INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROJECT (492 - 0465)

PROJECT PAPER

USAID/Philippines
SEPTEMBER 1991

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September 1991

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A = Add, C = Change, D = Delete — [A] — Amendment Number: _____ — DOCUMENT CODE: 3

2. COUNTRY/ENTITY: PHILIPPINES

3. PROJECT NUMBER: 492-0465

4. BUREAU/OFFICE: ASIA [ ]

5. PROJECT TITLE (maximum 40 characters): INDUSTRIAL ENVIRONMENTAL MANAGEMENT

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM DD YY: 09 30 96

7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4): A. Initial FY 91 — B. Quarter 4 — C. Final FY 93

8. COSTS ($000 OR EQUIVALENT $1 = ₱27.50)

A. FUNDING SOURCE	FIRST FY 91 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(-0-)	(-0-)	(-0-)	(13,214)	(6,786)	(20,000)
(Loan)	(-)	(-)	(-)	(-)	(-)	(-)
Other U.S. 1.						
Other U.S. 2.						
Host Country						
Other Donor(s)						
TOTALS	-0-	-0-	-0-	13,214	6,786	20,000

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) SAI	701	851	-	-	-	5,000	-	20,000	-
(2)									
(3)									
(4)									
TOTALS				-	-	5,000	-	20,000	-

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): _____ — 11. SECONDARY PURPOSE CODE: _____

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	ENV	TECH	TRG				
B. Amount							

13. PROJECT PURPOSE (maximum 480 characters)

To improve industrial management of pollution through: (a) preventing or reducing pollution at its sources; (b) reclaiming industrial wastes; and (c) encouraging cost-effective pollution abatement technologies.

14. SCHEDULED EVALUATIONS: Interim MM YY: 03 94 — Final MM YY: 08 96

15. SOURCE/ORIGIN OF GOODS AND SERVICES: [X] 000 [ ] 941 [X] Local [ ] Other (Specify): _____

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)

Note: The provisions of the payment verification policy regarding methods of implementation and financing, financial capability of recipients, and adequacy of audit coverage have been adequately addressed in this document.

J. C. Stanford, Controller

17. APPROVED BY

Signature: Malcolm Butler

Title: Mission Director, USAID/Philippines

Date Signed MM DD YY: SEP 27 1993

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION MM DD YY: _____

AID 1330-1 (1-79)

INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROJECT (492-0465)

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ABBREVIATIONS, ACRONYMS AND DEFINITIONS

Abbreviations and Acronyms

ADB	Asian Development Bank
AID	Agency for International Development, Washington, D.C.
AIDAB	Australian International Development Assistance Bureau
ASEAN	Association of Southeast Asian Nations
CIDA	Canadian International Development Agency
DANIDA	Danish International Development Agency
DENR	Department of Environment and Natural Resources
DPWH	Department of Public Works and Highways
DTI	Department of Trade and Industry
EIA	Environmental Impact Assessment
EMB	Environmental Management Bureau of DENR
ERA	Environmental Risk Assessment
GOP	Government of the Philippines
IEE	Initial Environmental Examination
IEMP	Industrial Environmental Management Project
IRR	Internal Rate of Return
LGU	Local Government Unit
NGO	Non-Government Organization
NRMP	Natural Resources Management Program
ONRAD	Office of Natural Resources, Agriculture and Decentralization, USAID/Philippines
PASS	Philippine Assistance Strategy Statement
PCAPI	Pollution Control Association of the Philippines, Inc.
PMA	Pollution Management Appraisal
USAID	United States Agency for International Development, Philippines

Definitions

Compliance Audit: An analytical technique by which industrial firms evaluate whether plant operations are meeting pertinent government regulations and identify measures to be taken to ensure these regulations are met.

Environmental Impact Assessment: A method of predicting the probable effects of a stated course of action on the biological, physical and human environment and judging the magnitude and significance of those effects.

Environmental Risk Assessment: An analytical technique for evaluating the degree of potential harm to the environment resulting from the hazard and magnitude of exposure to sources of environmental contamination.

Pollution Management Appraisal: An analytical technique for identifying methods by which industrial firms can reduce the amount or hazard of wastes generated, through methods such as source reduction, recycling/reclamation/reuse, or pollution control measures.

Wastes: Materials that are judged at the time of generation to have no further value or use. These may include air emissions, liquid effluents, and solid/hazardous materials.

SUMMARY AND RECOMMENDATIONS

1. PROGRAM TITLE AND NUMBER: Industrial Environmental Management Project (492-0465).

2. GRANTEE: The Government of the Philippines (GOP).

3. IMPLEMENTING AGENCY: The Department of Environment and Natural Resources (DENR).

4. FUNDING LEVEL AND TERMS: U.S. $20 million grant from Special Assistance Initiative funds (U.S. $5 million to be obligated in FY 1991).

5. LIFE OF PROJECT: September 1991 to September 30, 1996.

6. PROJECT PURPOSE: To improve industrial management of pollution through: (a) preventing or reducing pollution at its sources; (b) reclaiming industrial wastes; and (c) encouraging cost-effective pollution abatement technologies.

7. PROJECT DESCRIPTION: The project will promote improved pollution reduction with sustained economic growth in the industrial sector, through a partnership of the GOP, private firms and non-government organizations. The project will provide $20 million in grant funds over five years to support the following: pollution reduction initiatives ($13 million), policy studies and public/private dialogues ($2.8 million), capability building ($3.7 million), and evaluation and audit services ($500,000).

8. STATUTORY REQUIREMENTS: All statutory criteria have been met (Annex F).

9. RESOLUTION OF PROJECT ISSUES: All project issues have been satisfactorily resolved; these are detailed in the Action Memorandum requesting Project Authorization.

10. RECOMMENDATION: Authorization of a grant of $20 million, if negotiations do not significantly alter the Project in form or substance.

11. USAID/Philippines PROJECT TEAM MEMBERS:

ONRAD:Kevin A. Rushing	DRM:Patricia L. Jordan
ONRAD:Ed E. Queblatin	OFM:Eleanor Alcanites
PESO:Dario Pagcaliwagan	CSO:Stanley D. Heishman
OCP:John Starnes	OPE:Francisco Trinidad, Jr.
OPHN:Eilene Oldwine	OLA:Lisa Chiles

In addition, the assistance of Kenneth A. Prussner, ONRAD; Monica L. Stein, OFM; Abdul H. Wahab, ONRAD; and Dennis Zvinakis, OCP, is greatly appreciated.

