, the gradual accumulation of sludge increased the amount of work. When the tank was full of sludge, the phosphate content in the tank decreased and the paint quality was adversely affected.

A sludge settling tank was therefore added and a pump for removing sludge was installed to improve the facility. As a result, sludge could be removed while the facility was still operating. The improvement also prevented the pretreatment chemicals from overflowing from the pretreatment tank, minimized the COD load on the waste water treatment facility, and improved the quality of film during the pretreatment process.

Figure 3-1　Reduction of Sludge Generated from Pretreatment Process of Painting



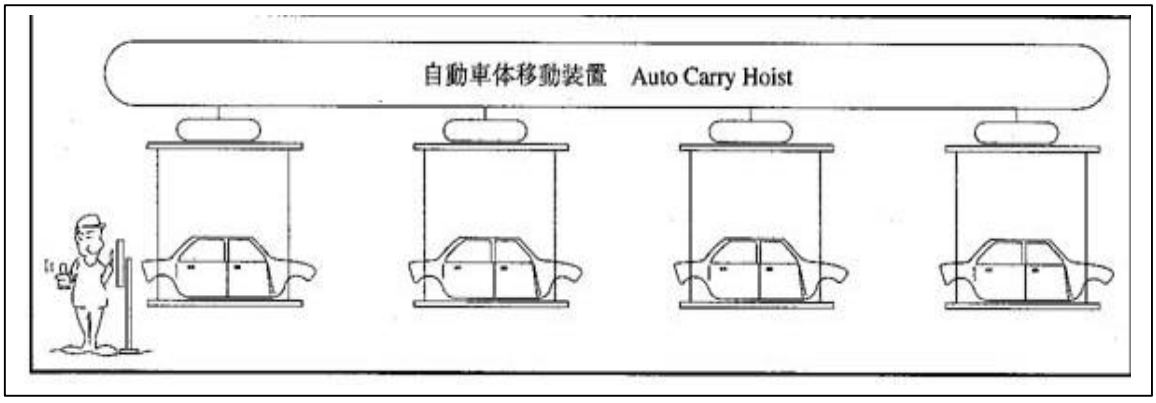
④Improvement in the quality of waste water after Electrodeposition (ED) painting

Paint carry-over after the electrodeposition (ED) paint process is the principle cause of COD load and lead content of waste water treatment facilities.　Therefore, facilities were improved to reduce the inflow of paint carry-over.

After the application of ED paint, car bodies pass through several washing baths to rinse off that excess paint.　However, the conventional carrying hoists of car bodies were manually operated, which made it difficult to control the waste water quality due to the irregular timing of rinses.　An automatic hoist called an "ED Auto Carrier" was then installed to ensure a constant pass time for each washing bath.　In addition, the rinse time and drying time between each washing bath were prolonged to prevent rinsed-off paint from coming off into the wash water.　A mechanism to immediately collect and return water for washing into the ED paint baths was also installed.

These improvements on the facility minimized ED paint carry-over and reduce the COD load and the lead content of waste water flowing into the waste water treatment facility.

Figure 3-2　Newly-Installed Auto Carry Hoist



⑤Recycling used solvents to reduce loads on waste water facilities

To reduce the load on waste water treatment plants using solvents in various kinds of processes, used thinner was recycled and, as a result, manufacturing costs were significantly reduced.

In the conventional process, lacquer thinner was used as a cleansing agent to wash the paint from the spray suits, spray guns, pressure tanks, mixing tanks and as a rinsing agent of paint containers, and the used thinner was discharged from the spray booth water directly to waste water treatment plant and was neutralized there.

In the improved process, the used thinner is collected through the pipe from the cleansing bath into drums and then sent to the recycling area. Approximately 200 liters of used thinner are collected every day and the amount of thinner which can be recycled is 122 liters in a single process, which takes 5 to 6 minutes.

This project reduced the percentage of used thinner in the waste water treatment plant to 23%, and could minimize COD and VOC (Volatile Organic Compounds) in the treated waste water.

⑥ Efficient waste water treatment by proper management of waste water from the sludge bath

This project involves the thorough management of both the quality and quantity of the waste water discharged from the processes of the sludge bath in order to realize a more effective operation of the waste water treatment plant.

In the conventional waste water treatment process, the discharge of the waste water from the sludge bath depended on the judgement of the person in charge of the production line, and was carried out as occasion arises. This caused a number of problems, such as the ineffective operation of the waste water treatment plant and overflows from the equalization tank.

The improved process uses a Wastewater Dump Request System. The details that must be entered on this request form include the amount of waste water, the date and time that the dump will be started, the type of pollutants that are conceivably contained within the waste water, and the reason for dumping the waste water. According to the form, the Environment Section then carries out checks on the schedule, the capacity of the equalization tank and the characteristics of the waste water before finally instructing the person in charge of the waste water treatment plant.

As a result, the reduction in load on the waste water treatment plants improved the efficiency of waste water treatment and eliminated overflows from the equalization tank.

5) Examples of other improvements

⑦Scrap assortment and complete disposal

This scheme was started for the purpose of selling scrap to external contractors. Scrap was sorted by an assembling process and the total amount of scrap was monitored monthly.

In the conventional process, all scrap from the assembly line was dumped into a large dumpster without sorting, then was processed by a contractor.

In the improved process, the scrap generated by different sections on the assembly line was sorted and transported to a disposal area where the scrap was delivered to the contractor. This eradicates the time the contractor would have to spend to sort the scrap, and also provides a certain amount of revenue by selling the scrap.

From an environmental point of view, this has established a better management system of waste products.

⑧Energy saving by installing power meters

Power meters were installed on all major processes to determine exactly how much energy was being consumed by each process in order to reduce energy consumption.

In the conventional system, the energy consumption of the whole factory including offices was monitored by only one power meter, therefore it was impossible to perform monitoring and analysis for the purpose of reducing the energy consumption of each area.

The improved system adopted a power metering system which allowed the energy consumption of each area to be monitored with individual meters. The easier analysis for reducing consumption provided an emergency measures in case of abnormal situations. A reduction in electric-power consumption also reduces electric-power production, which in turn leads to reduction of the burden on the environment in relation to electric-power production.

⑨Improved working environment by installing a ventilation system

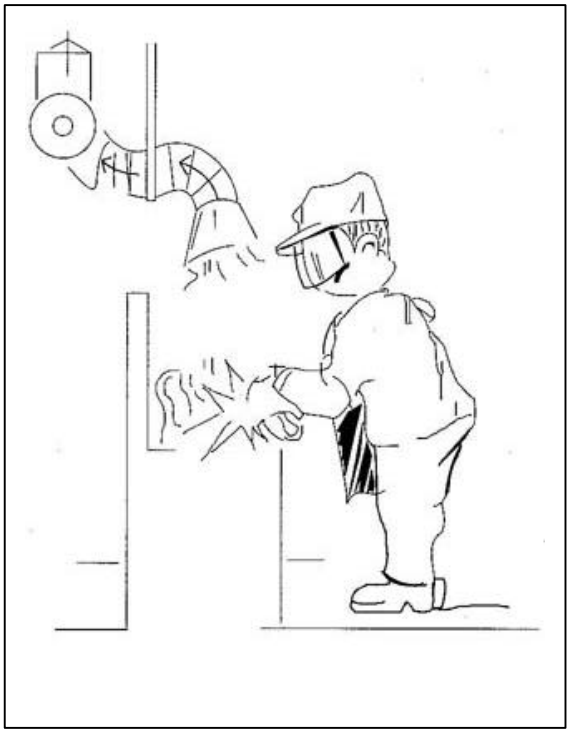
This project involved installing ventilators in the welding area to prevent polluted fumes emitted from the welding area from flowing into other areas for the purpose of improving the working environment of the parts assembly plant.

In the previous process, emissions from metal welding with inert gases or lead soldering during the welding process flowed into the assembly line area and greatly affected the working conditions of the assembly line area. Therefore, ventilators were installed in the welding area.

⑩Improved ventilation on the welding line

Figure 3-3 Ventilators Installed in the Welding Area

This project involved reduction and standardization of the ventilation cycle on the welding line from previous every eleven minutes to every two or three minutes. An additional 27 ventilation outlets to the roof could raise the exhaust capacity by about 12,000 m^3/minute and reduce the amount of heated air in the workplace and dust from the welding line.



⑪Reduction in water consumption

This project was planned and implemented to reduce water consumption due to insufficient supplies and high cost of water in the area where the new plant was located.

In the conventional process, the assembly plant consumed an average of 14,003 cubic meters of water monthly, or 5 cubic meters per unit, between January and June 1995.

The improved system called for the installation of water-saving devices, notice for water saving in washrooms and toilets, the maintenance of a monitoring system, daily inspections carried out in accordance with a check-list, and better maintenance of equipment. In addition to this, team members were instructed to read water meters correctly. Visual controllers were attached to water meters to enable the water consumption limit to be clearly seen, and automatic stop switches were installed in all tanks to prevent overflow.

These improvements resulted in an average water consumption rate of 12,002 cubic meters per month between July and December 1995, or an average of four cubic meters per unit, which led to reduction in the consumption to an average of 11,728 cubic meters per month, or 3.82 cubic meters per unit throughout the year 1996.

⑫Replacing CFCs

The conventional process used the CFC-12 refrigerant, an ozone depleting substance, in all car coolers, but the refrigerant was changed to HFC-134a in all models during 1994.

6) Issues for the future

Company E intends to address the following issues in the future:

① Informing employees: Inform employees about environmental problems, not only regional but global environment issues, by providing information, training courses or seminars.
② Periodical measuring and improvements in the precision of measuring instruments: Clarify the measuring procedures and improve the precision of measuring instruments in order to obtain precise, good results at all times.
③ Recycling treated waste water: Promote the use of recycled waste water in other processes than manufacturing processes.
④ Risk management: Establish effective risk management procedures to minimize accidents involving people and the environment.
⑤ Environmental management: Inaugurate an effective environmental management system to obtain ISO 14001 certificate.

Chapter 4: Other Cases

Companies are carrying out various other kinds of environment protection activities in addition to preventing pollution and reducing the environmental burden of manufacturing processes. This chapter introduces other cases where companies have considered the environment and contributed to society through their products.

Case 6: An Environmental Measure by Group Companies in Concert

1) Profile of the company

Company F	
Business activities:	Manufacture and sale of automobiles
Number of employees:	Approximately 1,600
Start of operation:	1992
Location:	An industrial park in the Laguna district
Ownership ratio of headquarters in Japan: 70 percent	

2) Background

Automobile manufacturer Company F drew up a policy that attached great importance to environmental problems partly because it entered the Philippines after 1990, later than other automobile manufacturers. As a result, Company F installed an excellent waste water treatment facility with both chemical and biological treatment. In 1995, this automobile manufacturer received an award for outstanding service from the President of the Philippines for excellence in its equipment and daily management operations.

3) Contents

In addition to the above efforts, Company F focused on supporting affiliated companies, such as small- to medium-sized parts suppliers which were set up in the Philippines along with Company F, to tackle environmental problems.

Company F, which is a large company and well-experienced in environmental problems, took the lead to solve environmental problems together with its affiliated small- and medium-sized companies which find it difficult to address environmental problems by themselves. Periodic meetings for exchanging information are held by Company F; these provide a forum where companies already doing business in the Philippines share their own experiences in order to improve the quality of environmental measures.

Participants in these periodic meetings exchange information not only about environmental problems but also other problems in all fields including labor. Both meetings of Japanese executives and of Filipinos are held monthly, and members visit each company if needed. Initial participants included 9 companies but now 15 companies join the meetings as the number of affiliated companies has increased.

A survey of the present status of environmental problems has been conducted since June 1997. In the first stage, the situation of each company is determined based on how the administration deals with the criteria and controls waste water, how it processes solid waste (sludge) and industrial waste, and through questions about the environment in general. Environment conservation measures have been improved by the 15 companies, by reviewing environmental criteria and taking concerted action.

4) Results

The same problems can be swiftly solved and prevented by sharing information with other group companies. Small- and medium-sized companies, which are increasing in the Philippines, find it difficult to allocate money and human resources to environmental problems. However, those companies can utilize correct information based on the local situation by working together with experienced companies that came to the Philippines earlier.

5) Issues for the future

Company F hopes to solve problems swiftly through the meetings and further information exchanges, and to apply the results throughout the Philippines.

Case 7: A Company which Built a Waste Product Incinerator by Taking Advantage of a New Factory Construction

1) Profile of the company

Company G	
Business activities:	Manufacture and sale of automobiles
Number of employees:	Approximately 970
Start of operation:	1983 (a factory in Metropolitan Manila), 1997 (a factory in a suburb of Manila)
Location:	One factory is in Metropolitan Manila, the other is in a suburb of Manila
Ownership ratio of headquarters in Japan: 40 percent	

2) Background

Company G has manufactured automobiles in a factory located in Metropolitan Manila for more than ten years since 1983. Because many houses have been built around the factory and its facilities have become obsolete, the company decided to move its location to a suburb of Manila and build a new factory to increase its production capacity.

The new factory was built in a rural district, a suburb of Manila, where the company purchased farmland, leveled it and developed it itself. The new factory is surrounded by nature and farmland. However, many industrial parks are being developed by major developers around the new factory and Laguna Lake, so countermeasures against water pollution are urgently required.

When planning the construction of the new factory, Company G intends to discharge no various environmental pollutants from the factory. As a part of the plan, a high-performance incinerator will be established on site to burn industrial waste which the previous factory in Metropolitan Manila had buried under ground through subcontracting. Incinerator residue is to be stored in the factory until a reliable waste management system is established. Furthermore, the company is planning to establish the latest waste water treatment facility based on the same concept.

3) Contents

The newly built incinerator was designed and constructed by a Japanese manufacturer mainly for the purpose of burning inflammable solid waste, domestic waste and sludge discharged mainly from paint processing. Features of the incinerator include minimizing smoke and bad odors by adding a third combustion stage to the usual two stages. Its capacity is 360 kg/h and it cost 10 million pesos. This is the first case for this kind of incinerator to be used in a factory in the area around Laguna Lake.

When carrying out this kind of project, it must be noted that even contractors selling environmental equipment such as incinerators do not always understand the environmental standards. There are very few reliable local contractors so equipment and systems depend on imports from Japan, the U.S. and Europe; sufficient lead time

must therefore be allowed when planning to introduce equipment designed to protect the environment.

However, construction work inevitably must be done by local constructors, though there are very few that are capable of putting together a whole system. Company G thus requested Japanese plant manufacturers to integrate the whole system.

Case 8: A Middle-sized Company Tackling Environmental Problems in Various Ways with the Lowest Possible Cost

1) Profile of the company

Company H	
Business activities:	Manufacture of automobile components and plated products
Number of employees:	Approximately 160
Start of operation:	1994
Location:	An industrial park in the Laguna area
Ownership ratio of headquarters in Japan: 100 percent	

2) Background

Company H started into business in the Philippines in 1994 by employing a large and highly-educated workforce recommended by a major automobile manufacturer that was its main customer. In 1996, its headquarters in Japan drew up an environmental policy and action guidelines, and Company H is now preparing to deal efficiently with environmental problems and is constructing an environmental action plan. It is also trying to prevent pollution and reduce the burden on the environment in every manufacturing process. Company H is a middle-sized enterprise that cannot afford environmental measures, therefore a wide variety of measures such as waste water treatment, waste reduction and noise prevention are being taken at as low cost as possible.

3) Contents

The main projects of Company H's on-going environmental measures are as follows:

・Storage and treatment of gilt sludge

At present, sludge generated from gilding processes is not taken out of the factory, but instead is stored in drums due to ambiguities in legal standards concerning waste management. It is planning to halve the sludge amount by dehydration.

・Measures to prevent leakage of agents used in gilding processes

To protect against agents leaking in a gilding process, drainage ways have been built around the gilding facility so that liquids flow into the waste water treatment facility, thus preventing soil contamination. Gilding baths are strictly monitored to prevent leakage of liquid.

・Readjustment of waste material storage

Company H carefully separates various kinds of waste, scrap steel materials and so on that are generated in the factory. In order to prevent rainwater from mixing with waste materials in storage and flowing out, outside storage of open waste materials was discontinued and a garage was built.

・Countermeasures against noise in the power generating room

In order to reduce the noise of diesel engines during the operation of generators, silencers were improved to decrease the noise level by 10 decibels. To protect surrounding plants from hot exhaust from the generators, the angle of exhaust ducts was designed appropriately.

• Recycling treated water

Treated waste water discharged from the gilding process is reused to water plants in the factory. This has reduced water service by five percent. The company is also considering reusing treated waste water in the gilding process.

4) Issues for the future

Company H intends to help employees better understand environmental problems and voluntarily do what they can by informing all employees of the activities that the Environmental Committee has established, and to tackle environmental problems in the company. Individual projects now being carried out will be reviewed and improved upon in the future.

Case 9: Development and Sales of Non-CFC Refrigerators

1) Profile of the company

Company I	
Business activities:	Manufacture and sale of various kinds of electrical consumer goods
Number of employees:	Approximately 4,000
Start of operation:	1967
Location:	Two factories in a suburb of Manila
Ownership ratio of headquarters in Japan: 80 percent	

2) Background

In 1991, the company participated in a seminar concerning the Montreal Protocol that was hosted by the Department of Environment and Natural Resources (DENR) and the United Nations Development Program (UNDP). This seminar made the company reconfirm the urgent need for developing and marketing refrigerators that do not use chloro- or fluorocarbon (CFC) gas as refrigerant. In 1992, it received information on environmental activities and plans for conversion to non-CFC refrigerants for refrigerators from the head office in Japan .

To come to grips with this issue, the company applied to the World Bank for multilateral funding under the Montreal Protocol agreement. However, this application was turned down because Company I was not recognized as a developing-country nationality due to the composition of ownership of its stock (80 percent by the Japanese side and 20 percent by the Philippine side).

Its management made a decision to address the problem squarely even if financial aid had not been extended. In 1993 the Company began preparing a three-year plan for conversion to non-CFC refrigerant. In 1994, it made another application for financial aid in the form of United Nations Office for Project Services (UNOPS) through the Montreal Protocol office of the DENR. At the same time, it established an organization to be in charge of environmental preservation activities.

In November 1995, its application for financial assistance was finally accepted by the UNOPS, and it was decided to extend the company support from the Department of Science and Technology (DOST) of the Philippine government in the form of a favored tax and duty scheme for import of machinery and equipment.

The company brought out the first non-CFC refrigerator in the Philippines in April 1996 and signed the Montreal Protocol agreement with the DENR and UNDP in September .

In 1997, the company completely phased out CFC model sales by making the conversion to non-CFC refrigerant for all models, including OEM (Original Equipment Manufacturers) ones. It also concluded the Memorandum of Agreement (MOA) with the DENR concerning support for the campaign for environmental awareness related to destruction of the ozone layer, to be conducted jointly with the government. The

company's approach to development of non-CFC refrigerators was motivated by a variety of factors, including recognition of the need for environmental preservation, the international schedule for phasing out CFC-12/CFC-11 and the prospects for assistance from government bodies and other international bodies.

There were also some negative opinions within the company about the approach. These included the prospects of a rise in price due to the rise in material costs and investment, increased consumption of electricity by the motor in order to attain the same refrigerating performance, disadvantage in price competition, and the lack of movement toward the conversion among competitors. Some even voiced apprehensions about a reduction of the company's sales volume and shrinkage of its market share as a result. Naturally, there was also worry that consumers were not very interested in the new technology.

3) Contents

The schedule of the three-year conversion plan is as follows:

Step 1: Market survey
Determine how to design the new refrigerator with new technology in order to satisfy market needs and use by the consumer by conducting research into voltage fluctuation, climatic conditions, etc.

Step 2: Personnel training
Training for design of refrigerators to meet local market requirements and acquisition of know-how about the new technology.

Step 3: Design of products, systems, and facilities
Several engineers were dispatched to Japan for training to ensure that products meeting consumer requirements are manufactured at minimum cost.

Step 4: Production of prototypes
Working units utilizing prototype mechanical parts were produced for the purpose of evaluation, testing, and experiment in actual conditions using a chamber with controlled temperature.

Step 5: Evaluation, testing, and simulation
Products were evaluated to ensure that production meets the standards of the parent company in Japan, local standards and consumers.

Step 6: Unit testing
Various tests were carried out continuously for a period equivalent to the life of ordinary refrigerators by simulating actual usage.

Step 7: Life test
The company asked monitors to use prototypes in normal conditions and submit reports periodically.

Step 8: Market test
500 - 1,000 units were produced and sold within specified areas, and feedback from consumers was received after a certain period of usage.

Step 9: Collection and analysis of market feedback
Feedback was collected from the life test and market test, followed by evaluation and analysis to improve product quality and formulate necessary measures.

Step 10: Completion and approval

A report was submitted to management for approval after reconfirming points to be revised in the previous steps.

Step 11: Preparation for facilities
Preparation for manufacturing facilities started before the assembly of prototypes for market testing and was completed after revisions and adjustments were made.

Step 12: Mass production
Full-scale mass production started after management decided that all conditions were satisfied.

Step 13: Product launch (from announcement to sales promotion)
Sales and marketing departments promoted products into the market.

Step 14: Shipment
Products were shipped upon management approval after receiving "shipping certificate" duly signed by the "Quality Assurance Center."

4) Results

The major reasons for acceptance of the product in the market were as follows: 1) rise in refrigerating efficiency by an average of 7 percent, 2) lower consumption of electricity per day, and 3) growing recognition of international technology and environmental problems among the domestic consumers.

As a result,the company achieved a rise in both its sales volume and share of the domestic market. These developments proved acceptance of the new technology by on summers.

Noteworthy points in its approach is that surveying market needs required a lot of time and expense. In evaluation and testing activities, it was difficult to respond to all of the various market needs, such as tests concerning conditions of usage, voltage fluctuation, humidity ratios, and ambient temperature. Furthermore, promotion of the conversion to non-CFC models while producing the conventional models during the transition period had an adverse effect on production efficiency and productivity, and also required an immense investment.

The rise in sales volume and market share provided solid evidence of acceptance in the market. In the second place, the approach enabled a reduction of the environmental impact during manufacture, because the production of non-CFC refrigerators improved the working conditions. In addition, the rise in sales volume and share enabled the results of activities to be quantified.

The increase in the sales volume likewise meant a need for more workers, which enabled the company to achieve its goal of making a contribution to society. Although the conversion also entailed a sharp increase in the amount of input materials consumed, the company was able to offer the non-CFC models to dealers at an average price increase of only 200 pesos, thanks to the improved productivity. However, the profit margin falls far below the target of Company I.

Case 10: A Company that Donated Wells to Local Villages Suffering from Water Shortage

1) Profile of the company

Company J (same as Company D in Case 4)	
Business activities:	Manufacture and sale of automobile parts (transmissions, uniform-speed joints, etc.)
Number of employees:	Approximately 430
Start of operation:	1992
Location:	An industrial park in the Laguna area
Ownership ratio of headquarters in Japan: 95 percent	

2) Background

About 80 percent of the Barangay (the smallest unit of local administration in the Philippines) people suffered from a shortage of water in the villages surrounding Company J's factory due to the large amount of water consumption by nearby industrial facilities. Therefore Company J decided to donate wells. When the president of Company J met the chief of the Barangay, the issue of the water shortage was raised and the president of Company J offered to donate wells. The donation was discussed and determined between the president and the chief of the Barangay.

Company J has had a policy from the outset to offer all kinds of resources (personnel and materials) in order to maintain good relations with and satisfy the needs of the local community.

Wells were donated to two Barangays at a party held in celebration of the shipment of the 500th transmission unit in 1996.

3) Contents

Underground excavation and casing started on March 26, 1996. Excavation was conducted by using a total of six steel pipes, two inches in diameter. On April 3, strengthening of the well foundation with cement started and the well became useable on April 22. The amount of water flow was between 10 and 20 l/minute.

4) Cost

The project cost 20,000 Philippine pesos including labor costs and raw materials.

5) Results

Fresh water became available to almost all residents around this well. The water shortage was not eliminated but mitigated.

Chapter 5: Case Study of the Construction of Environmental Management Systems

In September 1996, the International Organization for Standardization (ISO) issued the international standard ISO 14001 in relation to environmental management systems. In some cases, construction of an environmental management system based on standards and obtaining certification may bring business advantages to international trade. This chapter introduces cases where companies actually constructed environmental management systems. For details of the environmental management system, see Appendix 5.

Case 11: Construction of an Environmental Management System Integrated with the Head Office in Japan

1) Profile of the company

Company K (same as Company E in Case 5)	
Business activities:	Manufacture and sale of automobiles
Number of employees:	Approximately 1,900
Start of operation:	1988 (a factory in Metropolitan Manila), 1997 (a factory in a suburb of Manila)
Location:	One in Metropolitan Manila, the other in a suburb of Manila
Ownership ratio of headquarters in Japan: 40 percent	

2) Background

Company K's previous approach had emphasized waste water treatment. Occasioned by participation in an environmental management seminar hosted by the head office in Japan, however, it reinforced and amplified its approach into a comprehensive one including construction of a total environmental management system (EMS) in response to the increased concern about environmental problems. The system aims at reduction of environmental impact per se.

3) Organization

At Company K, activities related to concern for the environment are under the jurisdiction of the Environmental Control Section of the Plant Engineering Department in the Manufacturing Division.

4) Contents

Company K's approaches to environmental preservation began with its acquisition of permits for the construction and operation of pollution-preventing facilities upon the start of its production operations in 1989. Ever since, it has attached priority to strict observance of environmental standards for waste water.

Full-fledged efforts to construct the EMS were occasioned by the company's participation in the first training seminar for specialists related to environmental management (i.e., the First Environmental Management and Specialist Training Seminar) held by the head office in Japan in 1994. The seminar was staged with the objective of transforming all overseas members of the corporate group into environment-friendly ones. The seminar was followed by close dialogue between the Environmental Management Section of Company K and the Global Environmental Department of the head office, which decided to promote the programs together. At this stage, however, waste water countermeasures was still emphasized.

Thereafter, gradual progress was made, as exemplified by the establishment of Plant Environmental Committee, a company-wide organization headed by the Manufacturing

Division Manager. Although effectiveness was limited due to the lack of clearly defined policy and guidelines at this stage, the movement is beginning to show some results. These include the formulation of plans for environmental efforts and identification of tasks as the objectives for the time being, as well as collection of data on the volume of material consumption, environmental burden, and other such items. Subsequently, it constructed a new Waste Water Treatment Plant (WWTP) Phase I (Chemical Treatment) in 1993 in preparation for the tightening of environment standards relating to waste water in 1995. And in 1994, it constructed WWTP Phase II (Biological Treatment). Thereafter, Company K has been rated highly as one of water-pollution-free company by the Department of Environment and Natural Resources (DENR).

In 1995, Company K sent one Filipino technician to the head office in Japan for training in environmental management. The objective was to acquire the skills needed for taking sure environmental measures and constructing an appropriate EMS on the occasion of the construction of a new plant in southern Manila. The company reported that the importance of environmental measures was recognized as a result of the training, which led to a more positive approach, rather than just waste water treatment.

Subsequent to its participation in the Second Environmental Seminar, which was staged at the Japanese head office in October 1996, Company K decided to redouble its environmental efforts with a view to obtaining ISO 14001 certificate.

The approaches described above were made possible by the initiative and support of the head office. In order to reinforce environmental measures in local factories, the understanding of the head office and the following factors are indispensable: presentation and indication of clear environmental policies as well daily information, receiving of trainees and technical guidance. In the Philippine factories, the local staff members responsible for the operation of not only waste water treatment plants but in each line must understand the importance of tackling environmental problems, and so must be given information and training concerning the environment. This was another key factor for the success.

5) Issues for the future

The immediate agenda items are formulation of environmental guidelines and targets and proper construction and operation of EMS for obtaining ISO 14001 certificate.

Case 12: Establishment of an Environmental Management System and Environmental Targets

1) Profile of the company

Company L	
Business activities:	Manufacture and sale of various kinds of electrical consumer goods
Number of employees:	Approximately 4,000
Start of operation:	1967
Location:	Two factories in a suburb of Manila
Ownership ratio of headquarters in Japan: 80 percent	

2) Background

Electrical consumer good manufacturers faced constructing EMSs in early stages as the percentage of exports among overall sales were comparatively high. The head office in Japan decided that Group companies developing abroad should obtain ISO 14001 certificate, and Company L was one of those companies (although 95 percent of Company L's products were targeted to the domestic market in the Philippines.)

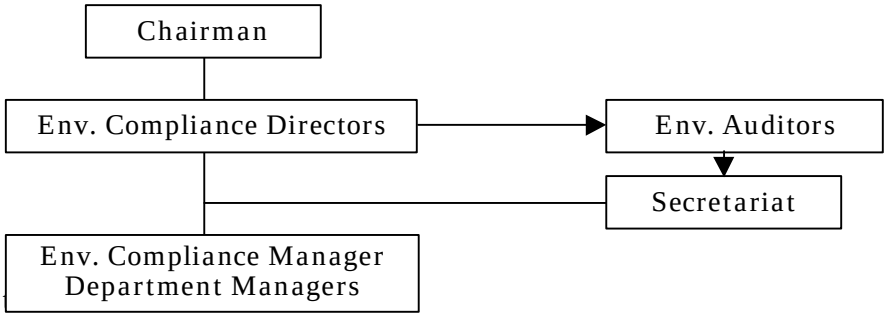
Company L has tackled waste water treatment and other countermeasures against pollution aggressively for a long time.

3) Organization

Although Company L follows overall corporate policies, it is basically an independent corporation from its head office in Japan. The Philippines Environmental Control Committee (PECC) organized by its group companies generalizes approaches to the environmental problems of each group company located in the Philippines. Company L has two factories in the Philippines with ISO 14001 certificate. Working committees, which are in charge of the ISO 14001, are established in both factories. The working committees consist of representatives from on-site divisions and groups in each factory, and provide support for constructing EMS and draw up environmental policies, objectives and targets in compliance with existing national controls, regulations and legislation.

Company L's organization for environmental measures is shown below.

Figure 5-1 Company L's Organization for the Environmental Measures



4) Conten

①Environmental policy

The environmental policy adopted by Company L is as follows:

> Company L subscribes to the corporate goal of environmental protection, thereby committing ourselves to the implementation of the EMS in compliance to existing national rules, regulations and legislation through the continual improvement of our operational control with consideration for the sustainable use of natural resources.

②Environmental targets for 1997

The targets set up for 1997 by Company L are as follows:

· Improvement and rehabilitation of drainage system.
· Improvement and rehabilitation of waste water treatment facilities.
· Implementation of the following voluntary plans:
  - Energy conservation: 5% reduction over 1996 levels
  - Waste minimization: 20% reduction and recycling
  - Water conservation: Recycling of refrigerator production's used water
· Improvement of waste disposal system over 1996 levels.
· EMS establishment: Receipt of ISO 14001 certificate targeted by the end of 1997.
· Environmental awareness for employees and training programs on the development of the EMS: The first seminar was held (in March 1997).

Case 13: Construction of an Environmental Management System for Obtaining ISO 14001

1) Profile of the company

Company M (Same as Company B in Case 2)	
Business activities:	Manufacture and sale of electronic components and products for floppy disk drives and video cassette recorders
Number of employees:	Approximately 1,900
Start of operation:	1987
Location:	In a suburb of Manila
Ownership ratio of headquarters in Japan: 51 percent	

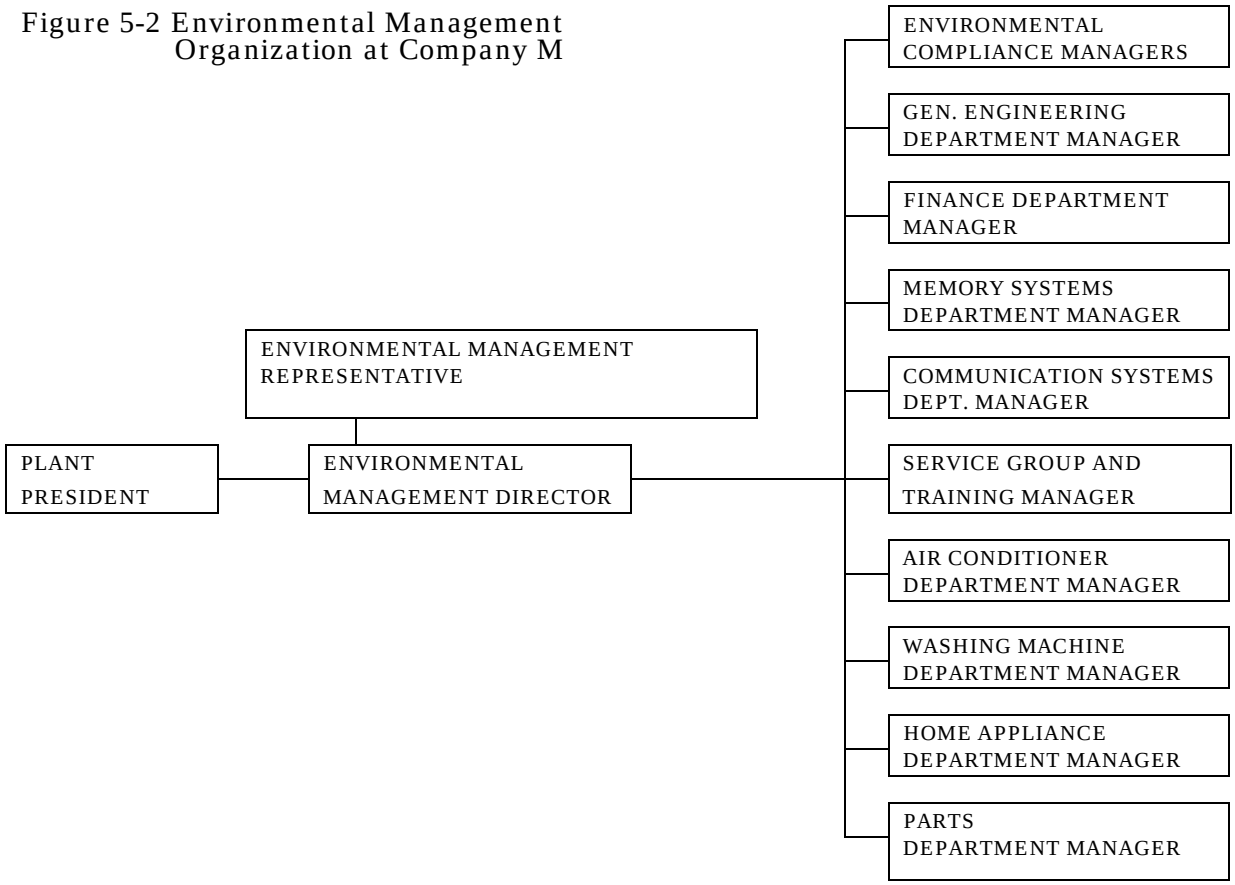
2) Background

The head office in Japan decided that group companies developing products abroad should obtain ISO 14001 certificate, so Company M began to address the requirements in order to obtain certification.

3) Organization

The organization of environmental management at Company M is shown below.

Figure 5-2 Environmental Management Organization at Company M



4) Contents

①Basic policy on the environment

Company M's basic policy on the environment is summarized in the following statement.

Be a company that is environment friendly by promoting the use of earth friendly materials and equipment to ensure manufacturing processes that is in consonance with our objective of protecting our natural environment. In accordance with this basic policy, the following policies should be observed.

- · Satisfaction of ISO 14001 prerequisites through continuous review and improvement of operations, and operation and maintenance of an appropriate EMS
- · Appointment of the General Engineering Department Manager as Environmental Management Representative responsible for operation of the aforementioned EMS
- · Determination of the environmental policy and objectives, and setting of related targets in the early part of each term
- · Notification of the environmental policy and objectives to all employees by such means as training and orientation programs
- · Application of the EMS for satisfaction of legal and social requirements
- · Adoption of the slogan noted below in the interest of constant awareness of the need for environmental protection among all employees

  An environment with:
  - Blue Sky that symbolizes the clean air.
  - Green Tree that symbolizes the clean land.
  - and the Blue Water symbolizes the clean water.

Ultimate responsibility for operation of the EMS described above resides with the company president.

②Management objectives (for fiscal 1997 - 1998)

Company M has determined the following policy, objectives and targets for fiscal 1997 - 1998.

Environmental policy:pursue our commitment to contribute in the preservation of our ecology and natural resources by improving our environmental performance, through the operation of the environmental management system.

Objectives and targets:

1) Control of input materials to lessen its operational impact
   a) Built and update chemical usage database and institute chemical substance control in all departments by September 1997
   b) Reduce electric consumption per unit production by 5 percent per year relative to 1996 in each manufacturing department
2) Control of waste and process discharges to minimize pollution
   a) Reduce waste per unit production by 20 percent relative to 1996 in each

manufacturing department
b) Identify process emissions and institute monitoring programs by September 1997
c) Identify and control other sources of effluents by July 1997

3) Establishment and implementation of an EMS
a) Obtain ISO 14001 certificate by December 1997

5) Issues for the future

As one of the leading companies in the electric equipment industry in the Philippines, Company M strictly observes all laws and regulations related to the environment. In addition, it employs its own system of voluntary control for environmental impact from those processes that are not covered by the existing legislative framework.

Under the influence of the group-level policy on the environment, and for compliance with the environmental laws and regulations in the Philippines, the company has incorporated environmental preservation activities into its production process.

Company M is now introducing an EMS. Once this system is solidly in place, the company will be in a position to aim for not only observance of environmental laws and regulations but also the target of zero emissions, which the head office in Japan aims to attain by the year 2000.

Case 14: Placing Emphasis on Environmental Training for Employees, and Establishing Environmental Management

1) Profile of the company

Company N	
Business activities:	Manufacture and sale of pumps, etc. cast with corrosion-resistant and heat-resistant stainless steel
Number of employees:	Approximately 300
Start of operation:	1991
Location:	In a suburb of Manila
Ownership ratio of headquarters in Japan: 90 percent	

2) Background

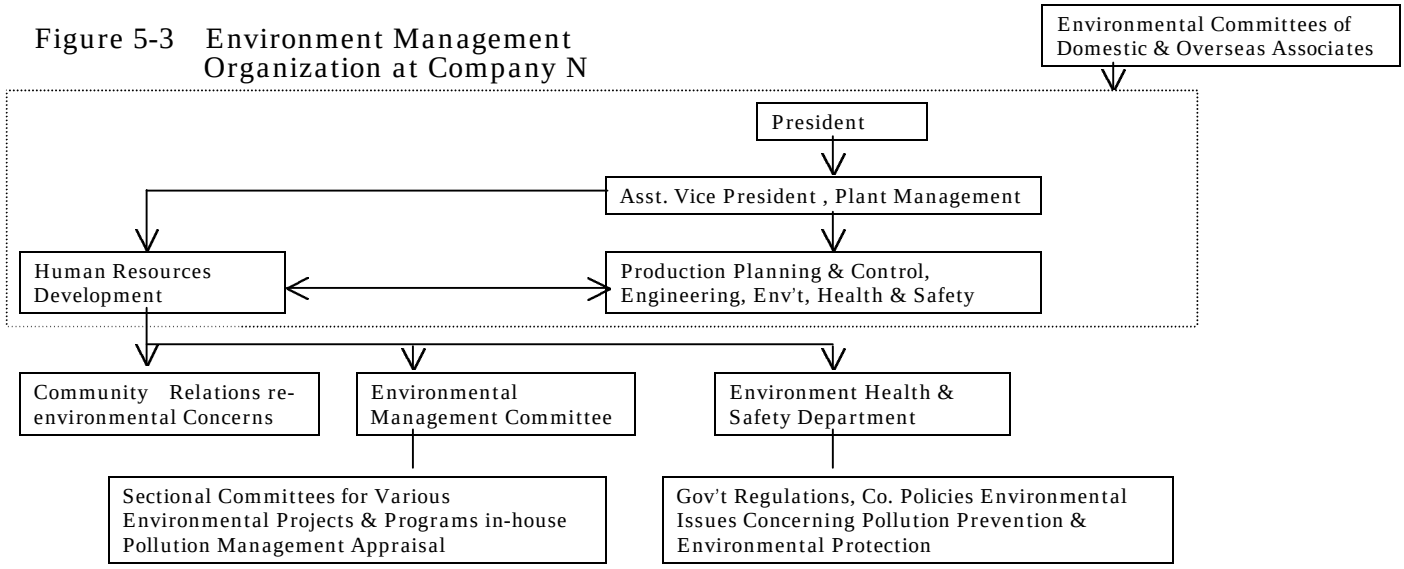
In addition to sales of environment-related equipment and plant manufacturing equipment, the head office of Company N located in Japan, also provides a consulting service for environmental management. Having adopted a complete set of regulations to prevent environmental pollution as a manufacturer and retailer of casting, the company then installed a high-grade plant for treating waste water (both domestic and factory).