PROJECT AUTHORIZATION

Philippines

Industrial Environmental Management Project

Project Number 492-0465

1. Pursuant to the section entitled "Multilateral Assistance Initiative for the Philippines" in Title II of Public Law 101-513, and in accordance with the authority delegated to me in Delegation of Authority No. 652, I hereby authorize the Industrial Environmental Management Project (the "Project") for the Republic of the Philippines (the "Cooperating Country") involving planned obligations of not to exceed $20,000,000 in Grant funds over a five-year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project. The planned life of the Project is five years from the date of initial obligation.

2. The Project will consist of assisting the Cooperating Country to improve industrial management of pollution by (a) preventing or reducing pollution at its source, (b) reclaiming industrial waste, and (c) adoption of cost-effective pollution abatement technologies, through funding for technical assistance, commodities, training, workshops, conferences, and operational support costs.

3. The Project Agreement(s), which may be negotiated and executed by the officer(s) to whom such authority is delegated in accordance with A.I.D. regulations and delegations of authority, shall be subject to the following essential terms and conditions, together with such other terms and conditions that A.I.D. may deem appropriate.

4. (a) Source and Origin of Commodities and Nationality of Services. Commodities financed by A.I.D. under the Project shall have their source and origin in the United States or the Cooperating Country, subject to the requirements of A.I.D. Handbook 1B, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have the United States or the Cooperating Country, subject to the requirements of A.I.D. Handbook 1B, as their place of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

(b) The Cooperating Country shall covenant to maintain adequate staffing in the Department of Environment and Natural Resources to carry out the Project.

Clearances:	Initial	Date
ONRAD:KAPrussner	[signature]	9/25/91
OPHN:MVoulgaropoulos	(draft)	9/19/91
OPE:PRDeuster	(draft)	9/19/91
CSO:SDHeishman	(draft)	9/20/91
OFM:JCStanford	[signature]	9/25/91
OLA:LChiles	[signature]	9/25/91
DRM:RDMcLaughlin	[signature]	25Sep91
OD:RAJohnson	[signature]	9/24/91

By: [signature]
Malcolm Butler
Mission Director
USAID/Philippines

Date: SEP 27 1991

INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROJECT (492-0465)

PROJECT PAPER

I. BACKGROUND

A. An Overview of the Industrial Sector

Philippine industries provide an opportunity for national recovery and sustained economic growth. The industrial sector employs 16 percent of the nation's workforce, contributes 33 percent of gross domestic product, and generates practically all of the nation's foreign exchange earnings ($7.8 billion in 1989). However, pollution from industrial sources is jeopardizing the nation's ability to sustain broad-based economic development and has negative effects on human health, social welfare and environmental quality.

Many factors contribute to the high levels of industrial pollution in the Philippines. Industrial technologies employed are often outdated and inefficient. An uncertain business climate inhibits investment incentives to install and/or upgrade pollution reduction technologies. Historically, there has been a lack of government, private (industrial) and public (citizen) agreement to implement existing laws and regulations on pollution prevention. The absence of implementable penalties for non-compliance with environmental standards mitigates desired changes in industrial performance.

Industrial pollution in the Philippines is becoming more serious and widespread. Industrial operations are found in most regions and provinces. A high percentage of industrial firms are reported to be out of compliance with air or water pollution control regulations s a result, economic and environmental damage from industrial pollutants is apparent.

For example, adverse effects on the health and quality of life of industrial workers and local residents can be attributed to uncontrolled discharge of pollutants into the environment. As the health, economic well-being and quality of life of local residents deteriorate as a result of industrial pollution, tensions arise between those who object to pollution and those whose jobs depend on the continued operation of the offending industrial plants. Increased information flow through the print and broadcast media is fostering awareness of the need for environmental improvements and the short- and long-term effects of continued improper waste discharge. Local citizens' groups are becoming active in seeking improvement of their environment and proper control of industrial waste discharges.

Environmental pollution control regulations primarily are patterned on the standards of industrialized countries. The enforcement of these regulations, particularly air and water quality standards, is uneven. With the budget of the government severely restricted, there are limited public agency resources for environmental management. Also, the majority of the human and financial resources of the Department of Environment and Natural Resources (DENR), the government agency charged with overall environmental management, is directed toward the urgent needs of reforestation and management of the remaining

forest, mineral, and land resources. The problem of enforcing compliance with strict regulations is compounded by the likely resultant loss of jobs. Given the country's current severe economic situation, these are major social and economic considerations.

Simple prescriptive measures are not easy. Efforts to clean up environmental problems in one medium -- i.e., water, air or land -- can often result in a transfer of the problem to another medium. For example, efforts to remove persistent toxic chemicals from the aquatic environment by installing a waste water treatment facility may actually result in these same toxic chemicals appearing in sludges that are improperly disposed of on land. Improper disposal of sludges may subsequently result in contamination of groundwater resources, which are used extensively for public water supply.

Although faced with constraints that have no easy solutions, the Government of the Philippines (GOP) recognizes that environmental management must be improved to meet the needs of an expanding population with expectations of improved quality of life. DENR has targeted pollution reduction as one of its highest priorities. This objective is clearly stated in the Philippine Strategy for Sustainable Development, which outlines DENR's activities to improve the industrial environment. DENR's programs encourage the active participation of Philippine industrial firms and citizens in the formulation, implementation, monitoring and evaluation of pollution control policies.

There are emerging efforts from industry, government and the public to establish a more market-led pattern of pollution reduction and prevention. From the industry perspective, pollution reduction initiatives appear to offer incentives that will appeal to firms' "bottom line" interests. For example, there is interest in the use of management tools similar to pollution management appraisals in Organization for Economic Cooperation and Development countries, which has resulted in significant reductions in annual operating and management costs or improvements in profit margins. There are documented cases of annual benefits to firms of over $100,000. The 3M Corporation, a major U.S. manufacturing firm, has launched a program entitled "Pollution Prevention Pays," which demonstrates the significant financial benefits to industry as a result of the type of activity proposed by the Industrial Environmental Management Project (IEMP).