Company N was examining the possibility of expanding its environment-related services into the Philippines, but as a pre-requisite, it needed to establish its own effective EMS. Company N set up an Environmental Management Committee (EMC) in December 1994 with the participation of both its manufacturing and non-manufacturing departments. In February 1995, the company drew up an "Environmental Basic Policy" and developed various environmental conservation activities based on the policy. It is working hard to provide environmental education for its employees.

3) Organization

The organization of Company N's EMS is as follows:

Figure 5-3 Environment Management Organization at Company N



4) Contents

①Fundamental environmental policies

· To conduct business operation while maintaining a clean and safe environment.
· To continuously support environment's and management's programs on environmental protection.
· To strictly implement government's environmental laws and regulations.
· To set up an effective EMS and pursue seriously ISO 14001 certificate.
· To promote awareness among all employees and suppliers of their environmental responsibility.

②Environmental training for employees

An environmental calendar has been created by the environmental management committee in order to inform all employees of internal and external information, and of reforms and experiences.

This sets certain environmental targets on a monthly basis, and its objectives are:

· Education about environmental responsibilities and duties for all employees
· References for creating action plans for effective EMS
· Preparation for ISO 14001 certificate
· Implementation of environment-related projects both in-house and the community including employees' families

③Environmental calendar

The contents of the calendar are as follows:

Figure 5-4 Environmental Calendar Compiled by Company N

January	Good housekeeping/5S (adjustment, arrangement, cleaning, neatness, discipline) month
February	"Think health"/Physical fitness month
March	Fire prevention month
April	Preventive maintenance month
May	"Save the River" (SAGIP-ILOG) and community service month
June	Environmental audit month
July	Safety month
August	Pollution prevention month
September	Ecology circles and greening month
October	Enviro-tech month
November	Waste minimization (recycling/reusing) month
December	Resources and energy savings month

The main features of the environmental conservation activities that Company N is involved in are as follows:

① Company policies and reports, pollution control services, all facilities, including waste water treatment plants, and solid waste management, are reported to the public and to

the government to demonstrate the company's commitment to environmental conservation.

② In addition to overall safety, environmental leadership (evaluation of environmental behavior of employees) has been added to the criteria for staff assessment in order to raise environmental awareness among employees.

③ A transition from polluting to non-polluting materials is being made. To protect the ozone layer, the materials used in air conditioners and fire extinguishers will be changed from CFC to non-ozone depleting substances (in 1997). To conserve forests, wooden palettes were changed to plastic palettes, which reduced costs and improved safety and quality. Efforts are also being made to save energy.

④ In order to control solid waste, an experiment to harden sand discarded from a casting process is being carried out. The sale or handling of metal chips and continuous research on appropriate processing methods of solid waste products is being conducted.

⑤ A policy that promotes awareness of environmental responsibilities among the suppliers and surveys their EMS policy in order to meet the standards of Company N.

5) Results

The results of the environmental calendar are as follows:

- Waste minimization, utilization and exchange improved.
- 5S Audit identified companywide.
- No-smoking campaign progressed.
- More data was collected on waste reduction.
- Projects to prevent pollution and reduce waste progressed.

Other results:

- Effluent criteria relating to waste water and emissions could be monitored.
- Awareness of the importance of protecting the environment was enhanced among employees and suppliers and further improvements are expected.
- Reduction and recycling of waste was advanced.

Chapter 6: Forum on Environmental Measures Implemented by Japanese Companies in the Philippines

Environmental policy is a crucial issue that cannot be avoided by Japanese companies starting business in a developing country. Though Japanese companies may intend to implement the same level of environmental protection measures as are taken in Japan, this may be difficult owing to conditions in the target country or differences in national temperament. A discussion was held between several environmental officers from Japanese companies operating in the Philippines so as to promote open discussion of the issues and special circumstances faced in promoting environmental anti-pollution measures in the Philippines as well as the kinds of trouble that have been experienced and efforts that have been made. The contents of the discussion have been organized as follows, under the responsibility of the survey team. The participants were:

- · An environmental officer from an electrical products manufacturer
- · Two environmental officers from automobile makers
- · An environmental officer from a precision parts manufacturer
- · An official from the secretariat of a Japanese organization

1. Environmental Issues Facing Japanese Companies in the Philippines

The following problems have been encountered by the companies participating in the forum in their efforts to implement environmental measures. The two major common issues have been waste water processing and industrial waste processing.

- The company has two plants, one in Metropolitan Manila and one in the suburbs of Manila, where they manufacture electrical products, mainly household appliances. The main measures taken against environmental pollution are water quality pollution measures, industrial waste measures, and air pollution measures. One plant has a coating process, so the company must perform waste water treatment of coatings and water used for washing parts. Waste water treatment is extremely expensive, and the necessary facilities should be installed at the same time as plant construction. This issue must inevitably be addressed since the Philippines has regulations for industrial waste water.
- The company has been operating a plant in an urban area within Metropolitan Manila for more than 10 years. However, this plant, which was formerly used by a US-European auto maker, was acquired without any improvements being made, so the facilities were obsolete. Although the plant used to be on the outskirts of Manila, housing development has progressed since the company started doing business there. As a result, the area is now completely urbanized. Furthermore, the plant is situated in a residential and school district with neighboring schools and hospitals. For this reason, there have been many problems with offensive paint odors. Difficulties have also occurred since the company has no choice but to use comparatively low-level waste water treatment facilities for the plant waste water. There have also been traffic obstacles that interfere with the shipping and receiving of parts and finished products. For this reason, the company recently built a new plant in a province neighboring Metropolitan Manila.

  Based on the experience at the old plant, care was taken at the new plant to avoid annoying neighboring residents. Facilities were installed that can completely process plant waste water, including sewer water. In the past, landfilling of industrial wastes such as waste oil and sludge was entrusted to contractors, but the company has experienced a number of problems caused by irresponsible contractors. A modern incinerator was installed in the new plant in order to reduce the amount of wastes generated by incineration. The incinerator residue is now being stored inside the plant for the present, until a reliable system of disposal can be established.
- The philosophy of the company's founder was to, "take in no pollution and put out no pollution." Starting in the 1970s, the company began to build plating waste water treatment facilities at its overseas plants. Water quality pollution prevention was the mainstay of the company's environmental policy in the Philippines as well, and waste water treatment facilities were installed at great cost. However, there have been problems with the sludge generated along with waste water treatment. At present, this is being hauled away by a contractor, but the company doubts whether this is a satisfactory solution.

  Another aspect is that the company expanded overseas along with many small- and medium-scale affiliated companies. Instead of promoting environmental measures at each company on a small scale, they decided to address these issues as an affiliated (*keiretsu*) group, and the company has been forming activity groups for various environmental measures.
- Surface processing is an indispensable factor in the quality of the manufactured goods.

The hexavalent chromium produced during surface processing must be turned into harmless trivalent chromium. The guideline from the Japanese parent company has been that processing should be done at the same level as in Japan. For this reason, even though the Philippines is somewhat more lenient than Japan since there is no regulation on the overall amount in the Philippines, from the start considerable investment has been made in installing waste water treatment facilities.
The company has also worked to smoothly implement environmental measures that suit the local area. They hired OB of DENR as an environmental consultant to take charge of environmental issues. The company has tackled environmental issues seriously with the goal of anticipating problems, instead of dealing with them after they occur.
Another company in the same area told the company, "We were told by the government to pay a fine of 1,000 pesos a day because the amount of trivalent chromium we are discharging is too large, yet they won't clarify the proper measurement method." The company introduced the other company to an environmental consultant and is helping to find some kind of solution.

2. Clarification of Applicability of Environmental Regulations

The environmental measures taken by these companies center on waste water processing and industrial waste measures. But problems arise in the execution of environmental measures because the environmental regulations of the Bureau are unclear. The details of this situation and the companies' response to it are as follows.

- In an examination of plant waste water processing, it was suddenly pointed out that the value for hexavalent chromium was too high. Up until that time, the waste water had cleared the standard, but the company was notified, "Measured items have been added that were not used up until now. Since you are over the standard, you must pay a fine." The company then sampled the water every hour and entrusted the samples to an outside laboratory for analysis.
- Exactly the same kind of situation occurred at a collaborating maker within the group. The authorities concerned informed them, "The BOD is too high from the coating process waste water. You must pay a fine, but we will not inform you of the measurement method." The company's environmental affairs staff sought advice, and the problem was solved. The company now has a firm review the waste emission standards that have been stipulated by law and is implementing a complete program of measures to deal with them. The company is taking its own measurements, and can answer any questions that may be asked by the authorities. In dealing with the offices that enforce environmental regulations, such as DENR and LLDA, the company still feels uncertain about some points since the measurement methods, for example, are not made public.
- Japanese companies have encountered many problems in the region surrounding Laguna Lake, for example, a company's own measurement results may not be accepted; the measurements must be taken by a government agency. The company's measurements are taken for the purpose of monitoring conditions.
- In past cases, the fine for violating water emissions standards was 1,000 pesos a day, which for a company is not a large expense. But it is certainly not inexpensive when compared to local personnel expenses, in that 10 people can be employed for a total of 1,000 pesos/day (30,000 pesos/month). The amount paid to environmental consultants is 3,000 pesos per month per person.

3. Problems of Industrial Waste Disposal

Along with waste water processing, the other major problem is industrial waste disposal. The following opinions were stated regarding this problem. The general consensus is that it may be best to store wastes inside plants until processing facilities are constructed. According to the participants in the forum, the key problems are that there are no appropriate firms even if waste disposal contract firms are selected using strict criteria, and there are no processing facilities. They are waiting for a Japanese waste processing firm with the proper capabilities to start operations in the Philippines or until the Japanese government provides aid to the Philippine government for construction of such processing facilities.

- Sludge processing was contracted to a waste disposal contractor, but the processing was unsatisfactory. This resulted in complaints from the residents surrounding the landfill site. The company finally changed waste disposal firms, but this experience made the company decide to process wastes in-house.
- Even though a waste disposal firm was contracted to undertake proper processing of the wastes, the firm evaded responsibility when problems occurred at the disposal site. The contractor shifted responsibility to the Japanese company by saying, "The wastes were brought in from such-and-such a company." Although a follow-up (tracing) survey should have been done, circumstances made this difficult. The company had to bear the responsibility for the problem even though it had paid money to the contractor.

4. Employee Education

The following opinions were stated about employee education. The participants pointed out that training of local people is important in every possible respect. The participants were unanimously of the opinion that this will be the fastest way to raise the level of environmental measures in the Philippines.

- Representatives of local employees are sent to Japan for training, since the anti-pollution equipment is made in Japan. These employees are supposed to teach the other employees after returning from Japan, but it was found that education had to start with the reasons why waste water treatment is necessary.
- The reality is that educational problems take a considerable amount of time. It is necessary to educate operators on the manufacturing side that produces the waste, not just the maintenance personnel. There have been cases where poor maintenance of waste water processing facilities led to the standards being exceeded. The causes were insufficient instruction when installing the equipment and improper maintenance. Education must begin with campaigns to teach people to stop littering.
  Seminars are being held for training in-house auditors, since it was decided to obtain ISO 14001 certificate during FY1997 at the direction of the Japanese parent company. One aspect of education is to convey the philosophy behind the ISO 14000 series to all employees.
- A considerable number of people with knowledge of environmental measures have been trained, since the company has been in operation for about 6 years. However, as concern about environmental problems rises, many people have been hired away by other companies. At first this was viewed positively, as something that would be good for the Philippines, but this has become a problem since it has happened repeatedly.
- Employee education on the environment is conducted starting with the local managers.

When it targets the employees as a whole, English instructions on difficult topics may not be understood by all employees. Efforts have been made to use Tagalog.

5. Need for Environmental Efforts to Involve Outside Suppliers

The participants in these discussions are affiliated with so-called big corporations. However, the Japanese companies now entering the Philippines are nearly all small- and medium-scale enterprises (SMEs). Many such companies employ only several dozen employees with one or two Japanese among them. In many cases, these companies are outside suppliers of large corporations. The participants thus indicated that the environmental efforts of large corporations should include outside suppliers.

- At this point in time, the company is making no demands of outside suppliers regarding environmental measures. However, in the future, after the main company obtains ISO 14001 certificate, the company may want to tell the outside suppliers to "follow our example in handling environmental issues, starting with the things you can do now." With worker safety measures, for example, outside suppliers are told, "Install safety equipment to prevent accidents in parts processing. You can't do the job if you haven't installed the safety equipment." In the future, there are plans to have the same kind of requirements regarding the environment.
- One company has an organization of cooperating companies, which at the current time has subcommittees for productivity improvement and safety and hygiene. In the near future, when specialists in environmental issues have been trained at each company, an environmental subcommittee will be established and attempts will be made for all cooperating companies to tackle environmental issues together.
- Another company has few affiliated makers, and the company has received no inquiries about the environment from its customers. However, the company itself must become a model company in the future.
- A third company has an organization of 15 affiliated companies. In this organization, information is exchanged about environmental problems on the same level as for worker hygiene and safety issues. Instructions on the level of “regulate these things" are given to several dozen suppliers, centering on companies in the Philippines. Further appeals have been made, however, and recently there has been considerable improvement. This has also led to improvements in the quality of delivered parts.
- A final company has a full-scale employee education campaign underway at the present time, partly in relation to ISO 14000. It will be difficult to provide support for environmental measures at cooperating companies, however.

6. Company Suggestions regarding Environmental Administration in the Philippines

The companies made the following points regarding improvements that could be made in environmental administration in the Philippines for the future implementation of environmental measures.

- Most of the companies will not object if regulations are strengthened. The Philippines is evidently adopting the strictest aspects of regulations in Japan and the US, but the companies will be able to address environmental issues despite this.
  However, improvements should be made regarding problematic aspects of enforcement of the laws, such as the failure to clarify measurement methods and the sudden

imposition of fines. They would like environmental regulations to be applied fairly, regardless of which country a company is from.

- Fines are instantly levied if a plant exceeds the standards by even a little. However, people find it impossible to walk through the streets without putting handkerchiefs over their mouths, since there is such heavy air pollution. There is a very large gap between industrial standards and other standards. The companies wish that environmental regulation of industry would be enforced in stages, using gradual measures, so that if a problem occurs the company will be told, "You must improve this by such-and-such a time. You will then be fined if you don't." Unless this is done, there will an imbalance with environmental policy in general.
- The cities need to become cleaner. Until they are, employees will not understand the point even if they are told to keep plants clean. It is necessary to make the cities cleaner in order to raise the environmental awareness of the country's people as a whole.
- There is insufficient control of mobile sources of air pollution. Environmental problems can only be solved by improving attitudes throughout the country, instead of just placing demands on companies to obey regulations.
- Unless pollution measures are enforced against old jeepneys and buses, which now have no air pollution regulations, the air will become extremely dirty. A person's nose becomes blackened after only a short walk, and many people have reportedly developed asthma. Such regulations are a must, instead of just imposing regulations on newly-manufactured vehicles. Furthermore, a framework for fines is needed that will lead to a real solution of the problems.

7. Company Suggestions for the Japanese Government

The following suggestions were given regarding measures that could be taken by the Japanese government and parent companies in Japan.

- The parent company in Japan has instructed one company to obtain ISO 14001 certificate. Since the parent company itself is in the midst of efforts to obtain certification at the same time, the parent company is unable to provide the company in the Philippines with instructions on obtaining certification. The company in the Philippines is under pressure and would like to be provided with the latest environmental information, such as by holding seminars with experts from Japan.
- Demands for ODA have reached a bottleneck. Why doesn't the Japanese side make counter-proposals regarding ODA, for which expenditures are limited to the environment? This could lead to inter-administrative negotiations if it were pursued to a significant extent, but how much progress will be made in constructing a basis for environmental measures in this country without it?
- The Philippines has limited funds. Aid may be needed for flue gas desulfurization equipment, which costs hundreds of millions of yen, for example, but we wish more consideration would be given to ways of providing aid so that it would be used more honestly and more efficiently on environmental measures. To raise environmental awareness within the Philippines, aid is also needed to promote environmental education.

8. Promotion of Environmental Measures by Japanese Companies

The discussion produced the following advice to Japanese companies (particularly small- and medium-scale enterprises) that intend to start doing business in the Philippines.

One point that was made by all was, "Basically, it is best to have the intention of using Japanese environmental standards. The regulations in this country will gradually become stricter. The regulations in the Philippines are definitely not lenient." Another commonly-made point was, "The critical thing is to share information and for Japanese companies to unite in solving problems. That is the fastest route to a fair method of solving troubles regarding the environment."

- When constructing a plant, it is important to hold thorough negotiations ahead of time with the regulatory ministries and regulatory companies for electricity, telephones and the like regarding infrastructure matters, not just environmental matters. If you don't you will find it hard to obtain permits, and construction will not proceed.
- Companies should not go into business in the Philippines just to export unpleasant, dirty jobs. If you have the attitude, "This kind of work is hated in Japan, so send it to the Philippines," you won't last. You will just have to move on to another country.
- Environmental awareness is rising in the Philippines today, as has been pointed out by President Ramos himself. Up until now, the Philippines has been regarded as one of the "emerging tigers" of Asia, but now there is talk of becoming a "green tiger." This means that the Philippines should become a country that achieves growth while considering the environment. Even government offices seem to be affected by this trend somewhat, and are slowly moving in that direction.
- Japanese small- and medium-scale enterprises tend to try to solve problems within the company, and put the greatest effort into how things are worded. These companies have a climate in which attempts are made to hide any problems that occur. For example, they would never tell anyone outside the company that they had to pay a fine of 1,000 pesos. However, such information needs to be shared in order to resolve problems in a fair manner. The European and American companies are open about even the smallest details, and they solve problems by pooling information and discussing it together. But in many cases Japanese managers just pay up, thinking that, "As long as nothing happens during my three or five years here, that's all that matters. Having to pay small amounts of money can't be helped."
- A framework for finding solutions through cooperative approaches by Japanese companies is being set up by the Japanese Chamber of Commerce and Industry, so be sure to make use of it.

(Reference)

Officials at LLDA shared their personal opinions in order to provide the following evaluation of the environmental policies of Japanese companies.

Large-scale companies are generally evaluated as forward-looking in their approach to the environment, and as having incorporated environmental management concepts from the standpoint of environmental protection.

However, there is another side to Japanese companies when it comes to small- and medium-scale enterprises and companies that have been in the Philippines for a long time. This is the kind of company that comes to the Philippines with the idea of finding cheap labor or new markets, or with the idea that pollution-related regulations are more lenient than those in Japan. This may have been the situation some 5 or 10 years ago, but today the Philippine government is moving in the direction of tightening regulations to the same level as those in Europe, North America or Japan. It will become more and more

difficult for companies that want to make large profits with a low investment to follow pollution-related standards.

There was a case in 1996, for example, in which a small Japanese company thought it could satisfy the pollution standards with only basic processing of waste water. The company did not buy new waste water treatment equipment from Japan, because they did not have enough money. In the end, though, the company could not meet the standards and was ordered to halt operations twice. The company therefore brought in a new consultant from Japan, and implemented a number of measures including installation of new processing facilities. This was ultimately more expensive than it would have been to implement the same measures from the outset.

There are two levels of Japanese companies in comparison to those from the US, Europe, Korean and Taiwan. On the one level there are the large-scale corporations and on the other there are small- and medium-sized enterprises.

The large corporations are as advanced or even more advanced than US and European companies, and have an extremely high level of environmental awareness. They evidently feel obligated to introduce the latest equipment and to execute the same level of environmental measures in the Philippines as in Japan.

In contrast, it seems that some of the smaller companies tend to hold back on the investments that are needed to lessen the load on the environment, as do some Taiwanese and Korean companies. After all, the very reason these smaller companies entered the Philippines in the first place was to cut costs as much as possible in the midst of international competition. In a certain sense, then, this is inevitable.

Regarding Japanese companies, we hope that only the companies that treat environmental protection with a progressive attitude will survive. We believe that this will be the natural result anyway. Other companies will perish through natural selection. In the future, the world will globalize even more and companies will have no choice but to compete outside of their own countries. At the same time, the same pollution-related regulations may come into force throughout the world.

We have a positive outlook on the environmental policies of Japanese companies. We expect that they will be able to succeed while pursuing both economic development and environmental protection.

Appendix

Appendix 1: Sources of Environmental Information in the Philippines and Japan

1. In the Philippines

(1) Philippine government agencies

1) Implementing agency of pollution control in Metro Manila

・Department of Environmental & Natural Resources

Aaronn II Building, 20 G. Araneta Ave. Extension
Quezon City, Metro Manila Philippines
phone(63-2)712-5278,743-1597
fax(63-2)731-3746

2) Implementing agency of pollution control around the Laguna Lake

・Laguna Lake Development Authority

3rd Floor, Rizal Provincial Capitol Bldg., Shaw Blvd.
Pasig City, Metro Manila Philippines
phone(63-2)635-6680, 631-2587,631-2552
fax(63-2)631-2595

3) Environmental issues in general

・Department of Environment and Natural Resources

Visayas Ave., Diliman
Quezon City, Metro Manila Philippines
phone(63-2)929-6626 to 29, 929-6633 to 35

4) Pollution control in general

・Environmental Management Bureau, DENR

99-101 Topaz Bldg., Kamias Road
Quezon City, Metro Manila Philippines
phone(63-2)926-8745

(2) Japanese government agencies and other institutions

1) Embassy of Japan

2627 Roxas Blvd., Pasay City, Metro Manila 1300 Philippines
（mailing address）P.O. Box 414 Pasay Central Post Office,
Pasay City, MM Philippines
phone(63-2)551-5710
fax(63-2)551-5780

2) JETRO, Manila

23rd Floor, Pacific Star Bldg.,
Sen. Gil J. Puyat Ave. Extension Corner, Makati Ave.
Makati City, Metro Manila, Philippines
phone(63-2)817-6431
fax(63-2)818-7490

3) JICA, Japan International Cooperation Agency Philippines Office

12th Floor, Pacific Star Bldg.,
Sen Gil J. Puyat Ave. Extension Corner, Makati Ave.,
Makati City, Metro Manila Philippines
（mailing address）P.O.Box 1026 Makati Central Post Office,
Makati City, MM Philippines
phone(63-2)893-3081
fax(63-2)816-4222

4) Japanese Chamber of Commerce & Industry in the Philippines, Inc.

6th Fl., Jaycem Bldg., 104 Rada St., Legaspi Village
Makati City, Metro Manila, Philippines
phone(63-2)892-3233
fax(63-2)815-0317

5) Overseas Economic Cooperation Fund, office in Manila

25th Fl., Pacific Star Bldg.,
Sen. Gil J. Puyat Ave. Extension Corner,Makati Ave.,
Makati City, Metro Manila, Philippines
phone(63-2)810-4826
fax(63-2)815-1799

6) Export- Import Bank of Japan, Office in Manila

14th Floor, Pacific Star Bldg.,
Sen. Gil J. Puyat Ave., Extension Corner, Makati Ave.,
Makati City, Metro Manila Philippines
phone(63-2)810-1295 / 1297
fax(63-2)817-3202

2. In Japan

(1) Japanese government agencies and other institutions

1) Office of Overseas Environmental Cooperation, Global Environment Department, Environment Agency of Japan

1-2-2 Kasumigaseki, Chiyoda-ku Tokyo 100 Japan
phone(03)3581-3351
fax(03)3581-3423

2) JETRO

2-2-5 Toranomon, Minato-ku Tokyo 105 Japan
phone(03)3582-5522（PR Division）

3) Overseas Economic Cooperation Fund

1-4-1 Otemachi Chiyoda-ku Tokyo 100 Japan
phone(03)3215-1304

4) Export- Import Bank of Japan

1-4-1 Otemachi, Chiyoda-ku Tokyo 100 Japan

phone(03)3287-9108

5) JICA, Japan International Cooperation Agency

Shinjuku Maynds Tower Bldg., 1-1-2 Yoyogi, Shibuya-ku Tokyo 151 Japan

phone(03)5352-5311～4

6) Institute of Developing Economies

42 Ichigayahonmuracho, Shinjuku-ku Tokyo 162 Japan

phone(03)3353-4231

7) Keidanren, Japan Federation of Economic Organizations

1-9-4 Otemachi, Chiyoda-ku Tokyo 100

phone(03)3279-1411

8) International Division, Japan Chamber of Commerce & Industry

3-2-2 Marunouchi, Chiyoda-ku Tokyo 100 Japan

phone(03)3283-7851

fax(03)3216-6497

9) Tokyo Chamber of Commerce and Industry

3-2-2 Marunouchi, Chiyoda-ku Tokyo 100 Japan

phone(03)3283-7657

fax(03)3283-7633

(2) Philippine government agencies

1) Embassy of the Philippines

11-24 Nanpeidaimachi, Shibuya-ku Tokyo 150 Japan

phone(03)3462-1216

Appendix 2: Environment-related Legislation in the Philippines

PRESIDENTIAL DECREE NO. 1151
PHILIPPINE ENVIRONMENTAL POLICY

Date of promulgation: June 6 1977

WHEREAS, the individual and, at times, conflicting demands of population growth, urbanization, industrial expansion, rapid natural resources utilization and increasing technological advances have resulted in a piece meal approach concept of environmental protection;

WHEREAS, such tunnel-vision concept is not conducive to the attainment of an ideal environmental situation where man and nature can thrive in harmony with one another; and

WHEREAS, there is now an urgent need to formulate an intensive, integrated program of environmental protection that will bring about a concerted effort towards the protection of the entire spectrum of the environment through a requirement of environmental impact assessments and statements;

NOW, THEREFORE, I, FERDINAND E. MARCOS, President of the Philippines, by virtue of the powers vested in me by the Constitution, do hereby order and decree :

SEC. 1. Policy — It is hereby declared as continuing policy of the State (a) to create, develop, maintain and improve conditions under which man and nature can thrive in productive and enjoyable harmony with each other, (b) to fulfill the social, economic and other requirements of present and future generations of Filipino, and (c) to insure the attainment of an environmental quality that is conductive to a life of dignity and well-being.

SEC. 2. Goal — In pursuing this policy, it shall be the responsibility of the Government, in cooperation with concerned private organizations and entities, to use all practicable means, consistent with other essential considerations of national policy, in promoting the general welfare to the end that the Nation may (a) recognize, discharge and fulfill the responsibilities of each generation as trustee and guardian of the environment for succeeding generations, (b) to assure the people of a safe, decent, healthful, productive and aesthetic environment, (c) encourage the widest exploitation of the environment without degrading it, or endangering human life, health and safety or creating conditions adverse to agriculture, commerce and industry, (d) preserve important historic and cultural aspects of the Philippine heritage, (e) attain a rational and orderly balance between population and resource use, and (f) improve the utilization of renewable and non-renewable resources.

SEC. 3. Right to a Healthy Environment — In furtherance of these goals and policies, the Government recognizes the right of the people to a healthy environment. It shall be the duty and responsibility of each individual to contribute to the preservation and enhancement of the Philippine environment.

SEC. 4. Environmental Impact Statement — Pursuant to the above enunciated policies and goals, all agencies and instrumentalities of the national government, including government-owned of controlled corporations, as well as private corporations, firms and entities shall prepare, file and include in every action, project or undertaking which significantly affects the quality of the environment a detailed statement on :

a) the environmental impact of the proposed action, project or undertaking;
b) any adverse environmental effect which cannot be avoided should the proposal be implemented ;
c) alternative to the proposed action;
d) a determination that the short-term uses of the resources of the environment are consistent with the maintenance and enhancement of the long-term productivity of the same; and
e) whenever a proposal involves the use of depletable or nonrenewable resources, a finding must be made that such use and commitment are warranted.

Before an environmental impact statement is issued by a lead agency, all agencies having jurisdiction over, or special expertise on, the subject matter involved shall comment on the draft environmental impact statement made by the lead agency within thirty (30) days from the receipt of the same.

SEC. 5. Agency Guidelines — The different agencies charged with environmental protection as enumerated in Letter of Instruction No. 422 shall sixty (60) days from the effectivity of this Decree, submit to the National Environmental Protection Council (NEPC) , their respective guidelines, rules and regulations to carry out the provisions of Sec. 4 hereof on environmental impact assessments and statements.

SEC. 6. Repealing Clause — All Acts, Presidential Decrees, executive orders, rules and regulations or parts thereof which are inconsistent with the provisions of this Decree are hereby repealed, amended or modified accordingly.

SEC. 7. Effectivity — This Decree shall take effect immediately.

Done in the City of Manila this 6th June in the year of Our Lord, nineteen hundred and seventy-seven.

PRESIDENTIAL DECREE NO. 1152
PHILIPPINE ENVIRONMENT CODE

Date of promulgation: June 6 1977

WHEREAS, the broad spectrum of environment has become a matter of vital concern to the government;

WHEREAS, the national leadership has taken a step towards this direction by creating the National Environment Protection Council under Presidential Decree No. 1121;

WHEREAS, it is necessary that the creation of the Council be complemented with the launching of a comprehensive program of environmental protection and management;

WHEREAS, such a program can assume tangible and meaningful significance only by establishing specific environment management policies and prescribing environment quality standards in a Philippine Environment Code.

NOW, THEREFORE, I, FERDINAND E. MARCOS, President of the Republic of the Philippines, by virtue of the powers vested in me by the Constitution, do hereby order and decree :

SEC. 1. Short Title — This decree shall be known and cited as the "Philippine Environment Code."

TITLE I AIR QUALITY MANAGEMENT

SEC. 2. Purposes — The purposes of this Title are :

a) to achieve and maintain such levels of air quality as to protect public health; and
b) to prevent to the greatest extent practicable, injury and / or damage to plant and animal life and property, and promote the social economic development of the country.

CHAPTER I — STANDARDS

SEC. 3. Ambient Air Quality Standards — There shall be established ambient air quality standards which shall prescribe the maximum concentration of air pollutants permissible in the atmosphere consistent with public health, safety and general welfare.

In the establishment of ambient air quality standards, factors such as local atmospheric conditions, location and land use, and available technology, shall be considered among others.

SEC. 4. National Emission Standards — There shall be established national emission standards for new and existing stationary and mobile sources of pollution which shall

consider among others such factors as type of industry, practicable control technology available, location and land use, and the nature of pollutants emitted.

SEC. 5. Community Noise Standards — Appropriate standards for community noise levels shall be established considering, among others, location, zoning and land use classification.

SEC. 6. Standards for Noise-Producing Equipment — There shall be established a standard for noise-producing equipment such as construction equipment, transportation equipment, stationary engines, and electrical or electronic equipment and such similar equipment or contrivances. The standard shall set a limit on the acceptable level of noise emitted from a given equipment for the protection of public health and welfare, considering among others, the magnitude and condition of use, the degree of noise reduction achievable through the application of best available technology and the cost of compliance.

The installation of any noise-producing equipment shall conform with the requirements of Presidential Decree No. 1096 and other applicable laws as well as their implementing rules and regulations.

SEC. 7. Aircraft Emission and Sonic Booms — Appropriate government agencies shall encourage research studies on the harmful effects of aircraft emissions in the environment in order to establish permissible emission standards.

Research and studies shall also be undertaken to mitigate and / or minimize the effects of sonic booms in the environment.

CHAPTER II — REGULATION AND ENFORCEMENT

SEC. 8. Air Quality and Noise Standards — National Pollution Control Commission in coordination with appropriate government agencies shall be responsible for the enforcement of ambient air quality emission and noise standards, including the monitoring and surveillance of air pollutants, licensing and permitting of air pollution control facilities, and the promulgation of appropriate rules and regulations.

Existing air quality emission and noise standards may be revised and / or modified consistent with new development and technology.

SEC. 9. Aircraft Noise — Community noise standards around airports shall be implemented by the Civil Aeronautics Administration in coordination with the National Pollution Control Commission.

SEC. 10. Vehicular Emission — The Land Transportation Commission, in coordination with the National Pollution Control Commission, shall implement emission standards for vehicles and may deputize other appropriate law enforcement agencies for the purpose.

SEC. 11. Radioactive Emissions — The release and emission of radioactivity into the environment incident to the establishment or possession of nuclear energy facilities and radioactive materials, handling, transport, production, storage, use and disposal of radioactive materials shall be regulated by the Philippine Atomic Energy Commission in coordination with other appropriate government agencies.

CHAPTER III — MONITORING

SEC. 12. Air Quality Monitoring — The National Pollution Control Commission in coordination with appropriate government agencies, shall establish to the greatest extent practicable an air quality monitoring network. Such air quality monitoring network shall put to maximum use the capabilities of these agencies.

The National Environmental Protection Council shall be furnished with the results of air quality monitoring activities.

SEC. 13. Weather Modification — The Philippine Atmospheric, Geophysical and Astronomical Services Administration shall monitor regularly meteorological factors affecting environmental conditions in order to effectively guide air pollution monitoring activities.

Activities relating to weather modification such as rainfall stimulation and storm seeding experiments shall be undertaken in consultation or coordination with the Philippine Atmospheric, Geophysical and Astronomical Services Administration.

TITLE II WATER QUALITY MANAGEMENT

SEC. 14. Purpose — It is the purpose of this Title to prescribe management guidelines aimed to protect and improve the quality of Philippine water resources through :

a) classification of Philippine waters;
b) establishment of water quality standards;
c) protection and improvement of the quality of Philippine water resources; and
d) responsibilities for surveillance and mitigation of pollution incidents.

CHAPTER I — CLASSIFICATION STANDARDS

SEC. 15. Classification of Philippine Waters — The National Pollution Control Commission, in coordination with appropriate government agencies, shall classify Philippine waters, according to their best usage. In classifying said waters, the National Pollution Control Commission shall take into account, among others, the following :

a) the existing quality of the body of water at the time of classification;
b) the size, depth, surface area covered, volume, direction, rate of flow, gradient of stream; and

c) the most beneficial uses of said bodies of water and lands bordering them for residential, agricultural, commercial, industrial, navigational, recreational, and aesthetic purposes.

SEC. 16. Reclassification of Waters Based on Intended Beneficial Use — Where the public interest so requires, the National Pollution Control Commission, in coordination with appropriate government agencies, shall reclassify a body of water based on the intended beneficial use and take such steps as may be necessary to upgrade the quality of said water. Other government agencies may adopt higher standards for a particular body of water, subject to the approval of the National Pollution Control Commission.

SEC. 17. Upgrading of Water Quality — Where the quality of water has deteriorated to a degree where its state will adversely affect its best usage, the government agencies concerned shall take such measures as may be necessary to upgrade the quality of such water to meet the prescribed water quality standards.

SEC. 18. Water Quality Standards — The National Pollution Control Commission shall prescribe quality and effluent standards consistent with the guidelines by the National Environmental Protection Council and the classification of waters prescribed in the preceding sections, taking into consideration, among others, the following :

a) the standard of water quality or purity may vary according to beneficial uses; and
b) the technology relating to water pollution control.

CHAPTER II — PROTECTION AND IMPROVEMENT OF WATER QUALITY

SEC. 19. Enforcement and Coordination — The production, utilization, storage and distribution of hazardous, toxic and other substances such as radioactive materials, heavy metals, pesticides, fertilizers, and oils, and disposals, discharge and dumping of untreated wastewater, mine- tailings and other substances that may pollute any body of water of the Philippines resulting from normal operations of industries, water-borne sources, and other human activities, as well as those resulting from accidental spills and discharges shall be regulated by appropriate government agencies pursuant to their respective charters and enabling legislations. In the performance of the above functions, the government agencies concerned shall coordinate with the National Environmental Protection Council and furnish the latter with such information as may be necessary to enable it to attain its objectives under Presidential Decree 1121.

SEC. 20. Clean-up Operations — It shall be the responsibility of the polluter to contain, remove and clean-up water pollution incidents at his own expense. In case of his failure to do so, the government agencies concerned shall undertake containment, removal and clean-up operations and expenses incurred in said operations shall be charged against the persons and/or entities responsible for such pollution.

SEC. 21. Water Quality Monitoring and Surveillance — The various government agencies concerned with environmental protection shall establish to the greatest extent

practicable a water quality surveillance and monitoring network with sufficient stations and sampling schedules to meet the needs of country. Said water quality surveillance network shall put to maximum use the capabilities of such government agencies. Each agencies involved in such network shall report to the National Environment Protection Council the results of these monitoring activities as the need arises.

TITLE III LAND USE MANAGEMENT

SEC. 22. Purposes — The purposes of this Title are :

a) to provide a rational, orderly and efficient acquisition, utilization and disposition of land and its resources in order to derive therefrom maximum benefits; and
b) to encourage the prudent use and conservation of land resources in order to prevent an imbalance between the nation's needs and such resources.

SEC. 23. National Land Use Scheme — The Human Settlements Commission, in coordination with the appropriate agencies of the government, shall formulate and recommend to the National Environmental Protection Council a land use scheme consistent with the purpose of this Title.

The Land Use Scheme shall include, among others, the following :

a) a science-based and technology-oriented land inventory and classification system;
b) a determination of present land uses, the extent to which they are utilized, under-utilized, rendered idle or abandoned;
c) a comprehensive and accurate determination of the adaptability of the land for community development, agriculture, industry, commerce, and other fields of endeavor;
d) a method of identification of areas where uncontrolled development could result in irreparable damage to important historic, or aesthetic values, or nature systems or processes of national significance;
e) a method for exercising control by the appropriate government agencies over the use of land in area of critical environmental concern and areas impacted by public facilities including, but not limited to, airports, highways, bridges, ports and wharves, buildings and other infrastructure projects;
f) a method to ensure the consideration of regional development and land use in local regulations;
g) a policy for influencing the location of new communities and methods for assuring appropriate controls over the use of land around new communities;
h) a system of controls and regulations pertaining to areas and development activities designed to ensure that any source of pollution will not be located where it would result in a violation of any applicable environmental pollution control regulations; and
i) a recommended method for the periodic revisions and updating of the national land use scheme to meet changing conditions.

SEC. 24. Location of Industries — In the location of industries, factories, plants, depots and similar industrial establishments, the regulating or enforcing agencies of the government shall take into consideration the social, economic, geographic and significant environmental impact of said establishments.