The Philippine government is attempting to enforce compliance with existing environmental regulations and standards. The GOP recently demonstrated its commitment to industrial pollution control by shutting down several pollutive industry facilities, including a temporary shutdown of one of the largest copper mining operations in the country, when reduction/abatement procedures were not performing as required. The decentralization thrust of the Philippines and the imminent passage of the Local Government Code is increasing the role of local government officials in compliance monitoring and environmental impact assessment. Further, the GOP's establishment of intervention priorities among pollutive industries, in order to more effectively prioritize its limited financial and human resources, would benefit from the use of tools such as environmental risk assessment.

The government's role as the sole enforcer of pollution regulations is beginning to change. As a result of the interest of industry associations, environment-oriented non-government organizations (NGOs) and citizens' groups in decisions concerning the country's pollution problems, public and consumer pressure on industry and the government is becoming more influential.

In the past, the GOP's use of the enforcement "stick" has not been sufficient to manage industrial pollution. While enforcement is necessary, there is growing use of the incentive "carrot" (individual firm benefits), which has proved to be an effective pollution control measure in some developing countries. Thus, market-led approaches to industrial pollution management increasingly are being tested in emerging industrial nations such as the Philippines.

B. Project Rationale

1. Constraints to Industrial Development

Philippine industries can be an effective engine of economic growth for the country. They can contribute to the GOP's policy of decentralized economic growth in areas outside of Metro Manila. These industries, however, are in a period of transition, and face two major challenges. First, after years of protection, economic realities, which dictated the need for GOP liberalization of its investment and trade policies, have exposed domestic industries to the rigors of international competition. Second, as a result of various social and political pressures, the government has determined that the country can no longer afford continued economic expansion at the expense of environmental degradation.

From 1946 through the 1970s, the GOP promoted industrialization under an import substitution strategy. This strategy favored large, capital-intensive industries protected by high tariffs and import controls. Over time, the capital-biased production technology, coupled with the government's poor capability to enforce laws governing natural resource use, has led to unsustainable utilization of the country's natural resource assets, particularly in the forests. Degradation of the country's forest resources has contributed to loss of soil productivity and flooding in the lowlands, loss of flora and fauna biodiversity, and other environmental problems.

Most of these extracted natural resource assets (e.g., logs and lumber) were exported. In the process, these assets were converted into foreign exchange needed to purchase imported inputs and machinery. However, there was little reinvestment of these earnings back to the natural resource sector since the GOP failed to capture the resource "rents." It also has been observed that declining forest resource productivity has constrained the production of some of the country's emerging manufactured exports, in particular furniture and other wood-based products in which the Philippines has a clear comparative advantage.

Starting in 1981, the government embarked on a medium-term structural adjustment program aimed at making Philippine industries more efficient and competitive in world markets. The strategy included tariff reforms, import

liberalization, realignment of indirect taxes, and rationalization of incentives. Since 1986, industrial policy has encouraged regional decentralization and industrial development in the provinces.

These new policies, however, have not completely offset the effects of the earlier import substitution strategy and its negative consequences for industrial production costs. A major consequence of the import substitution strategy, which has clear implications on industrial pollution, is the lack of incentives to upgrade industrial/production technology. Technological upgrading is needed to raise production efficiency, improve competitiveness and prevent and reduce industrial pollution.

During the remaining months of the Aquino administration, trade and investment reforms are being undertaken to restructure the economy toward a greater external orientation. While commendable, the impact of these reforms, particularly on the need to upgrade existing production technology, is likely to be felt over the medium term. An appropriate intervention strategy currently is needed to moderate or arrest, through pollution reduction activities, the industrial pollution presently generated by existing firms.

2. Identified Needs and Project Objectives

Among the serious consequences of industrial pollution in the Philippines, the most pressing relates to the slow growth of the economy, explained in part by the high production costs and reduced human productivity associated with a fouled environment. Air and water pollution adversely affect human health as well as the ecosystems providing direct and indirect environmental services for agriculture, forestry, fisheries, tourism, and other income-generating sectors (see Annex I, Economic Analysis).

In the Philippines, the legal framework to control pollution largely is in place, yet industrial pollution remains a serious economic and social problem. Past approaches that focused primarily on compliance largely have failed. The implication is that many of the constraints to a cleaner environment are not solely legal in nature, but a mix of industrial, government and public influences.

Pollution reduction by Philippine industries will contribute to economic growth by:

-- Generating cost savings for industries that use energy or raw materials more efficiently, produce fewer emissions or effluents requiring treatment/disposal, and require clean air and water for operational efficiency.

-- Generating market demand for goods and services used in pollution prevention, reduction and management.

-- Transforming certain types of industrial waste into usable by-products.

-- Justifying new investments in Philippine industries by firms for which corporate environmental image is an important element in company policy; and

-- Avoiding work stoppages, legal and regulatory battles, and other pollution-related obstacles to plant operation.

The project will stimulate economic growth through several other avenues. Decreased pollution-related morbidity and mortality is a positive factor for labor productivity across all segments of the economy. Improved air and water quality increases yields in agriculture, forestry, and fisheries. For residences and industrial sites, cleaner environments raise property values and reduce maintenance and cleaning costs.

A major assumption of the project is that private firms will voluntarily participate in project activities once they become aware of the potential financial benefits resulting from improved technology and processes. A growing body of evidence, more fully discussed in Annex G, Technical Analysis, demonstrates that firms will voluntarily engage in pollution reduction and improved materials management practices.

IEMP will encourage the voluntary participation of industrial firms in the analysis and mitigation of their pollution problems. It also will assist DENR to strengthen its institutional capacity to deal with pollution policy formulation, implementation, monitoring and evaluation. In addition, the project will strengthen growing community support for pollution prevention and reduction activities. This multi-faceted approach to industrial pollution problems is based upon an analysis of Philippine culture, including its industrial culture (see Annex J, Social Soundness Analysis).

With respect to industrial firms, IEMP will focus on technical and management approaches to reducing waste quantities and hazards. Based on experiences elsewhere, many firms will find opportunities for significant reductions in emissions and effluents through increased process efficiency, materials substitution, reclamation/reuse/recycling operations, spill prevention, and other modifications to existing technologies. This should result in significant cost savings and added revenues for the targeted enterprises.