TITLE IV NATURAL RESOURCES MANAGEMENT AND CONSERVATION

SEC. 25. Purposes — The purposes of this Title are :

a) to provide the basics on the management and conservation of the country's natural resources to obtain the optimum benefits therefrom and to preserve the same for the future generations; and
b) to provide general measures through which the aforesaid policy may be carried out effectively.

CHAPTER I — FISHERY AND AQUATIC RESOURCES

SEC. 26. Management Policy — The National government, through the Department of Natural Resources, shall establish a system of rational exploitation of fisheries and aquatic resources within the Philippine territory and shall encourage citizen participation therein to maintain and/or enhance the optimum and continuous productivity of the same.

SEC. 27. Measures for Rational Exploitation — Measures for the rational exploitation of fisheries and other aquatic resources may include, but shall not be limited to, the following :

a) undertaking manpower and expertise development ;
b) acquiring the necessary facilities and equipment ;
c) regulating the marketing of threatened species of fish or other aquatic resources;
d) reviewing all existing rules and regulations on the exploitation of fisheries and aquatic resources with a view to formulating guidelines for the systematic and effective enforcement thereof ; and
e) conserving the vanishing species of fish and aquatic resources such as turtles, sea snakes, crocodiles, corals, as well as maintaining the mangrove areas, marshes and inland areas, coral reef areas and islands serving as sanctuaries for fish and other aquatic life.

CHAPTER II — WILDLIFE

SEC. 28. Management Policy — The National government, through the Department of Natural Resources, shall establish a system of rational exploitation and conservation of wildlife resources and shall encourage citizen participation in the maintenance and / or enhancement of their continuous productivity.

SEC. 29. Measures for Rational Exploitation — Measures for rational exploitation of wildlife resources may include, but shall not be limited to, the following :

a) regulating the marketing of threatened wildlife resources;
b) reviewing all existing rules and regulations on the exploitation of wildlife resources with a view of formulating guidelines for the systematic and effective enforcement thereof; and
c) conserving the threatened species of fauna, increasing their rate of production, maintaining their original habitat, habitat manipulation, determining limits, population control in relation to the carrying capacity of any given area, banning of indiscriminate and/or destructive means of catching or hunting them.

CHAPTER III — FORESTRY AND SOIL CONSERVATION

SEC. 30. Management Policy for Forestry — The National government, through the Department of Natural Resources shall undertake a system of rational exploitation of forest resources and shall encourage citizen participation therein to keep the country's forest resources at maximum productivity at all times.

SEC. 31. Measures for Rational Exploitation of Forest Resources — Measures for the rational exploitation of forest resources may include, but shall not be limited to, the following :

a) regulating the marketing of threatened forest resources;
b) reviewing all existing rules and regulations on the exploitation of forest resources with a view of formulating guidelines for the systematic and efficient enforcement thereof;
c) conserving threatened species of flora as well as increasing their rate of propagation; the banning of destructive modes of exploitation, kaingin making or shifting cultivation, indiscriminate harvesting of minor forest products, the recycling methods of waste materials; and
d) carrying out a continuing effort on reforestation; timber stand improvement; forest protection; land classification; forest occupancy management; agri-silviculture; range management; agri-silvicultural / kaingin management; multiple use forest; timber management; and forest research.

SEC. 32. Management Policy on Soil Conservation — The National government, through the Department of Natural Resources and the Department of Agriculture, shall likewise undertake a soil conservation program including therein the identification and protection of critical watershed areas, encouragement of scientific farming techniques, physical and biological means of soil conservation, and short-term and long-term researches and technology for effective soil conservation.

SEC. 33. Use of Fertilizers and Pesticides — The use of fertilizers and pesticides in agriculture shall be regulated, prescribing therefor a tolerance level in their use. Their

use shall be monitored by appropriate government agencies to provide empirical data for effective regulation.

CHAPTER IV — FLOOD CONTROL AND NATURAL CALAMITIES

SEC. 34. Measures in Flood Control Program — In addition to the pertinent provisions of existing laws, the following shall be included in a soil erosion, sediment and flood control program :

a) the control of soil erosion on the banks of rivers, the shores of lakes and the sea-shores;
b) the control of flow and flooding in and from rivers and lakes;
c) the conservation of water which, for purposes of this Section shall mean forms of water, but shall not include captive water;
d) the needs of fisheries and wildlife and all other recreational uses of natural water ;
e) measures to control the damming, diversion, taking, and use of natural water, so far as any such act may affect the quality and availability of natural water for other purposes; and
f) measures to stimulate research in matters relating to natural water and soil conservation and the application of knowledge thereby acquired.

SEC. 35. Measures to Mitigate Destructive Effects of Calamities — The national government, through the Philippine Atmospheric, Geophysical and Astronomical Services Administration, shall promote intensified and concerted research efforts on weather modification, typhoon, earthquake, tsunami, storm surge, and other tropical natural phenomena in order to bring about any significant effect to mitigate or prevent their destructive effects.

CHAPTER V — ENERGY DEVELOPMENT

SEC. 36. Policy — Consistent with the environmental protection policies, the national government, through the Energy Development Board, shall undertake an energy development program encouraging therein the utilization of invariant sources such as solar, wind and tidal energy.

SEC. 37. Measures for Energy Development — Measures for energy development program may include, but shall not be limited to, the following :

a) setting up pilot plants utilizing invariant sources of energy;
b) training of technical personnel for purposes of energy development; and
c) conducting researches aimed at developing technology for energy development.

SEC. 38. Safety Measures on Energy Development — Rules and regulations shall be promulgated to prevent or mitigate the adverse effects of energy development on the environment. For this purpose, all nuclear powered plants and plants exploring and

utilizing geothermal energy, whether owned or controlled by private or government entities shall:

a) observe internationally accepted standards of safety; and
b) provide safety devises to ensure the health and welfare of their personnel as well as the surrounding community.

CHAPTER VI — CONSERVATION AND UTILIZATION OF SURFACE GROUND WATERS

SEC. 39. Management Policy — In addition to existing laws, the national government through the National Water Resources Council in coordination with other appropriate government agencies, shall prescribe measures for the conservation and improvement of the quality of Philippine water resources and provide for the prevention, control and abatement of water pollution.

CHAPTER VII — MINERAL RESOURCES

SEC. 40. Management Policy — The national government, through the Department of Natural Resources, shall undertake a system of gainful exploitation and rational and efficient utilization of mineral resources and shall encourage citizen participation in this endeavor.

SEC. 41. Measures for Exploitation and Utilization of Mineral Resources — Measures for the gainful exploitation and rational and efficient utilization of such mineral resources may include, but shall not be limited to, the following :

a) increasing research and development in mineral resources technology;
b) training of additional technical manpower needed in geology, geophysics, mining engineering, and related fields;
c) regulating the exploitation of identified mineral reserves;
d) accelerating the exploitation of undiscovered mineral deposits; and
e) encouraging the establishment of processing plants for refined metal.

TITLE V WASTE MANAGEMENT

SEC. 42. Purposes — The purposes of this Title are :

a) to set guidelines for waste management with a view to ensuring its effectiveness;
b) to encourage, promote and stimulate technological, educational, economic and social efforts to prevent environmental damage and unnecessary loss of valuable resources of the nation through recovery, recycling and reuse of wastes and waste products; and
c) to provide measures to guide and encourage appropriate government agencies in establishing sound, efficient, comprehensive and effective waste management.

CHAPTER I — ENFORCEMENT AND GUIDELINES

SEC. 43. Waste Management Programs — Preparation and implementation of waste management programs shall be required for all provinces, cities and municipalities. The Department of Local Government and Community Development shall promulgate guidelines for the formulation and establishment of waste management program.

Every waste management program shall include the following :

a) an orderly system of operation consistent with the needs of the area concerned;
b) a provision that the operation will not create pollution of any kind or will constitute public nuisance;
c) a system for safe and sanitary disposal of waste;
d) a provision that existing plans affecting the development, use and protection of air, water or natural resources shall be considered;
e) schedules and methods of implementing the development, construction and operation of the plan together with the estimated costs; and
f) a provision for the periodic revision of the program to ensure its effective implementation.

SEC. 44. Responsibility of Local Government — Each province, city or municipality shall provide measures to facilitate collection, transportation, processing and disposal of waste within its jurisdiction in coordination with other government agencies concerned. For this purpose, the national government shall provide the necessary subsidy to local governments upon request made through the National Environmental Protection Council and subject to such terms and conditions as the latter may provide.

CHAPTER II - METHODS OF SOLID WASTE DISPOSAL

SEC. 45. Solid Waste Disposal — Solid waste disposal shall be by sanitary landfill, incineration, composting, and other methods as may be approved by competent government authority.

SEC. 46. Sanitary Landfills — Local governments, including private individuals, corporations or organizations may operate or propose to operate one or more sanitary landfills. An entity proposing to operate a sanitary landfill shall submit to the appropriate government agency an operational work plan showing, among other things, a map of the proposed work location, disposal areas for rubbish, garbage, refuse and other waste matter; and the equipment or machinery needed to accomplish its operations. In no case shall land-fill or work locations under this Section be located along any shore or coast-line, or along the banks of rivers and streams, lakes, throughout their entire length, in violation of any existing rules and regulations.

SEC. 47. Incineration and Composting Plants — The installation and establishment of incineration or composting plants, or the alteration/modification of any part thereof shall

be regulated by the local governments concerned in coordination with the National Pollution Control Commission.

SEC. 48. Disposal Sites — The location of solid waste disposal sites shall conform with existing zoning, land use standards, and pollution control regulations.

SEC. 49. Dumping into the Sea and Other Navigable Waters — The dumping or disposal of solid wastes into the sea and any body of water in the Philippines, including shore-lines and river banks, where the wastes are likely to be washed into the water is prohibited. However, dumping of solid wastes or other materials into the sea or any navigable waters shall be permitted in case of immediate or imminent danger to life and property, subject to the rules and regulations of the Philippine Coast Guard and the National Pollution Control Commission.

Government agencies and private entities which are undertaking solid waste management programs shall make consultations with the government agencies concerned with respect to the effects of such dumping to the marine environment and navigation.

CHAPTER III — METHODS OF LIQUID WASTE DISPOSAL

SEC. 50. Liquid Waste Disposal — Wastewater from manufacturing plants, industries, community, or domestic sources shall be treated either physically, biologically or chemically prior to disposal in accordance with the rules and regulations promulgated by proper government authority.

SEC. 51. Applicability of Sec. 49 — The provisions of Sec. 49 hereof shall likewise apply to the dumping or disposal of liquid waste into the sea and other bodies of water.

TITLE VI MISCELLANEOUS PROVISIONS

SEC. 52. Population Environment Balance — In the assessment of development projects, the National Environmental Protection Council, hereinafter referred to in this Title as the Council, shall take into consideration their effect on population with a view to achieving a rational and orderly balance between man and his environment.

SEC. 53. Environment Education — The Department of Education and Culture shall integrate subjects on environmental education in its school curricula at all levels. It shall also endeavor to conduct special community education emphasizing the relationship of man and nature as well as environmental sanitation and practices.

The Council and other government agencies implementing environmental protection laws in coordination with public information agencies of the government shall undertake public information activities for the purpose of stimulating awareness and encouraging involvement in environmental protection.

SEC. 54. Environmental Research — The Council shall undertake and/or promote continuing studies and research programs on environmental management and shall, from time to time, determine priority areas of environmental research.

SEC. 55. Monitoring and Dissemination of Environmental Information of Foreign Origin — The Council shall keep itself informed of current environmental developments by obtaining information and literature from foreign sources through the Department of Foreign Affairs, government agencies and other entities, both domestic and foreign. Such information and literature shall be given the widest dissemination possible.

SEC. 56. Incentive — To operate the installation and the utilization of pollution control facilities, the following incentives are hereby granted :

a) exemption to the extent of fifty (50) percent of tariff duties and compensating tax for importation of pollution control equipment, devices, spare parts and accessories for a period of five (5) years from the effectivity of this Decree subject to the conditions that will be imposed by the Council.
b) a tax credit equivalent of fifty (50) percent of the value of the compensating tax and tariff duties that would have been paid on the pollution control equipment, devices, spare parts and accessories had these items been imported shall, within a period of seven (7) years from the effectivity of this Decree, be given to the person or firm who or which purchases them from a domestic manufacturer, and another tax credit equivalent to twenty-five (25) percent thereof shall be given to said manufacturer, subject to such conditions as may be imposed by the Council; and
c) deductions equivalent to fifty (50) percent of the expenses actually incurred on research projects undertaken to develop technologies for the manufacture of pollution control equivalent which have been proven effective and commercially reproducible, from the taxable income of the person or firm actually undertaking such projects subject to the conditions that may be imposed by the Council.

The pollution control equipment, devices, spare parts and accessories acquired under this Section shall not be sold, transferred or disposed within five (5) years from the date of acquisition without the prior approval of the Council otherwise the importer or purchaser shall pay twice the amount of the tax exemption or tax credit granted.

SEC. 57. Financial Assistance/Grant — Financial assistance/grant for the study, design and construction of environmental protection facilities especially for waste disposal in favor of cities, municipalities, small and medium scale industries may be granted on a case-to-case basis subject to such conditions as may be imposed by the Council.

SEC. 58. Participation of Local Government Units and Private Individuals — It shall be the responsibility of local government units as well as private individuals to actively participate in the environmental management and protection programs of the government.

SEC. 59. Preservation of Historic and Cultural Resources and Heritage — It shall be the duty of every person to help preserve the historic and cultural resources of the country such as sites, structures, artifacts, documents, objects, memorials, and priceless trees.

SEC. 60. Government Offices Performing Environmental Protection Functions — Government agencies vested by laws to exercise environmental management powers, shall continue to function as such within their respective jurisdictions. The Council may, however, in the exercise of its powers and functions under Presidential Decree No. 1121, inquire into any action or issue of environmental significance.

SEC. 61. Public Hearings — The Council may, whenever it deems necessary, conduct public hearings on issue of environmental significance.

SEC. 62. Definition of Terms — As used in this Code.

a) Ambient Air Quality means the average atmospheric purity as distinguished from discharge measurements taken at the source of pollution. It is the general amount of pollution present in a broad area.
b) Emission means the act of passing into the atmosphere an air contaminant, pollutant, gas stream and unwanted sound from a known source.
c) Water Quality means the characteristics of water which define its use in terms of physical, chemical, and biological contents; hence, the quality of water for domestic use is different from industrial use.
d) Water Quality Surveillance means a close and continuous supervision of the water quality to detect development, movement, or charges in the characteristics of the water.
e) Water Quality Standard means a plan that is established by governmental authority as a program for water pollution prevention and abatement. Such standard may include water classification and the criteria to support the uses of the water.
f) Effluent Standards means restrictions established to limit levels of concentration of physical, chemical, and biological constituents which are discharged from point sources.
g) Clean-Up Operations refers to activities conducted in removing the pollutants discharged or spilled in water to restore it to pre-spill condition.
h) Accidental Spills refers to spills of oil or other hazardous substances in water that result from accidents such as collisions and groundings.
i) Areas of Critical Environmental Concern are areas where uncontrolled development could result in irreparable damage to important historic, cultural, or aesthetic values or natural systems or processes of national significance.
j) Hazardous Substances means elements or compounds which when discharged in any quantity present imminent or substantial danger to public health and welfare.
k) Areas Impacted by Public Facilities refers to areas where the introduction of public facilities may tend to induce development and urbanization of more than local significance or impact.

l) Environmental Impact is the alteration, to any degree, of environmental conditions or the creation of a new set of environmental conditions, adverse or beneficial, to be induced or caused by a proposed project.

m) Government Agencies refers to national, local and regional agencies and instrumentalities including government-owned or controlled corporations.

TITLE VII FINAL PROVISIONS

SEC. 63. Separability of Provisions — If any provision of this Code, or the application of such provisions to any person or circumstance, is declared unconstitutional, the remainder of the Code or the application of such provisions to other persons or circumstances shall not be affected by such declaration.

SEC. 64. Effectivity — This Code shall take effect upon its approval.

Done in the City of Manila, this 6th day of June in the year of Our Lord, Nineteen hundred and seventy-seven.

Appendix 3: Current Status of Environmental Policies of Japanese Companies in Asia, including the Philippines

1. Overview of the Survey

In 1995, questionnaire and interview surveys were conducted on Japanese companies doing business in four Asian countries (the Philippines, Thailand, Indonesia and Malaysia) with the cooperation of Japanese Chamber of Commerce and Industry in the respective countries. The purpose of the surveys was to gather information on what environmental considerations were being taken by Japanese companies overseas.

Based on membership lists, the questionnaire was sent out to corporate members (excluding individual and organizational members) of the Japanese Chamber of Commerce and Industry in the four nations, which totaled 2,070 companies, including non-manufacturing companies and small-scale local representative offices. Of them, 425 replies were returned (return rate of 20.5%).

In the survey, questionnaires were sent to 274 companies in the Philippines, and replies were received from 75. The return rate was 27.4%.

The results of the survey are summarized below, while comparing the status of environmental policies of Japanese companies in the Philippines with average data for the other three Asian countries (350 replies).

The breakdown of replies by business sector is as follows: manufacturing - 57.3% (67.1% in the other three Asian countries; hereafter, figures in parentheses refer to average data for these countries) and non-manufacturing (construction, retail, finance, insurance, etc.) - 38.7% (29.7%). As for the number of employees, 48.0% (27.7%) had fewer than 100, 26.7% (33.1%) had 100 or more employees but less than 500 and 17.3% (20.6%) had 1,000 employees or over. More than 70% (60%) of the total were companies with fewer than 500 employees. This percentage was especially high in the Philippines.

2. Survey Results

(1) Environmental measures taken when initially locating business

In preparation for starting business operation in the host country, only 33.3% (27.7%) of the companies were legally obliged to conduct environmental assessment (Fig. 1) but 45.4% (46.3%) had actually conducted environmental assessment (Fig. 2), meaning that a far larger number than compulsory took this action. (34.7% (29.7%) had conducted environmental assessment in accordance with local legislation, etc.; 10.7% (16.6%) had voluntarily conducted independent assessment.)

Figure 1 Was Environmental Assessment Legally Obligatory?

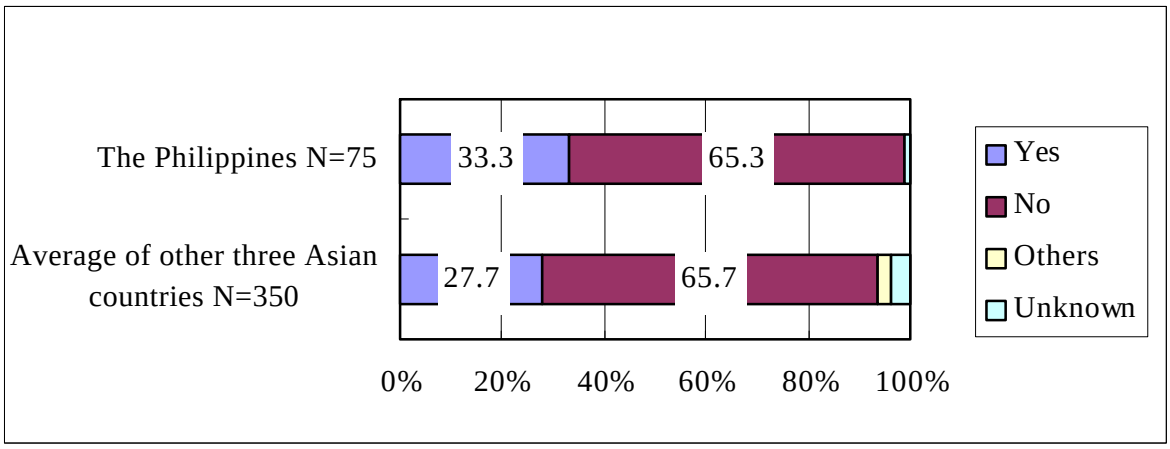
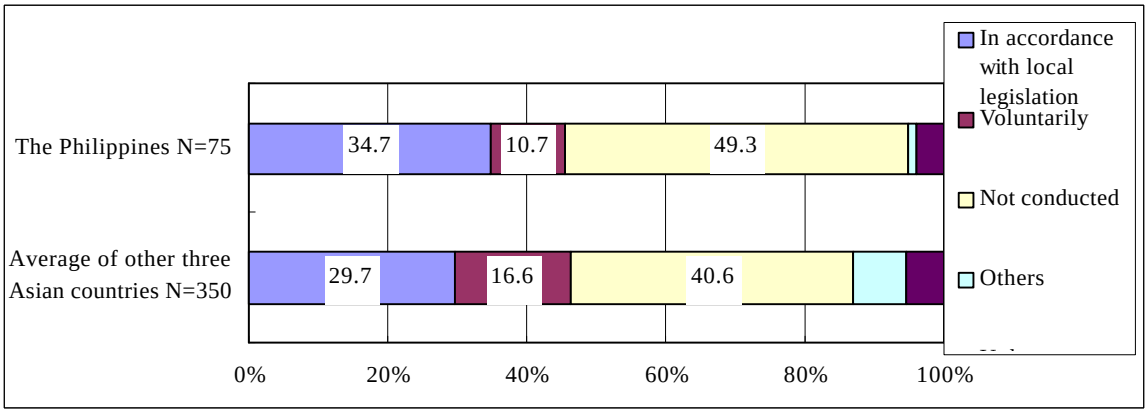


Figure 2 How Environment Assessment Is Conducted?



(2) Systems and organizations for promoting environmental measures

26.7% (30.6%) of the companies were familiar with the Japanese Environment Agency's Environment Friendly Corporate Activities Guideline; 29.3% (26.9%) were familiar with the Keidanren Global Environment Charter (Fig. 3, multiple answers); 52.0% (53.4%) already have instituted or are preparing to institute a total in-house management policy on environmental issues (Fig. 4).

48.0% (52.0%) of the companies have sections or personnel responsible for environmental issues (Fig. 5). (14.7% (10.3%) had specialist sections; 4.0% (4.3%) had specialist staff; 29.3% (37.4%) had staff with combined responsibilities.)

Figure 3 Percentage of Recognition of Guidelines and Charters (Each Company Replies to All Items)

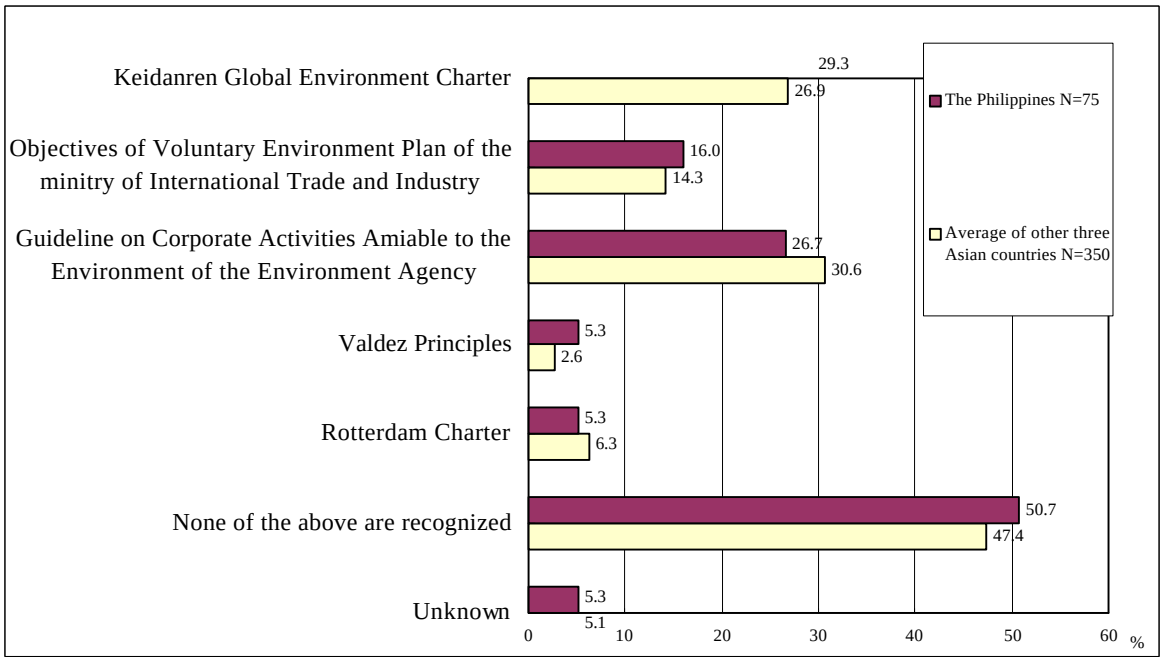


Figure 4 Is Management Policy on Environmental Issues Instituted?

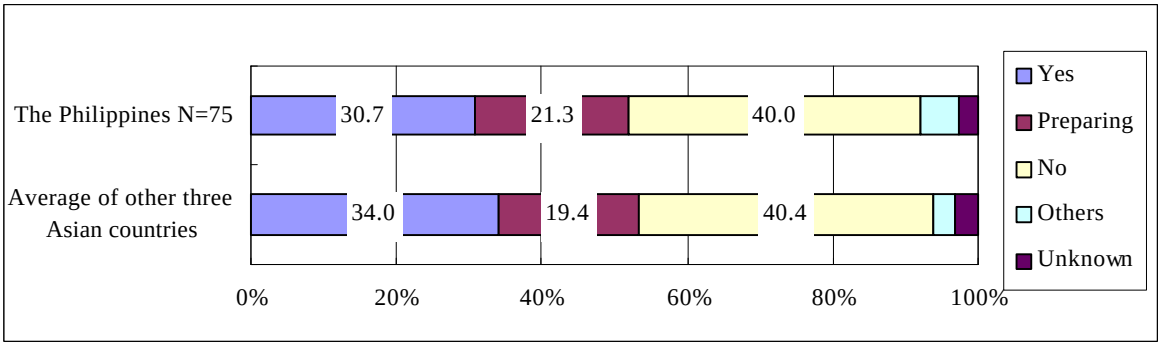
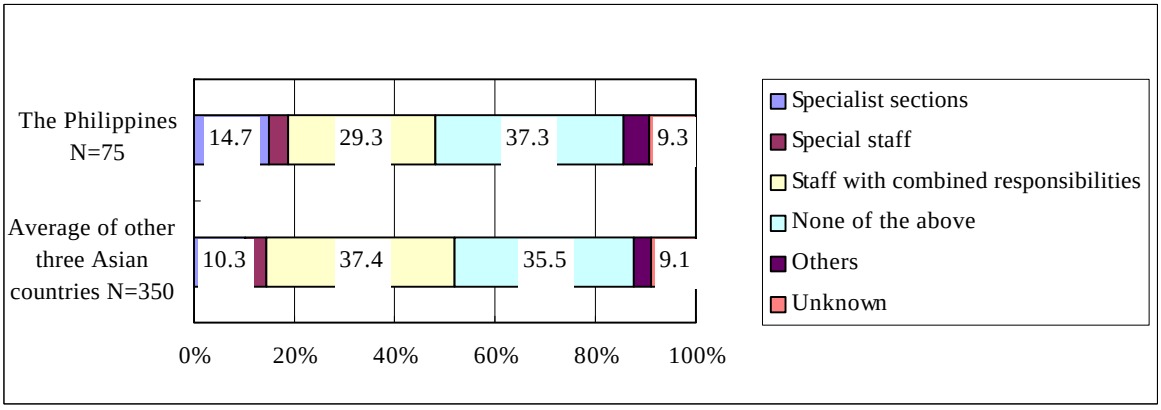


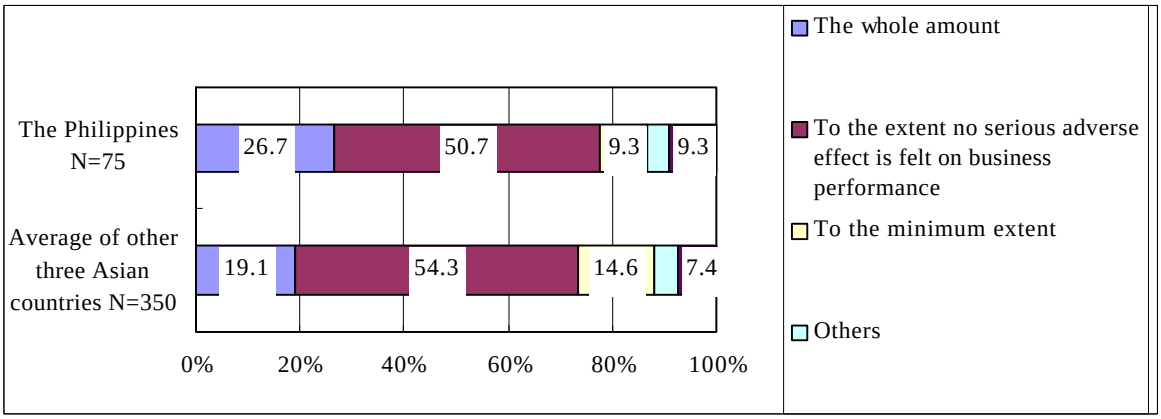
Figure 5 Sections or Personnel Responsible for Environmental Issues



(3) Environmentally conscious business activities

77.4% (73.4%) of the companies are willing to spend money or make investments in order to protect the environment, over and above the minimum necessary to observe existing regulations (Fig. 6). (26.7% (19.1%) intend to bear costs regardless of business performance; 50.7% (54.3%) intend to make expenditure as much as possible so long as no serious adverse effect is felt on business performance.)

Figure 6 Extent of Environmental Conservation Expense to be Born



(4) Environment-related issues arising at the time of start-up in the host country

32.0% (37.1%) of the companies were subject to local government regulations concerning air pollution, water pollution, etc. (Fig. 7).

21.3% (28.3%) submit measurement results on air or water quality to local administrative bodies, etc. (Fig. 8). (17.3% (22.3%) report readings as required by law; 4.0% (6.0%) report voluntarily; 17.3% (24.0%) are inspected regularly as required by law.)

13.4% (21.2%) of the companies experienced some types of environmental problems at the time of start-up of local operation, including problems that did not affect anything outside the company (Fig. 9).

Of them, 33.3% (50.6%) experienced problems of:- discharge of water pollutants, and 16.7% (18.4%) problems with treatment, disposal, and malodor of waste products. The same percentage, 16.7% (2.3%), experienced problems related to procedures with administrative offices, and 16.7% (3.4%) also experienced problems with startup of business itself. In comparison with averages for the other three Asian countries, there were few reports from the Philippines about problems with malodor, noise, or vibration; most replies were about procedural problems with administrative organs and problems with establishment of business operations. (Fig. 10,multiple answers).)

An interview survey revealed that in all four Asian countries treatment of effluent arising from operational processes was handled with the best measures available in the host country; however, some companies seemed not to be properly treating non-commercial domestic effluent that arises within the company. The survey also revealed that some companies, unable to find disposal sites for waste products, are storing these within their premises. Such a situation, unless appropriate control methods are adopted, may lead to environmental problems, and in this respect, are examples of issues that need tackling in the future.

17.3% (25.7%) of the companies think that environmental problems may arise in the future. Of them, 53.8% (24.4%) have concerns about vibration and noise problems, 38.5% (55.6%) consider treatment and disposal of waste products as potential problems, 30.8% (42.2%) fear discharge of water pollutants, and 30.8% (25.6%) fear discharge of air pollutants (Fig. 11, multiple answers).

Figure 7 Is Your Company Subject to Environment-related Regulations?

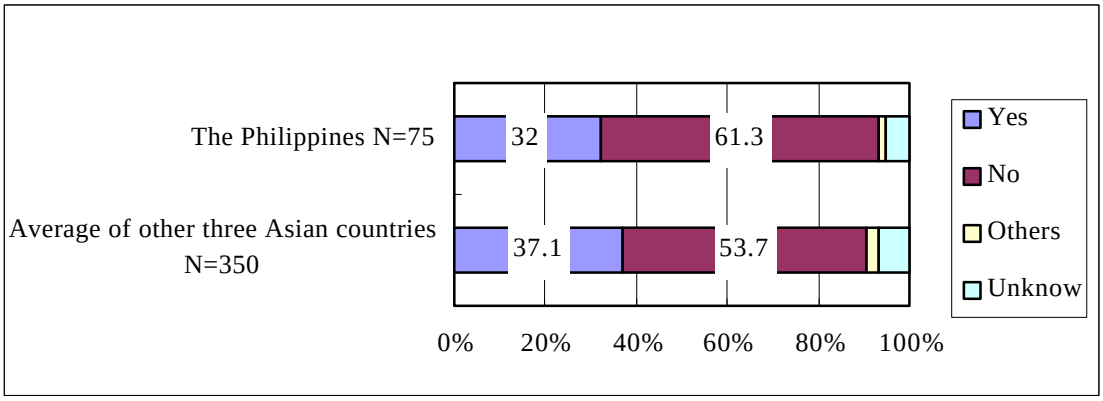


Figure 8 Does Your Company Submit Measurement Results on Air and Water Quality? (multiple answers)

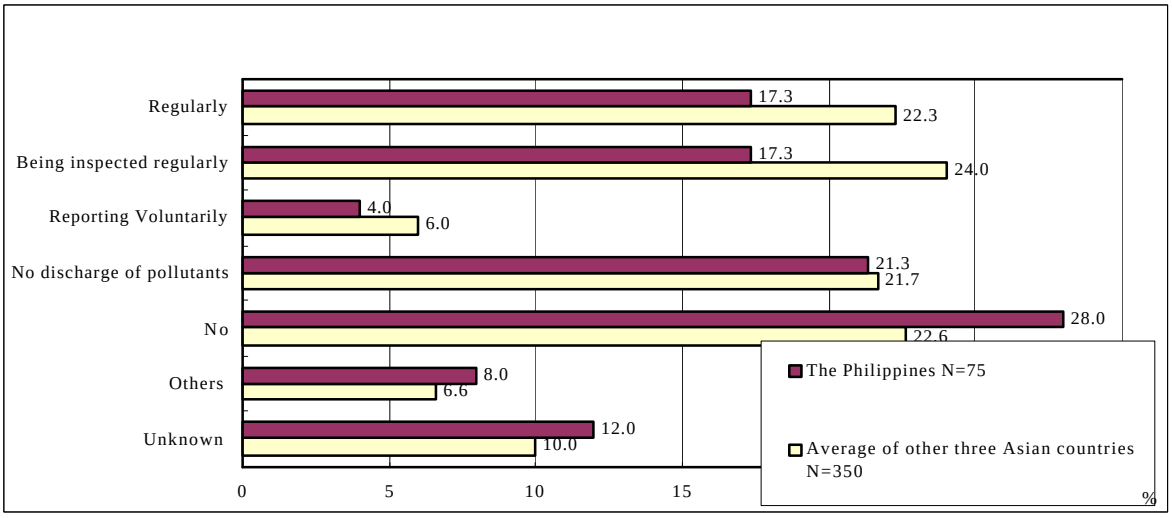


Figure 9 Have Your Company Experienced any Environmental Problems?

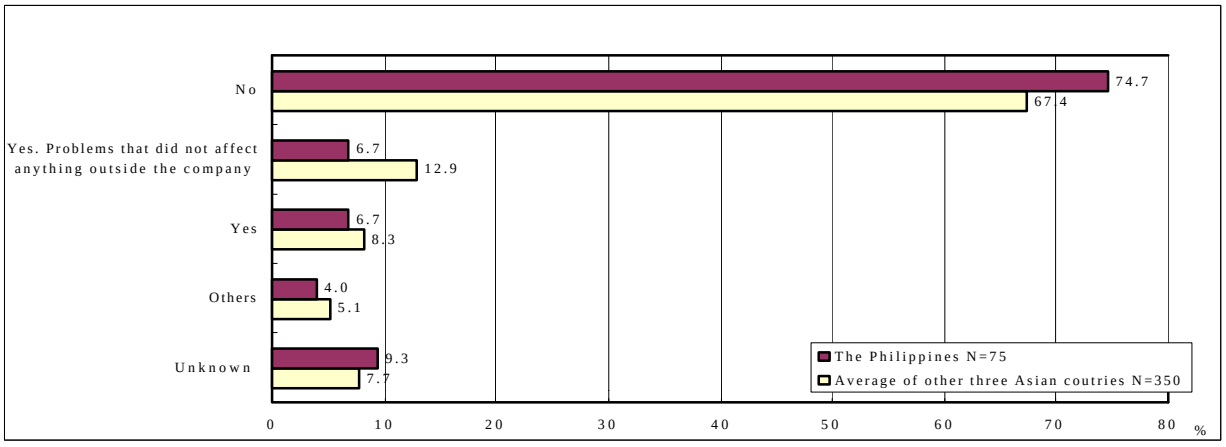


Figure 10 Problems in the Past (multiple answer)

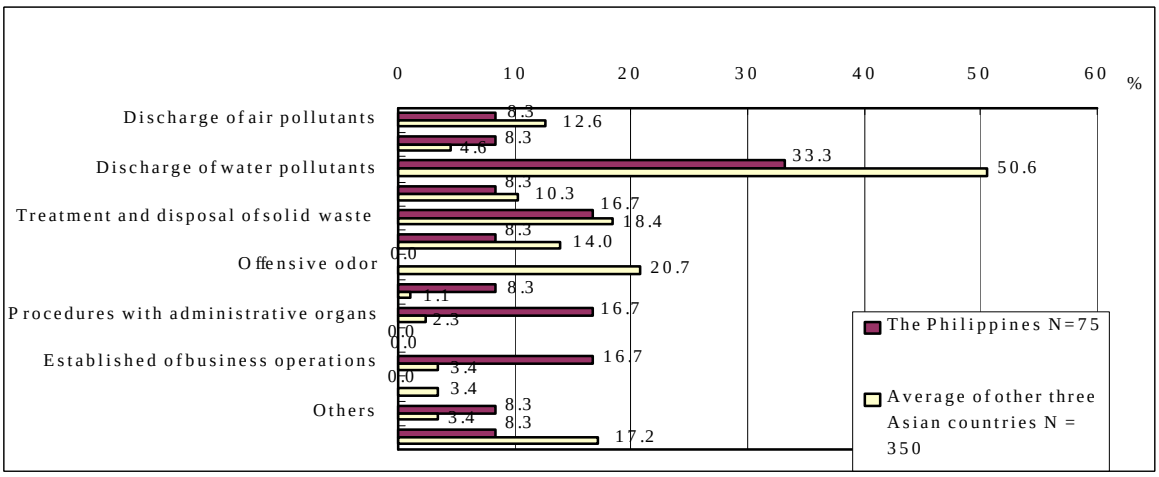
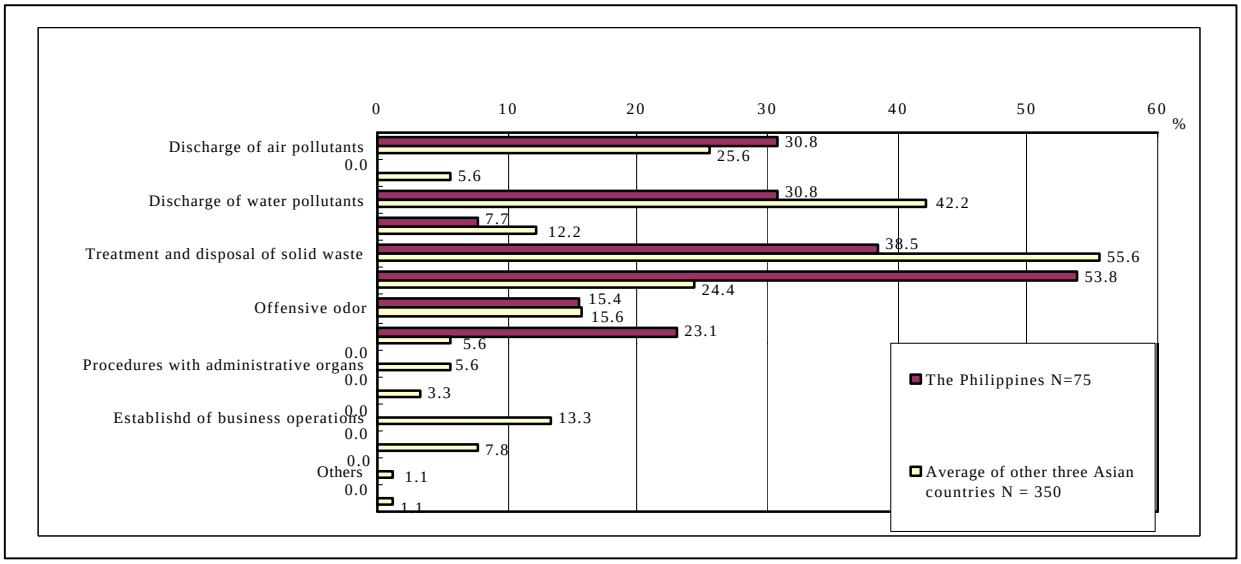