With respect to DENR, the project will focus on environmental risk assessment, policy analyses, and training to build greater capacity in the policy and institutional aspects of pollution management, in particular, with respect to compliance monitoring and the enforcement of regulations. The training opportunities under IEMP will increase DENR's capability in environmental risk assessment, pollution management appraisals, compliance monitoring, data collection and sampling and, to a limited extent, environmental impact assessments.

Finally, IEMP's attention to fostering greater public/private dialogue will expand and strengthen the role of industry associations, environment-oriented NGOs, and citizens' organizations in the discussion and resolution of the country's pollution problems. Greater private sector awareness of and involvement in the resolution of pollution problems will increase pressure on

all parties to strengthen their pollution abatement efforts in the short-term and pollution prevention initiatives in the longer term.

C. Relationship to USAID Strategy

USAID's overall country goal, outlined in the July 1990 Philippine Assistance Strategy Statement (PASS), is the promotion of broad-based, sustainable economic growth through the active partnership of the private and public sectors in fostering open and efficient markets and an open society. Cross-cutting themes of policy dialogue, private sector participation and decentralization apply to all programmatic objectives. Among the five strategic objectives of the PASS is the "effective and sustainable management of natural resources." The PASS identifies "inappropriate natural resource management policies," which have encouraged the depletion rather than the renewal of the Philippines' natural resource base, as a constraint to development. One USAID strategy for effective and sustainable natural resources management is the devolution of authority and responsibility to local governments to collect and expend taxes, set and pursue local development priorities and manage natural resources in their domain.

Because there are serious economic and health consequences of poor industrial environmental management policies, USAID determined during development of the FY 1990 Natural Resources Management Program (NRMP) that design of a companion industrial environmental management activity for FY 1991 funding was a priority for achievement of its natural resource management objectives. AID/Washington's Asia and Near East Bureau endorsed this approach in the NRMP approval cable (State 273917 dated 8/16/90), which stressed the importance of a "bridge activity" (the proposed project) to "identify and clearly define a downstream environmental agenda in such areas as water pollution, toxic waste disposal or others that may arise from industrialization ... Additional analyses [should identify] major industrial/urban environmental constraints leading to a clear picture of where Mission resources should be allocated to best achieve the Mission's broad-based sustainable economic growth goal." Funding for the design of the new activity was included as part of NRMP.

USAID's emphasis on sustainable natural resources management is consistent with the Agency's statement of mission and the development strategy for the newly-created Asia Bureau, under which USAID now falls. Among AID's six guiding principles for program development and implementation is "responsible environmental policies and prudent management of natural resources." The Asia Bureau is presently developing an activity known as "The Alliance for Environment in Asia." This initiative, which will focus on long-term sustainable economic growth in Asia through the promotion of sound environmental and natural resource policies and programs, has the management of industrial pollution and hazardous wastes among its three regional priorities. Thus, USAID's proposed activity is consistent with the development directions of the new Bureau.

D. Relationship to GOP Objectives

There are many national and local level agencies directly or indirectly involved in management of the industrial environment, including the

Departments of Trade and Industry (DTI), Public Works and Highways (DPWH) and Health, and the Housing and Urban Development Coordinating Council. DENR, however, is considered the lead agency in this sector.
The most recent statement of the GOP's policy in the area of industrial environmental management is contained in the October 1989 Philippine Strategy for Sustainable Development. The majority of the policies and administrative guidelines cited in this document pertain to the forestry sector, due to its importance to the economy. However, several specifically deal with management of the industrial environment, including the need for active involvement of the private sector and private citizens in pollution control and environmental monitoring, and the improvement of pollution control laws.

Specific institutional measures planned by DENR include the strengthening of the Environmental Impact Assessment/Statement System, expansion of its scope and use, and expansion of its ecological profiling and land use planning functions. In addition to its recently completed Philippine Master Plan for the Forestry Sector, DENR plans to complete a strategic environmental plan for Palawan and a regional environmental improvement plan for Metro Manila.

E. Donor Coordination

IEMP builds upon several other U.S. government initiatives, including:

-- The U.S. Trade and Development Program's Laguna de Bay Toxic Feasibility Study/Master Plan.

-- The U.S./Association of Southeast Asian Nations (ASEAN) Business Council's Market Study for Environmental Equipment and Services in the Philippines.

-- USAID's Mindanao Development Project and various agribusiness development, mining, agricultural, industrial, and private sector initiatives; and

-- AID's forthcoming ASEAN and Asia Bureau environmental initiatives and recent environmental studies on Philippine tanneries and semi-conductor enterprises.

In terms of other donor activities, the following multilateral and bilateral development activities are of particular interest:

-- The World Bank: The World Bank recently initiated the Industrial Efficiency and Pollution Control/Environmental Management Strategy Project. This activity largely is intended to formulate a strategy and action plan for industrial environmental management for the GOP -- i.e., DENR and DTI. Although the project's focus is Metro Manila, it likely will have broader national application. Much experience of potential benefit to IEMP will be gained during implementation of the Industrial Efficiency Project (September 1991 to June 1992). Other World Bank-funded activities include the environmental components of the Industrial Restructuring and Energy Sector loan programs.

-- The Asian Development Bank (ADB): The ADB has been assisting the Metro Manila Environmental Improvement Project and various projects for water supply and waste water treatment. An ADB-financed Environmental Sector Loan is anticipated in the medium-term, with project preparation to begin in 1992.

-- Bilateral Donor Activities

Germany has expressed interest in funding an industrial waste management project in Cebu to complement its on-going activities in solid waste management. DENR also has proposed that the German Technical Assistance Agency fund a technical assistance grant to assist in the development of a project on management of toxic and hazardous substances.

Denmark has provided funding to DENR through the Danish International Development Agency (DANIDA) to assist in the Pasig River Rehabilitation Project. Current activities -- i.e., a feasibility study to develop a long-term strategy for pollution reduction -- are nearing completion. Additional funding for implementation has been requested.

Italy has proposed funding air quality monitoring stations in Metro Manila, along with assistance for the development of an air quality management program. Funds have been provided to assist in the rehabilitation of the Navotas-Malabon-Tullahan-Tenejeros rivers. The Netherlands has provided additional assistance for this project.