Figure 11 Problem in the Future (multiple answer)

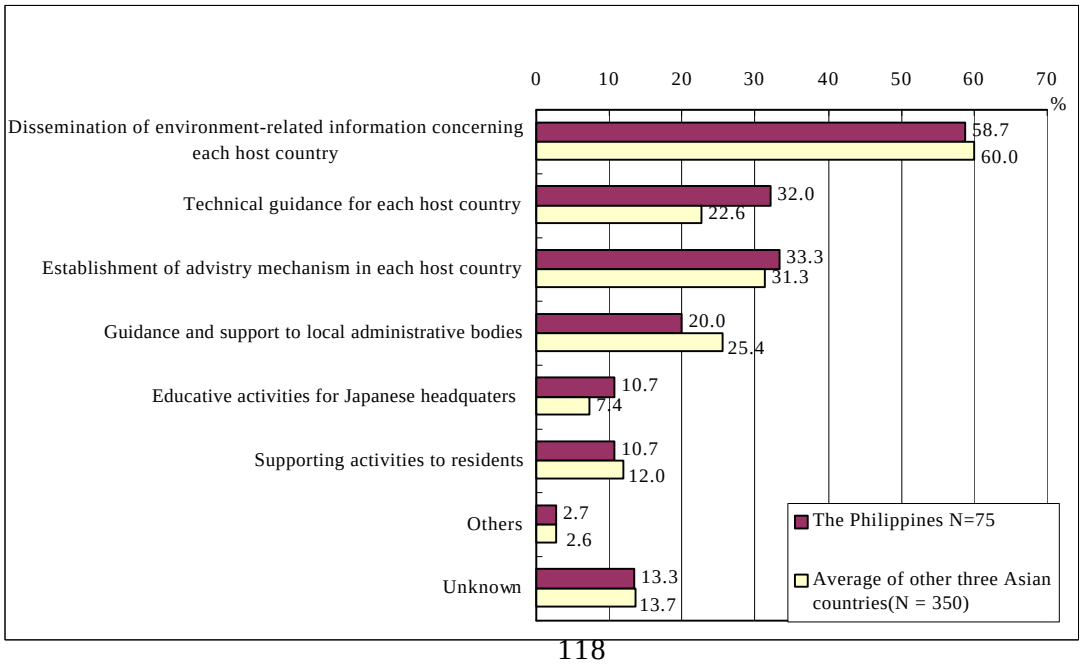


(5) What companies expect from the Japanese Government

The actions or measures these companies expect from the Japanese Government, so that Japanese companies overseas may further improve their environmental activities, include:- provision of environment-related information on each host country, i.e. compilation of handbooks 58.7% (60.0%); establishment of advisory mechanism in host country 33.3% (31.1%); ［guidance and support of local governments and training in Japan of host country's administrative personnel in order to improve environmental protection technology, measurement technology, etc. 20.0% (25.4%);］ [technical guidance on environmental technology with respect to measurement methods, etc. employed in host country 32.0% (22.6%)] (Fig. 12, multiple answers).

Requests were heard in the interview survey for the compilation of handbooks that give details of environmental regulations and status of environmental problems in each country and of case studies of actions taken by companies already operating in the relevant host countries.

Figure 12　What Companies Expect from the Japanese Government (multiple answers)



Appendix 4: Global Environmental Issues Today

1. Introduction

Global environmental problems are notably characterized by the global geographical scope of their impact, as opposed to conventional environmental problems such as industrial pollution, and by the temporal scope of their effects, which may well extend to future generations. Much is still to be discovered about their mechanisms and effects; also, once damage is done, it is too late. Because of the nature of global environmental problems, therefore, it is important to eliminate uncertainties about their mechanisms and effects as quickly as possible and to take suitable countermeasures. However, global environmental problems relate to manifold areas, and as such, call for an interdisciplinary approach that goes beyond traditional bounds and necessitates cooperation among wide-ranging sectors.

Despite the diversity of tasks confronting us, we have managed to build up rapidly in recent years knowledge about global environmental issues. International efforts at addressing the problems have greatly changed in nature. The Appendix 4 will discuss global environmental issues as classified into nine major areas, ranging from global warming to environmental problems of developing nations, and will comment on these in the light of the most up-to-date information on the status of the respective issue and international action being taken. In addition, the Appendix 4 will review the latest moves being made by the international community to tackle global environmental issues, mainly with respect to action in readiness for the UN Special General Assembly on the Environment, the first such conference to be held in five years since the Earth Summit in Brazil in June 1992 (UN Conference on Environment and Development), and also in readiness for the 3rd Session of the Conference of the Parties to the UN Framework Convention on Climate Change (Kyoto Conference on the Prevention of Global Warming: COP3) to be held in Kyoto in December 1997.

2. Global Warming

The earth's temperature is determined by the balance between the solar energy radiating from the sun and the heat that the earth as a whole emits into space. The earth is surrounded by "greenhouse gases" which absorb the heat radiating from the earth's surface. The higher the concentration of these gases becomes, the more the radiant heat is prevented from escaping into space, with the result that in the earth's temperature rises. This is what is known as global warming.

Possible consequences of global warming include rises in sea levels due to increases in the volume of the oceans and outbreaks of weather abnormalities due to changes in climatic mechanisms. Global warming, then, is an extremely important problem that is expected to have grave consequences, in the near future, on the living environment of human beings all over the world.

The foremost example of a greenhouse gas is carbon dioxide (CO_2), which is produced by combustion. Besides CO_2, there is methane, nitrous oxide (N_2O), and chlorofluorocarbon (CFC). The concentration level of carbon dioxide in the atmosphere is said to have been 260 to 280 ppm on average before the Industrial Revolution (latter half of 18th century), but levels have risen dramatically since then, nearing 360 ppm today.

Global warming has a wide impact on our lives. The 2nd Assessment Report published

in December 1995 by the Intergovernmental Panel on Climate Change (IPCC) states that there is considerable evidence that global warming occasioned by human activity is already taking place and predicts that there will be roughly a 2-degree rise in average temperatures and a rise of some 50 cm in sea levels by the year 2100, unless we take policy measures to prevent warming.

A higher sea level entails the danger of loss of land by many people in small islands and river delta areas, which are extremely sensitive to rises in water levels. Temperature increases will entail a big impact on the ecosystem and agriculture, as well as desertification and water shortages.

It will be too late if we start introducing measures after the effects of global warming become clearly felt. Thus, in May 1992, the Framework Convention on Climate Change was signed so that all countries of the world may cooperate in taking appropriate steps at prevention. The convention took effect from March 1994, and the first signatories conference was held in Berlin in March 1995 and the second conference in Geneva in July 1996. The third conference is to be held in Kyoto in December 1997.

In Japan, the Action Plan to Prevent Global Warming was drawn up in 1990. Diverse measures are being adopted in line with the Plan.

3. Depletion of the Ozone Layer

The ozone layer is found in the stratosphere, at the height of over 10,000 meters. It plays an important role in protecting humans, animals and plants from harmful ultraviolet rays by absorbing most of these short-wavelength rays that emanate from the sun. However, it has been discovered that this important ozone layer is being destroyed by man-made chemicals such as CFCs.

CFC is a name given to many different chemical substances which are made by replacing the hydrogen in hydrocarbons with chlorine or fluoride. These CFCs have useful properties. They are virtually harmless in themselves. They do not react with other substances. They easily gasify or liquefy repeatedly, according to the pressure applied. Some CFCs are able to dissolve oil well. Because of their usefulness, CFCs were widely used, as refrigerants in refrigerators and air conditioners, as cleaning agents of precision components such as electronic circuits, as foaming agents of cushions and polyurethane, and as spraying agents in aerosol spray cans.

Certain CFCs are chemically stable, therefore, if released into the atmosphere, they do not break up at all and reach the stratosphere. In the stratosphere, they absorb the strong ultraviolet from the sun and decompose, emitting chlorine atoms. These chlorine atoms break up ozone into oxygen molecules. In this reaction, one chlorine atom breaks up several tens of thousands of ozone molecules in a chain reaction. Thus, an immense number of ozone molecules are destroyed one after another.

Other similar destroyers of the ozone layer include halon, used in fire extinguishing agents, trichloroethane, used in detergents, and carbon tetrachloride, used to make solvents and fluorocarbon.

When the ozone layer is destroyed, the irradiation level of harmful ultraviolet rays

reaching the earth increases, and fears are that environmental impact will be felt, such as greater incidence of skin cancer and damage to the ecosystem.

In order to prevent these adverse consequences, an international framework, the Vienna Convention on Ozone Layer Protection and the Montreal Protocol on Destructive Substances of Ozone Layer were signed in 1985 and 1987, respectively. The Montreal Protocol became effective in 1989. After this, amendments were made three times, in 1990, November 1992, and December 1995, in order to make stricter regulatory standards. As a result, production of specified CFCs and carbon tetrachloride was stopped in developed countries at the end of 1995. As for developing nations, agreement has been reached for these substances to be totally banned in the year 2010. Nevertheless, the effect of the regulatory action will only start to be evident after the year 2000. Meanwhile, the ozone hole over the South Pole is reported to be growing larger year by year.

In Japan, in response to these international moves, the Law on the Protection of Ozone Layer by Control of Specified Substances (Ozone Layer Protection Law) was passed in May 1988. Controls and monitoring are conducted in accordance with this law.

4. Acid Rain

Acid rain is caused by fossil fuels such as petroleum and coal being burned and sulfur oxides and nitrogen oxides being released into the atmosphere. These chemicals rise into the clouds and repeat complex chemical reactions and ultimately turn into sulfuric acid ions and nitric acid ions, resulting in the phenomenon that highly acidic rain or dry granular substances fall to the ground. Acid rain normally refers to precipitation of pH (hydrogen ion concentration) 5.6 or below. In Europe and America, acid rain is seriously damaging the ecosystems of lakes and forests and it has become an international environmental problem, one which is transported across borders.

Monitoring results of acid rain over the 3 years between 1993 and 1995 recently published by the Environment Agency of Japan show that the annual average of pH levels of rainwater is 4.8 to 4.9 in Japan. Some trees have been found to have died and lakes with high acidity have been found. The Environment Agency has concluded that "acid rain in Japan has reached the level of adverse ecological impact." In a simulation study using as model the Kamakita Lake in Saitama Prefecture, it is predicted that if present levels of acid rain continue, the acidification of lakes will start to take place as early as thirty years from now.

Acid rain needs to be tackled on a wide geographic level. In order to discuss how best to conduct the monitoring of acid rain in the East Asian region, the Environment Agency has been holding a workshop annually since 1993, comprising experts from government and international organizations. In the experts' conference held in Niigata in November 1995, it was agreed that an East Asia Acid Rain Monitoring Network should be formed as early as possible, before the year 2000.

The Japan-China Joint Committee on Environmental Protection held in accordance with the Japan-China Environmental Protection Cooperation Agreement concluded in March 1994 regards acid rain as an important area of Japan-China cooperation in the field of environmental affairs.

5. Marine Pollution

Pollutants are entering the oceans through various channels. Nutrient salts and toxic substances enter the sea from the land, via rivers and the atmosphere; oil is leaked from ships and as a result of offshore extraction; waste materials are dumped or incinerated at sea.

Closer to home, our coastal waters are contaminated by numerous empty glass and plastic bottles that get washed ashore, and the red tides and blue tides have become common occurrences. As for marine pollution created by heavy metals and other toxic substances, developed countries are suffering from localized pollution and from high concentration levels of toxins in fish and shellfish.

In the open sea, pollution is deteriorating markedly in recent years. Ballast water and tank cleaning water that contain oil discharged from tankers have become causes of marine pollution by turning into oil films and waste oil clots that float on the surface. What is more, if vessels have accidents involving large-scale spillage of oil near coasts, fishing, industry, and shipping all suffer, posing grave economic consequences. However, over and above these, what is graver is the consequence on the marine environment.

In March 1989 when the oil tanker Exxon Valdez ran aground off Alaska, USA, and 42,000 kiloliters of petroleum spilled out into the ocean, a major disaster of the kind, local fishery activities and tourism industry suffered tremendous economic damage. Above all, because the accident took place in a part of Alaska near the Columbia Glacier, the ecological damage, including that to marine wildlife, was extremely serious.

Still fresh in the Japanese memory is the accident in January 1997, when the Russian registered tanker Nakhodka sank in the middle of the Japan Sea, discharging heavy oil and causing pollution over a wide area of Japanese coastal waters, disastrously affecting fishing and tourism as well as birds and the entire ecological system.

In order to pursue effectively the prevention of marine pollution, international cooperation is imperative. The IMO (International Maritime Organization) has been active in international action, including the drawing up of the London Anti-Dumping Treaty, the Malpole Treaty, and the UN Convention on the Maritime Law.

In order to prevent pollution of the Japan Sea and the Yellow Sea, the four nations of Japan, South Korea, China and Russia adopted the Northwest Pacific Regional Waters Action Plan (NOWPAP) in 1994. Monitoring and other practical measures are now being discussed.

6. Transboundary Movements of Toxic Waste

Recent years have seen the export of toxic waste from developed nations of Europe and America to countries in Africa and South America, resulting sometimes in inappropriate disposal or illegal dumping leading to environmental pollution. There have also been many incidents of ships carrying such exported toxic waste being refused unloading of cargo, forcing them to wander the seas without destination. The issue of toxic waste has thus become an international problem.

Because of this situation, UNEP (United Nations Environment Programme) initiated actions aimed at preventing environmental pollution created by cross-border removal of toxic waste and their disposal. Accordingly, the Basel Convention on the Control of the Removal of Toxic Waste Across National Borders and Their Disposal was adopted in March 1989. This convention took effect in May 1992. In March 1995, in the 2nd international conference of signatories to this convention, it was decided to ban the export of waste from OECD countries to non-OECD countries.

Japan signed the Basel Convention, and accordingly, in its domestic context, it passed the "Legislation on the Control of Export of Specified Toxic Waste" in December 1992. In order to make this legislation take smooth effect, the government is promoting international cooperation in order to implement environmentally appropriate management of toxic waste.

7. Biodiversity

The extinction of living species is progressing at the fastest ever rate since the earth began. The reason for this dramatic decrease in the number of species is not due to the process of nature but mainly due to human activity. Therefore, the issue of biodiversity is drawing attention as a global environmental problem.

On this planet, there is an extremely wide variety of life forms, from huge living things such as the blue whale and giant fir trees to small creatures such as plankton in water and microorganisms in the soil. These organisms live in diverse environments, interacting with each other and constituting the ecosystem of the whole earth.

About 3 to 4 billion years ago, life emerged on the planet. Ever since, in the process of evolution, many species appeared and many also disappeared, due to factors such as environmental change such as climate and topography or competition among species. Our ecosystem today is part of the earth's history. It is but one stage in the evolving world, which developed from the Paleozoic Era to the Mesozoic Era, then through to the Neozoic Era. Change will continue in the future. The extinction of species is something that always occurred in the process of nature. The issue at stake today is the rapid change effected by the expansion of human activity.

The reasons for the extinction of wildlife include:- destruction or deterioration of habitat, indiscriminate hunting, impact of invading species, food shortage, trapping to prevent damage to agricultural crops and livestock, and accidental capture. Of these, with respect to the destruction or deterioration of habitat, there are the serious problems of environmental destruction in tropical forests, coral reefs, and wetlands.

In order to maximally conserve the diversity of life on earth together with their habitats and to realize their sustainable use, the Convention on Biodiversity was concluded in June 1992, aimed at the fair distribution of benefits to be obtained from the genetic resources of living organisms. This convention took effect in 1993. The signatories have the responsibility to draw up a national strategy that includes concrete measures to achieve the protection of biodiversity. Japan adopted its national strategy on biodiversity in October 1995 after a cabinet conference of ministers with portfolio relating to global environmental conservation was held to approve the strategy.

8. Diminution of Forests (Especially Tropical Forests)

Concern is mounting on the destruction of tropical forests, the last remaining vast natural ecosystem in the world. As the domains of human activities expanded, the world's forests have continually diminished. This is because the use of timber increased and the area of land for development had enlarged. However, it only used to be in developed regions of the temperate zones where advanced urban civilizations sprang up and population increase was rapid that the large-scale destruction of forests occurred. Yet, in recent years, what is alarming is the rapid loss or deterioration of forests in developing nations of the tropics.

The final report of the forest resources assessment project conducted by the FAO (Food and Agriculture Organization of the United Nations) found that in the decade between 1981 and 1990, tropical forests decreased in area by an annual average of about 15.4 million hectares. This is a vast area equivalent to about 40% of Japan's surface area.

The immediate reasons for the loss of tropical forests are said to include:- excessive slash-and-burn farming, excessive harvesting of timber for firewood and charcoal, alteration of use to grazing or farming, etc., and inappropriate commercial logging. What lie behind these reasons are social problems in developing nations, namely poverty and population explosion.

In the Earth Summit held in 1992, the depletion of forests was taken up as one of the most pressing issues. Agenda 21 pointed to methods of protecting tropical forests and other forests of the world. Also in the Earth Summit, the Forest Principles Declaration was adopted.

This declaration is the world's first accord on forest issues. Although it has no binding power like a convention, it is considered to be an authoritative document that must be referred to in future international conferences and negotiations concerning forests and in all types of planning and implementation of forest improvements. In view of this declaration, a new International Tropical Timber Agreement controlling the import and export of timber was signed in 1994.

9. Desertification

The phenomenon of desertification is spreading all over the world. It is a crisis that the entire globe is now confronting. Desertification is defined as the "deterioration of the land caused by diverse factors including climatic change and human activity in arid, semi-arid, and arid semi-wet regions".

There are thought to be two major causes of desertification. One is the "climatic factor", the movement of arid areas due to changes in the global atmospheric environment. The other is the "human factor", the impact of human activity that goes beyond what the fragile ecosystem can accommodate in the arid and semi-arid regions of the earth.

These "human factors" include grazing of cattle over and above the grass's capacity of regrowth (overgrazing), decline of soil fertility due to shortened fallow periods (over cultivation), and the excessive cutting of trees for firewood and charcoal. Besides these, there is the problem of the accumulation of salts in irrigated agricultural land leading to the deterioration and barrenness of soil. Land that once becomes barren because of desertification is exceedingly difficult to restore to its former state, unless vast amounts of labor and money are expended for this purpose.

According to a UN survey, desertification is affecting 3.6 billion hectares of land or a quarter of the earth's total land area, and 900 million people, or a sixth of the world's entire population.

To combat the problems created by desertification, the so-called "Desertification Prevention Convention" was adopted in June 1994 and took effect in December 1996. This is a convention intended to mobilize the entire international community into taking cooperative action to counter this desertification problem which is becoming particularly grave in developing nations (especially Africa).

10. Environmental Problems in Developing Nations

In developing nations, such as those in Asia, provision of public services such as transport, sewerage, waste disposal and other urban infrastructures cannot keep pace with the rapid increase and congregation of population in cities. Consequently, problems including poor sanitation and air pollution due to automobile exhaust are worsening.

In countries where industrialization is underway, industrial pollution is becoming apparent, as pollution control of factories is inadequate. The result is that air quality in cities of the developing world is deteriorating. Especially, in cities where heating is necessary in winter, in cities which are located on plateaus, or in cities where car traffic is profuse, the problem of pollution is serious indeed.

In rivers which flow through cities or industrial areas, serious water pollution is evident due to industrial and domestic effluent. In addition, pollution created by toxic substances such as heavy metals is on the rise. Moreover, soil and food contamination is occurring because of the use of highly residue-prone agricultural chemicals. There is also increasing subsidence due to excessive drawing of underground water.

In Central and Eastern Europe and in the countries of the former Soviet Union, pollution control was inadequate and inefficient production activity had been allowed to take place under their planned economic system. The end of the Cold War clearly revealed the truth about the severity of environmental pollution there. Above all, very grave are the problems of air pollution caused by power plants and heat supply facilities and of water pollution of rivers and ground water due to mining effluent and overuse of agricultural chemicals and fertilizers.

Needless to say, developing countries are taking measures to curb pollution; however, financial resources, technology, personnel, and experience are all in short supply, and there is a limit to what each country can do on its own. In view of this, international aid from developed nations and international organizations are essential. Japan has valuable experience and advanced pollution control technology and know-how accumulated in the process of its surmounting of severe pollution problems during its period of high economic growth. Thus, world expectation is high for Japan to play an important role in this respect. Japan thus has launched many cooperative programs in the direction of solving pollution problems in developing nations, through bodies such as the Japan International Cooperation Agency (JICA) and the Overseas Economic Cooperation Fund (OECF).

11. Actions of the International Community

(1) Action in preparation for the UN Special General Assembly on the Environment

In June 1997, exactly five years after the United Nations Environment and Development Conference (Earth Summit) of 1992, a UN special general assembly was held for the purpose of reviewing Agenda 21, which was adopted at the Earth Summit. In readiness for this special general assembly, international organizations and governments conducted follow-up studies of Agenda 21. The Commission on Sustainable Development (CSD), established in February 1993 as subsidiary body to the UN's Economic and Social Council, has been meeting each year in order to deliberate on how Agenda 21 was being implemented. The 5th meeting to be held in April 1997 will conduct comprehensive discussions in preparation for the forthcoming UN special general assembly.

The UNEP (United Nations Environment Programme) deliberated follow-ups on the Earth Summit in its 1993 Management Council. It was agreed that priority areas of each UNEP program were to be determined, in view of the limited financial resources available, and that liaison with CSD and other organizations was to be strengthened.

The Management Council held between January and February 1997 discussed the UNEP's actions in preparation for the UN special general assembly.

UNDP (United Nations Development Programme), in addition to the individual national projects already in place, has a fund called Capacity 21, aimed at the improvement of policy forming framework/system, personnel development, and creation/reinforcement and support of policy implementation system in developing countries. This program is now being carried out.

ESCAP (United Nations Economic and Social Commission on Asia and the Pacific) in 1992 approved the establishment of the Commission on Environment and Sustainable Development. This commission aims at integrating environment into development in the Asia-Pacific region and to make effective use of energy and other natural resources for the maintenance and promotion of various conditions necessary for sustainable development. Every year, it discusses follow-up measures of Agenda 21.

The 3rd Environment Ministers' Conference was held in November 1995 and adopted the Declaration of Ministers on Environmentally Sound and Sustainable Development in the Asia-Pacific and the Regional Action Plan for Sustainable Development.

(2) Action in Preparation for COP3

In 1995 in Berlin, the First Session of the Conference of the Parties to the UN Framework Convention on Climate Change (COP1) was held and the following two major decisions were made.

First, it recognized that the stipulations made by the existing convention was inadequate and the Berlin Mandate was passed. This was a decision to start discussions to draw up a protocol or such documentary conclusion before COP3 in 1997 concerning policy measures for the realization of emission reduction targets of greenhouse gases within the specified period between 2000 and 2020.

The other important decision of this conference was that on AIJ, or Activities Implemented Jointly. This is an attempt to tackle the prevention of global warming by signatories in groups, and it was decided that a test period will run until the year 2000.

In July 1996, COP2 was held in Geneva, Switzerland. In the second half of this conference, ministerial-level meeting were held and a declaration of ministers were announced. This declaration held the IPCC (Intergovernmental Panel on Climate Change) the 2nd Assessment Report in high esteem as the most authoritative document at that point in time. Also, it again stated the necessity to activate political will in order to pass some legal document such as a protocol during COP3, in line with the Berlin Mandate. Its significance also lies in its assertion that future international pledges should be able to include legally binding targets. COP2 decided to hold COP3 in Kyoto in December 1997.

In contemplating future preventative measures against global warming, this COP3 in Kyoto in December 1997 has a tremendous significance. A protocol or other legal document is to be adopted to determine the international action to be taken beyond 2000. This means that COP3 will decide the direction of countermeasures against global warming in the 21st century. Numerous representatives of governments, international organizations, and NGOs will participate. World attention will focus on Kyoto. The conclusions reached in this conference will determine the future of mankind.

Appendix 5: Trends in International Standards for Environmental Management Systems

1. Background to Stipulation of Environmental Management Standards by the ISO

Various environmental problems have arisen in recent years, ranging from global issues, such as global warming, to urban domestic pollution, such as waste disposal and noise. What was needed in order to deal with these problems, it was said, was an earth-friendly lifestyle. Books were published on "how to be friendly to the earth" and "environmental account books" even appeared. It was claimed that a change in lifestyle was necessary so that we may create a society more oriented towards environmental conservation.

Meanwhile, in addition to changing the lifestyles of citizens, the notion that the other major player in society, the corporate sector that undertakes production activities, must also change has been rapidly gaining ground. The belief that the corporate sector must play an active role in dealing with environmental problems is held by the corporate sector itself. In 1991, the International Chamber of Commerce (ICC) drew up a Business Charter for Sustainable Development. The charter indicated 16 principles related to environmental management that are important for businesses to observe in order to achieve sustainable development, and declared that industry itself should take the lead in addressing environmental issues. The Japan Federation of Economic Organizations (Keidanren) issued the Keidanren Global Environment Charter in 1991, and appealed to industry to take a voluntary, active stance in dealing with environmental problems.

Demand for impartial, transparent environmental dealings and environmental cost assessment has been rising along with the globalization of the world economy.

Based on a study of various issues related to sustainable development, the Business Council for Sustainable Development (BCSD) concluded that the determination of international standards would be a most effective method of restraining environmental destruction due to corporate activities to a minimum and minimizing the load imposed on the environment. In May 1992, the council asked the ISO (International Organization for Standardization) to examine the possibility of setting international standards related to the environment.

At present, the ISO has the Technical Committee (TC) 207, with discussions going on under 6 subcommittees headed as follows:- EMS (Environmental Management System), environmental auditing, environmental labeling, environmental performance evaluation, life cycle assessment, and terms and definitions. Of these six areas, in EMS and environmental audit, the United Kingdom and the European Union's actions were ahead of others, and as mentioned above, standards were laid down and took effect in September 1996. With these international standards in place, export related industries at least are being required by their trading partners to obtain certification as one of the conditions of doing business. Thus, on a worldwide scale, especially in electrical industries, there are rapid moves being made to comply with these standards. In Japan, sectors such as automobiles, materials, large-sized chain stores, power generation and construction are hard at work to meet the standards. Some companies have already announced that actions along these lines are preconditions for business.

In order to create an environmental conservation-oriented society and a sustainable

society, a new framework and a new set of rules are steadily being created.

2. What is ISO?

The ISO (International Organization for Standardization), which has investigated the establishment of international standards on environmental management systems, is an international organization set up in 1946 with the aim of creating international standards for the purpose of promoting international exchange in the manufactured product and service sectors. At present, more than 90 countries are members. The ISO's original aim is to develop and standardize technical, manufacturing standards for all types of products. In other words, it is the international counterpart of JIS, the Japanese Industrial Standard.

To put it another way, as international transactions increase and trade expands, if there is no unified agreement on wide-ranging items such as the caliber of small screws, there will be immense trading problems. Thus ISO was born out of necessity. Today, not only industrial standards but many other things are also agreed through the ISO. For instance, the information desks at all the airports of the world bear the "!" mark for easy identification. Great though its influence, however, it must be remembered that the ISO is basically an NGO, and it is an organization that was set up voluntarily by industrial sectors of the world. In this respect, ISO is different from JIS. (However, the possibility of privatizing JIS is now under investigation in Japan.) Finally in Japan, the international standards adopted by the ISO is readopted as part of JIS, virtually in their original form. This is a point of distinction worthy of note.

ISO in recent years has not confined itself to manufactured products but have begun to undertake standardization work in more policymaking areas. The first such move was the establishment of the ISO quality control system standards (ISO 9000 Series). The latest environmental system standards come as the second batch of non-product standards. These are differentiated from general product standards, and are classified as systems standards.

The aim of ISO's establishing international standards for quality control systems was to internationally standardize the quality control system for commercial transactions, which had hitherto differed from country to country, and to ensure that a product is manufactured under an appropriate quality control system approved by a third party organization, even when a product is purchased from abroad.

At first, Japanese companies thought that since the Japanese quality control system was of the world's highest standard, there was no special need for them to obtain this ISO quality control standard and receive certification. In actuality, however, when trying to sell products to European government organizations and related companies, it became necessary for them to be employing a quality control system meeting the ISO standards. Faced with this situation, Japanese companies are now rushing to comply. To do so, they must obtain certification from a third-party organization with the relevant qualification.

What arrived after the quality control system standards is the ISO 14000 Series, now

being drawn up. It is a series of standards relating to environmental management systems of business enterprises. Standards regarding work safety and health are in the pipeline, after due deliberation is completed. All these standards, as with those on quality control systems, require auditing by third-party organizations before certification can be obtained.

The adoption of system standards is aimed at the standardization of quality control systems of the world and the simplification of their inspection so as to promote trade, at the combating of worsening environmental problems by giving companies a framework to systematically direct their effort at environmental conservation so that we may create a sustainable society, and also at the standardization of working conditions in order to improve the employment and welfare of workers.

3. Environmental Management Systems and Corporate Approaches to Environmental Issues

Environmental management in organizations including private companies need to be built on the four pillars listed below. These four pillars constitute the system itself and at the same time, should be considered as major assessment criteria for "evaluating the status of environmental action" of companies. The four pillars are namely:

(1) Construction of environmental management system;
(2) Environmental action being taken by offices, etc.;
(3) Environmental action being taken by each industry; and
(4) Information disclosure and social contribution with respect to environmental action.

(Within the definition of ISO standards, Environmental Management System means (1) only; (2), (3), and (4) are classified under environmental performance.)

When a company or similar organization incorporates into its corporate management system a management system that tackles environmental problems on a organization-wide scale, it is necessary firstly to work out how to construct the entire management system itself. This EMS is not something that can be constructed once and for all and can be forgotten about; it must be systematically operated in an orderly manner and must be continually reviewed. This EMS must create vitality and creative ingenuity in the organization as well as efficiently achieve environmental action.

Secondly, what is important is how to actually set about taking action. No matter how wonderful an EMS may be in place, there will be a problem if its action widely falls short of the level demanded by society or the level expected by consumers. Moreover, even if the range of actions is wide and wonderful, it will be meaningless if there is no clear indication of numerical targets or achievement deadlines. An empty shell of a program is no use at all. The actions to be actually implemented can be divided roughly into two, those that are common to businesses in their operations in offices, etc., and those that are carried out by each industry. Examples of the former would be measures taken in offices, automobile usage, and resources conservation, and includes the purchase and use of goods and services, construction and management of buildings, personnel training, and other activities that companies undertake as individual consumer entities. The latter would be, if it is a manufacturing industry, the purchase of raw materials and fuel, resources

and energy conservation in manufacturing processes, reduction of waste materials, environmental consideration in product design, and collection and recycling of used products.

Thirdly, it is important to widely disclose information about the actions taken on environmental issues like those listed above. Not only the company but individual employees must partake in activities that make social contributions in the environmental domain. It is no longer sufficient merely for the company to be doing things "properly." Then, information must be given on what kind of action with what aims are being implemented in what way and with what results. Were the initial targets achieved? If so, what were these targets, and if not, what was the reason for this failure, and what improvements are to be made? All these things need to be clearly conveyed to the consumer. Information must be accurately provided. Then, the disclosed information must be compared with that from other businesses and other industries, and it is important for the company to review in this way its own program with reference to the content and level achieved.

4. Requirements for Environmental Management System

In practical terms, how should a company embark on constructing its EMS? ISO standards require the following items. A company must construct an EMS in line with these standards and adopt an environmental policy and plan, implement and operate them, check the results and take remedial measures if there are problems, then review the entire system on the management level. This cycle must be in motion continually and efforts at improvement must be made. The suitability of the entire management system developed in this way will be audited by a certification organization. Then the company becomes certified.

In constructing the system, as set out in the requirements, all the responsibilities and authorities of all the staff concerned must be documented and the necessary manuals compiled. Daily records must be kept and stored. Thus a vast amount of labor is expected to be required for the implementation. Including the cost of certification, it is thought that the EMS will put a large burden on small and medium-sized enterprises.

Environmental Management Systems as Specified by the ISO

- ○ Environmental policy
- ○ Planning
  - • Environmental aspects
  - • Legal and other requirements
  - • Objectives and targets
  - • Environmental management programme(s)
- ○ Implementation and operation
  - • Structure and responsibility
  - • Training, awareness and competence
  - • Communication
  - • Environmental management system documentation

- Document control
- Operational control
- Emergency preparedness and response

○ Checking and corrective action
- Monitoring and measurement
- Nonconformance and corrective and preventive action
- Records
- Environmental management system audit

○ Management review
- Management review

There are five basic pillars to an Environmental Management System:
(1) Adoption of a management policy concerning environmental action;
(2) Having determined and assessed the environmental burden posed, setting of targets and drafting of an action plan concerning the company's environmental action;
(3) Construction of an organization and system concerning environmental action, operating these optimally;
(4) Self-assessment of results of environmental actions and review of policy, targets, plan, organization and system; and
(5) Review of all of the items (1) to (4) above by top management, aimed at making continual improvement on an organization-wide level.

The above-mentioned ISO's EMS standards were discussed by the world's experts as a set of standards that can be applied to all organizations. They are the world's unique standards agreed on by experts. To construct an EMS following the requirements of these standards is very useful for the business operator in terms of effectively operating environmental management. It is hoped that many businesses will construct their EMS in line with the ISO standards and take active initiatives in environmental management. As it is possible for a trading partner to require proof that there is an in-house EMS in place, a framework is now being created for a third party to vet and certify that an in-house system is in place in compliance with international standards.

To support efforts by companies that cannot immediately comply with the ISO standards, such as small-scale enterprises, Japan's Environment Agency has established an "Environmental Activities Evaluation Program." The environmental action assessment program is neither a guideline or a manual for the ISO standards on EMS. Still, it serves to facilitate the majority of business operators to "become aware of its involvement with the environment, set targets, and act" in a simple and voluntary manner, and thereby fulfill its duty as a global citizen and undertake concrete environmental action. It shows easy methods of determining the environmental burden arising from business activities and gives a check list of practical actions that will be expected from business concerns for the purpose of environmental conservation. It assists in the planning and promotion of action implementation. Participating in the program, business operators will acquire knowledge and experience which can be utilized in constructing an EMS that complies with the international standards.

The following standards have already been issued as ISO standards, and have been set as

JIS standards (as of March 1997).

ISO Standard No.	Name of Standard	Date of Issue
ISO 14001	Environmental management systems – Specification with guidance for use	September 1, 1996
ISO 14004	Environmental management systems – General guidelines on principles, systems and supporting techniques	September 1, 1996
ISO 14010	Guidelines for environmental auditing – General principles	October 1, 1996
ISO 14011	Guidelines for environmental auditing – Audit procedures – Auditing of environmental management systems	October 1, 1996
ISO 14012	Guidelines for environmental auditing – Qualification criteria for environmental auditors	October 1, 1996

Note: The above ISO standards have also been established as JIS standards. The numbers of the standards are the same; for example, ISO 14001 is numbered JIS Q14001. They were all established as JIS standards on October 20, 1996.

Appendix 6: Reference Documents

(1) In Japanese

・「国別環境情報整備調査報告書（フィリピン）」（1992 年３月、国際協力事業団企画部）
・「フィリピン環境プロファイル」(1993 年３月、海外経済協力基金）
・「発展途上国の環境法－東南・南アジア」（1996 年、アジア経済研究所）
・「アジア環境問題に貢献する企業活動」（1997 年、東京商工会議所）
・「平成５年度発展途上国環境問題総合研究報告書－海外共同研究」（フィリピン）～フィリピンにおける環境意識と公害紛争処理（1994 年３月、アジア経済研究所）
・「平成６年度発展途上国環境問題総合研究報告書－海外共同研究（フィリピン）～フィリピンにおける環境法の適用とその課題」（1995 年３月、アジア経済研究所）
・「アジアの環境の現状と課題～経済協力の視点から見た途上国の環境保全」（1997 年７月、通商産業調査会出版部）

(2) In English

- *Environmental Laws in the Philippines* (1992, Institute of International Legal Studies, University of the Philippines, Law Center、Manila , Philippines)
- *Philippine Environmental Quality Report 1990-1995* (November, 1996, Environmental Management Bureau, Department of Environment & Natural Resources, Manila, Philippines)
- *Metropolitan Manila Management Study* (1995, Housing and Urban Development Coordination Council, Local Government Development Foundation, Manila , Philippines)
- *Cavite-Laguna Urban Development and Environmental Management Study Volume IB Solid Waste Management Sector* (1997, Local Government Development Foundation, Manila , Philippines)

To perform this survey, we established the FY1996 "Committee to Study Trends in Environmental Considerations in Overseas Activities of Japanese Companies." The committee consisted of the following members.

FY1996 Committee to Study Trends in Environmental Considerations in Overseas Activities of Japanese Companies (in order of the Japanese syllabary).

Gotoh, Sukehiro	Director, Social & Environmental Systems Division, National Institute for Environmental Studies, Environment Agency of Japan
Kobayashi, Osamu	Advisor, Tokyo Electric Power Co., Ltd.
Tejima, Shigeki	Deputy Director General, Research Institute for International Investment and Development, The Export-Import Bank of Japan
Nakamura, Norio	Manager, Global Environment & Energy Group, KEIDANREN (Japan Federation of Economic Organizations)
Fukami, Hiroaki (Chairperson)	Professor, Economic Faculty of Keio University
Fujisaki, Shigeaki	Chief Researcher, Development Studies Department, Institute of Developing Economies
Yamaguchi, Mitsutsune	Senior General Manager, The Tokyo Marine and Fire Insurance Co., Ltd.

Secretariat

Kamei, Shosaku	Director-General, Global Environmental Forum
Nakadera, Ryoei	Deputy Director, Planning and Survey, Global Environmental Forum
Sakamoto, Yuki	Planning and Survey, Global Environmental Forum
Morishita, Ken	President, Eco-Management Institute Co.
Koike, Hideko	Eco-Management Institute Co.
Hayakawa, Masateru	Eco-Management Institute Co.

Overseas Environmental Measures of Japanese Companies (Philippines)
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Global Environmental Forum

Iikura Bldg. 3rd Fl., Azabudai 1-9-7, Minato-ku, Tokyo 106 Japan
TEL. 03-5561-9735 FAX. 03-5561-9737

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