Canada, through the Canada International Development Agency (CIDA), has provided assistance for the establishment of a waste exchange program in the Philippines, and is providing assistance for environmental planning and management.

Table 1 below provides additional information.

Table 1 - Active and Planned Donor-Assisted Projects Related to Industrial Environmental Management

Sector	Activity	Donor	Duration	Donor Funding ($'000)
Water	Pasig River Rehabilitation	DANIDA	1990-92	1,600.00
	ASEAN Coastal Resources Management	USAID	1984-91	2,500.0
	ASEAN-Australian Coastal Living Resources Management	AIDAB	1985-94	13,600.0
	Leachate Pollution from Open Dumping	Sweden	1991-92	92.0
	Navotas-Malabon-Tullahan-Tenejeros River Revival	Italy and Holland	1991-94	7,000.0
Land	Solid Waste Management in Cebu	Germany	Planned	4,500.0
	Hospital Services Development	ADB	Planned	100.0
Air	Air Quality Management in Metro Manila	Italy	Planned	1,000.0
Other	Industrial Efficiency and Pollution Control in Metro Manila	World Bank	1991-92	750.0
	Energy Sector Loan, Environmental Component	World Bank	1991-94	200.0
	Industrial Restructuring Project	World Bank	On-going	N.A.
	Environmental Management	CIDA	On-going	3,000.0
	Environmental Sector Loan TA	ADB	Planned	300.0
	Industrial Waste Exchange	CIDA	On-going	138.0
	Toxic and Hazardous Waste Management	Germany	Proposed	600.0
	Environmental Education	ADB	Planned	100.0
	Western Visayas Development Master Plan	ADB	Planned	1,336.0
	Environmental Impact Assessment	ADB	Planned	500.0
	Industrial Pollution Control - Cebu	Germany	1991-1993	1,200.0

N.A. -- Not applicable

II. PROJECT DESCRIPTION

A. Project Goal and Purpose

1. Project Goal

The goal of IEMP is to encourage sustained economic growth in the industrial sector, with corresponding improvements in health status.

2. Project Purpose

The purpose of the project is to improve industrial management of pollution through a three-part strategy that:

-- Prevents or reduces pollution at its sources.

-- Reclaims industrial wastes, when such reclamation is technically and financially feasible; and

-- Encourages cost-effective pollution abatement technologies, for pollutants that are neither avoided nor reclaimed.

B. Description of Project Components

The project has three components, as follows:

-- The Pollution Reduction Initiative, which assesses how to prevent and reduce industrial pollutants in selected industries and establishments and provides support for the implementation of pollution reduction recommendations.

-- The Policy Studies and Public/Private Dialogue component, which aims to rationalize policies on industrial pollution and to foster constructive communication and private sector/citizen participation in issues of industrial pollution; and

-- The Capability Building component, which builds cross-cutting knowledge and skills in technical, policy and administrative aspects of pollution reduction in support of project activities.

The project also provides funds for evaluation and audit services.

The Pollution Reduction Initiative consists of a set of interrelated technical analyses of pollution problems and risks. These analyses will lead to recommendations on methods to prevent or reduce pollutants at their sources, reclaim or exchange industrial by-products, and install pollution-control technologies. The prescription of one or more actions will be specific to individual industrial firms, based on thorough on-site data collection and analysis. Implementation of the prescribed activities is broadly referred to as Technology Transfer (Figure 1).

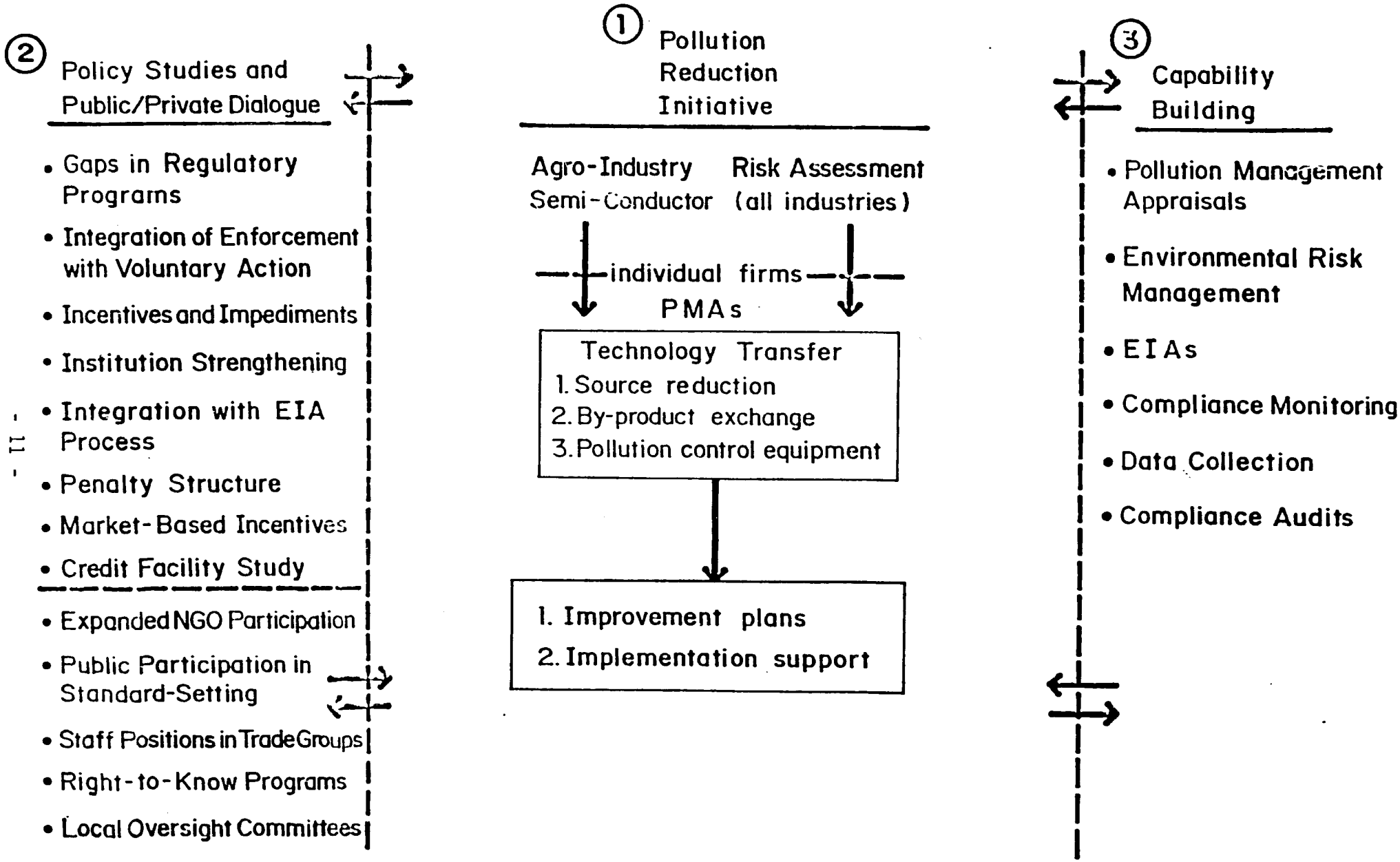

Figure 1. Interrelationships Among the Major Project Components

The project will work cooperatively with individual firms within selected industrial sectors to conduct pollution management appraisals (PMAs). PMAs are plant evaluations in which a few specialists work together with industry managers and technical personnel to recommend improvements in process efficiency and methods of reducing the quantities or toxicities of waste materials. This will make it possible to estimate payoffs of modifying operations to eliminate wastes, reclaim industrial byproducts, and/or install pollution control technologies.

The first round of PMAs will cover agro-industries -- e.g., piggeries, poultry farms, coconut processors and fish canneries -- and semiconductor plants. Annex L, Selection of Industries and Geographic Locations for Initial Pollution Management Appraisals, outlines the rationale for the selection of these industries; this information is summarized below.

-- Agro-industries rank high among DENR's priority targets for pollution reduction, and USAID is experienced working with them. Only limited new technical data are needed to assess management alternatives for the types of wastes generated by agro-industries. The modest technology requirements for pollution management in agro-industries present ideal opportunities to focus on training techniques. The Philippines has examples of agro-industries in which wastes have been converted to useful and marketable by-products, offering profit potential. This prospect of financial returns increases the probability of the project's success in finding cooperating firms with which to work.

-- The semiconductor industry, with strong multinational connections, has expressed a desire for assistance in waste management. Although there are not always opportunities to generate profits from the wastes generated by this industry, many of the wastes are toxic and hazardous. These wastes also may be a source of liability when the expected regulatory framework for such wastes comes into force in the Philippines. Like the wastes of agro-industries, the wastes of the semiconductor industry generally do not require extensive research to analyze, minimizing time and expense before action can be taken.

Concurrent with the conduct of PMAs in agro-industries and semiconductor plants, IEMP will conduct an environmental risk assessment (ERA) across a broad spectrum of Philippine industries. This will help DENR to identify priorities for improving policies, regulations, monitoring and enforcement with respect to industrial pollution (see Annex M, Goals and Process for Pollution Management Appraisal and Environmental Risk Assessment). The ERA also will serve to direct subsequent PMAs to those industries and firms that present the highest social costs when considering exposure, hazard, economic loss and other evaluation criteria.

For two reasons, firms selected for PMAs will be geographically concentrated. First, the adoption rate of PMA-recommended processes and technologies may increase, since competing firms will be able to observe benefits that accrue to firms that participate in PMAs. Second, PMAs may be able to capture economies of scale that would make an introduced technology possible due to the presence of many smaller firms in a specific geographic area.

The Pollution Reduction Initiative will require the training of pollution control officers in PMA methodology so that these skills are gradually developed and diffused across Philippine industries and consulting firms. For medium and small firms that cannot afford to employ pollution control officers, IEMP will provide services through the contracting and training of personnel to be attached to industry organizations and cooperatives serving those firms.

PMAs -- and, to some extent, the environmental risk assessment -- will generate recommendations for new or modified methods to prevent or reduce pollution at its source, recover and market by-products, and install pollution-control equipment. This will generate market demand by individual "client" firms -- i.e., for technology transfer -- for additional engineering and managerial services, feasibility studies and investment capital.

Through the Policy Studies and Public/Private Dialogue component, IEMP will support a wide range of policy analyses to identify how legal and regulatory controls on industrial pollution can be improved to advance economic and social conditions. Some of these policy issues will be identified during the course of the IEMP pollution management appraisals, environmental risk assessments, and other technical activities. Several policy issues have already been identified (see Annex N, Policy Studies and Public/Private Dialogue). These include:

-- Gaps in the current regulatory structure on industrial pollutants -- e.g., related to toxic materials and hazardous wastes and groundwater protection -- and the impact of alternative regulatory systems on industries' sales, profits, employment and pollution control efforts.

-- Integration of legal and regulatory instruments with voluntary industry actions in strategies to reduce industrial pollutants.

-- Incentives and impediments to voluntary action on pollution reduction by industry.

-- Decentralization of authority and financial resources among national, regional and local governments in the monitoring and enforcement of pollution policies.

-- Fines/penalties for non-compliance with environmental regulations.

-- Market-based instruments for management of industrial pollution.

-- The projected demand for and availability of financial resources, including credit, to implement identified industrial pollution management investments; and

-- Integration of pollution prevention and risk assessment into the process of conducting environmental impact assessments (EIAs).

IEMP's activities to enhance public awareness about industrial pollution will complement these policy analyses. The country already benefits from an increasing amount of dialogue between its citizens and industries on matters

of air and water pollution. The approach to be pursued by IEMP, however, focusing mainly on voluntary public/private pollution prevention and reduction, will require expansion and sharpening of the existing dialogue.

To accomplish this objective, IEMP will make greater use of industry associations and other non-government organizations to increase awareness and information on industrial pollution. The project will expand public participation in the deliberation on environmental policies and standards, consider the establishment of environmental staff position(s) in industry associations and Chambers of Commerce, communicate information on hazardous industrial materials and wastes to the public, and establish citizens' groups to discuss and evaluate local problems of industrial pollution in affected areas.

The Capability Building component will involve government, industries, environmental consulting firms, industry associations, universities, and NGOs. Many of the technical skills required for project implementation are scarce in the Philippines, and IEMP training opportunities will help meet the pressing need for development of local capacity in pollution management (see Annex O, Capability Building).

It is expected that most of the training will be conducted in the Philippines. Expatriate and local experts will present one- to two-week workshops, with the curriculum based upon training manuals developed by U.S. industrial pollution management trainers in collaboration with local experts.

The training component will target Philippine professionals in the public and private sectors and interest groups concerned with environmental management to ensure that project benefits will be sustained beyond the life of the project. Each of the project's training programs -- pollution management appraisals, environmental risk assessment, data and sample collection protocols, compliance audits and compliance monitoring, and environmental impact assessments -- will be designed to build local training capacity by:

-- Producing a training manual for each program that will be adapted to local conditions, regulations, and expectations.

-- Recruiting training teams composed of expatriate and local experts; and

-- Increasing the role of local trainers (and phasing out the participation of expatriate trainers) in training events over the life of the project.

Three of the project's six training courses -- pollution management appraisals, environmental risk assessment, and data collection/sampling -- are designed to respond directly to technical objectives. The remaining three courses -- compliance audits, compliance monitoring, and EIA training -- will strengthen the capacity of the professional Philippine private and public sectors to conduct environmental management activities that support project objectives.

The two types of compliance workshops -- audit and monitoring -- will strengthen public and private sector capacity to evaluate the compliance status of industrial operations. Workshop participants will learn environmental management activities that are driven by the need to be in compliance with government regulations rather than by pollution reduction criteria. These skills will have added importance given the advent of a stronger regulatory framework.

The EIA workshops, to be held in geographic areas where targeted industries are located, will respond to repeated private sector requests for technical training and to the government's decentralization policies, which will devolve EIA responsibility to environmental officers of local government units.

IEMP does not include general environmental education topics, which are an important GOP training concern, because IEMP's primary training objective is to improve professional environmental management capacity, and because donors such as ADB, the United Nations Development Program, and the Australian International Development Assistance Bureau (AIDAB) are planning or have initiated environmental education projects.

With respect to industries, the primary training targets will be the pollution control officers who work for industrial firms and industry associations. Other training targets in the private sector will include environmental consultants including, for example, members of academe. Training will focus on methods of conducting pollution management appraisals, environmental risk assessments, data collection and sampling protocols, compliance audits, and environmental impact assessments.

With respect to government and NGO staff, the primary purpose of training will be to strengthen capabilities in the conduct of environmental risk assessment, data collection and sampling protocols, compliance monitoring and EIAs. If deemed appropriate during implementation, environmental officers from selected DENR regional offices and from local government units (LGUs) will be trained in the conduct of environmental impact assessments and in related skills in environmental management. A number of government staff will participate in the training on pollution management appraisal to acquaint them with its purpose and methodology.

C. Management Approach

Prevention and reduction of industrial pollution requires action on behalf of industry, government and the public. IEMP will work with all three sectors, with a focus on industrial firms. This approach complements that of other donors, who are currently focusing more attention on institutional strengthening of GOP agencies and NGOs.

Project implementation and management is expected to be carried out by a general contractor, which will provide one long-term (U.S.) chief of party, a training coordinator, administrative support staff, and a mix of short-term consultants, who will provide technical assistance in the various project components.

IEMP will work on a voluntary basis with the individual firms and industry associations participating in the project. Because of the potential financial gains to firms as a result of project participation, there is expected to be little problem in identifying willing industry cooperators. Willingness to participate is expected to be enhanced by the choice of agro-industries and semiconductor firms as the starting point for the conduct of pollution management appraisals.

The project initially will devote considerable effort to workshops, which will lay out the project purpose and approach for prospective participants. These workshops will be designed to foster good will and the understanding among prospective participants that involvement in project activities will be in the best interests of the individual enterprises.

Project activities will focus on selected industrial sectors and their specific pollution problems, rather than on specific geographic locations or the size of participating firms. In general, however, the project will focus its efforts outside the Metro Manila area, which is inevitable given the initial emphasis on agro-industrial firms and their locations throughout the country.

The outcome of the Environment Risk Assessment will influence the selection of industries and firms for possible participation in the later stages of the project. While other than the largest firms will be the focus, firm size itself will not be a strong criterion for acceptance or rejection of industry cooperators. The selection of influential firms, however, is expected to encourage the participation of other firms in the respective sector.

Technical services, training and other assistance to private firms under IEMP will be provided on a cost-sharing basis. Participating firms will be expected to contribute personnel time, facility use and other inputs to joint activities on the basis of individual agreements drawn up with the project management team. Large firms will be expected to contribute proportionately more of the activity costs than small firms.

D. Project Inputs

Project inputs for IEMP will include: technical assistance in the conduct of PMAs and the Environmental Risk Assessment; technology transfer in the implementation of pollution reduction recommendations; training activities; and evaluation and audit services.

Technical assistance will be provided by a general contractor responsible for the coordination and integration of all project components, including the services of a chief of party and a mixture of short-term consultants. Technical assistance also will be required for the design and implementation of training courses and for the conduct of policy studies, public/private dialogue.

E. Project Beneficiaries

The direct beneficiaries of the project will be industrial firms that elect to participate in project activities, GOP agencies and public interest groups.

Indirect beneficiaries are expected to include industrial workers; communities in the vicinity of firms that have initiated pollution prevention or reduction activities; and "downstream" resource users, who will benefit from cleaner water, land and air and/or will suffer less exposure to toxic or hazardous pollutants.

1. Industrial Firms

Potential benefits to participating firms in industries such as agro-processing can be defined primarily as cost savings or increased revenues attributable to improved pollution management techniques. In addition to the direct benefits to firms that participate in IEMP, a "multiplier" effect across other firms within the same or closely-related industries is highly likely where demonstration effects are strong. However, not every firm will be able to identify simple solutions to their pollution management problems.

2. Government

The project's policy analyses, public/private dialogues and training opportunities will contribute to DENR's ability to set and enforce appropriate pollution standards. A substantial number of technical staff will obtain skills in environmental risk assessment, compliance monitoring, data collection and sampling, and environmental data management. The project will assist DENR to meet public sector responsibilities in facilitating improved industrial environmental management.

3. Public Interest Groups

Public interest groups and NGOs are increasingly active in industrial environmental management. They will benefit from education gained from training in Environmental Impact Assessments and compliance monitoring, as well as from direct public/private dialogue to identify problems and participate in the development of equitable solutions.

4. Industrial Workers and Communities

The potential benefits of most importance to industrial workers and the communities in which they live are improved health, reduced nuisance costs -- e.g., stressful living and working patterns to avoid pollution -- and the positive attitudes that accompany these changes. Many of these factors are difficult to measure but are no less real. In addition, it is likely that households in residential areas positively affected by IEMP will realize direct economic benefits from pollution reduction -- e.g., decreased soiling, decreased cleaning costs and increased property values.

5. Other Beneficiaries

The project will lead to positive impacts beyond those captured directly by industrial firms, their employees and adjacent communities. Air and water are fugitive resources, so benefits of pollution reduction may occur in locations far removed from the industrial sites affected by the project. In this regard, conceivable intersectoral gains are increased outputs from tourism, agriculture and, particularly, fisheries. The project may also have a

favorable impact on wildlife habitats, ecosystem stability, and other non-market and intangible values.

F. **Project Outputs**

By the end of the project, IEMP will have achieved measurable reductions in the quantities and toxicities of industrial emissions, effluents and wastes at a number of industrial sites in the Philippines. This will be accompanied by:

-- Improved efficiency and management of energy, raw materials, and waste recovery and recycling.

-- Increased investments by targeted firms in pollution control technologies.

-- Strengthened Philippine capacities to conduct pollution management appraisals, environmental risk assessments, environmental impact assessments and compliance audits, as these skills pertain to industrial sites.

-- Advances in the policy and regulatory framework regarding pollution management in the Philippines; and

-- Expanded public participation in the development of policies and projects to prevent, reduce, and manage the country's industrial pollution.

Projected end-of-project outputs are:

-- Completion of an environmental risk assessment that identifies the five industry sectors that pose the highest social costs from industrial pollution.

-- Completion of pollution management appraisals at up to 150 industrial sites.

-- Completion of about ten policy analyses to support advances in regulatory, fiscal, and administrative dimensions of pollution control.

-- Five public/private fora held on industrial environmental management issues; and

-- Substantial numbers of Filipinos trained in pollution management appraisals (200), environmental risk assessments (60), environmental impact assessments (700), compliance audits (200), compliance monitoring (200) and data collection/analysis (300).

III. IMPLEMENTATION ARRANGEMENTS

A. Implementing Entities, Roles and Responsibilities

The implementation of IEMP will require coordination with and input from many public and private sector entities. The roles and responsibilities of these entities are discussed below.

1. Government of the Philippines

DENR will be the lead GOP implementation agency and will coordinate project implementation with other involved GOP agencies, the private sector and non-government organizations. DENR's coordination arrangements will be detailed in an annual implementation plan which will be prepared by DENR and the general contractor and reviewed by USAID. It is anticipated that DENR will coordinate project activities with GOP representatives such as DTI, DPWH and representatives of DENR regional offices. Regional or local working groups also may provide input on specific topics. Working groups could be composed of representatives from LGUs, regional authorities, industry associations, and public interest groups.

2. USAID

The USAID Office of Natural Resources, Agriculture and Decentralization (ONRAD) will be the technical office responsible for overall project coordination, implementation and monitoring. Other USAID participants in project implementation and monitoring will include the Contract Services Office, the Mission Legal Advisor, Office of Financial Management, Private Enterprise Support Office, the Office of the Program Economist, and Development Resources Management.

3. Industry Associations

Representatives from industry associations such as the Pollution Control Association of the Philippines, Inc. and the Chambers of Commerce will play a critical role in the dialogue between the government and industrial firms on issues of responsible corporate environmental policy, pollution reduction equipment and processes, and other issues. Participation of these organizations in the public/private dialogue also will be essential in coordinating industry perspectives on DENR's regulatory actions as well as for encouraging greater communication between industrial firms and communities.

4. Non-Government Organizations

Public interest groups (NGOs) will serve their constituencies by communicating their views to DENR on the development, implementation and evaluation of new government policies and regulations, and as a conduit for transmission of government and industry concerns on pollution problems to their memberships and the general public.

B. Implementation Plan

1. Pollution Reduction Initiative

Of the project components, the Pollution Reduction Initiative will drive the other two components. The Pollution Reduction Initiative will consist of a number of discrete tasks to be accomplished over the life of the project, as described below. Figure 2 on the following page provides a graphic representation of the implementation plan for this component.

a. Task 1 -- Workshop for Industry Associations

This task will receive primary attention early in IEMP implementation. A series of one-day seminars will be conducted to explain the project rationale to key decision makers from industry associations, starting around September 1992. The workshops will publicize and generate support for the first round of PMAs to be conducted primarily with agro-industrial and semiconductor firms.

b. Task 2 -- Training of Appraisal Team Members

Training sessions on the methodology and implementation of PMAs will be organized by the project training team in order to prepare Philippine experts for implementation of the first round of PMAs. The initial training session will start in September 1992. Additional PMA workshops will be held quarterly thereafter.

c. Task 3 -- Environmental Risk Assessment Training and Implementation

The Environmental Risk Assessment will help government and project personnel determine which industries and firms to target for the second round of PMAs. Implementation of the ERA will begin following a workshop for officials of DENR and other government units on the methodology and implementation procedures for the ERA, beginning in October 1992. Implementation of the ERA will start in October 1992 and will take approximately 18 months to complete.

Tasks 1, 2 and 3 will begin concurrently. Tasks 1 and 2 will be repeated throughout the project, as needed.

d. Task 4 -- Pollution Management Appraisals

The first round of PMAs will begin once local experts have been trained in the relevant methodology and procedures, starting in October 1992. It is anticipated that during the first round of PMAs, appraisal teams will work primarily with participating agro-industrial and semiconductor firms, but they will respond to specific requests from firms in other industries, as feasible.

e. Task 5 -- Annual Internal Project Assessments

The annual internal project assessments will serve as the primary internal mechanism for monitoring all IEMP activities for the project implementation team. The team will evaluate IEMP's progress in July 1993 and make mid-course

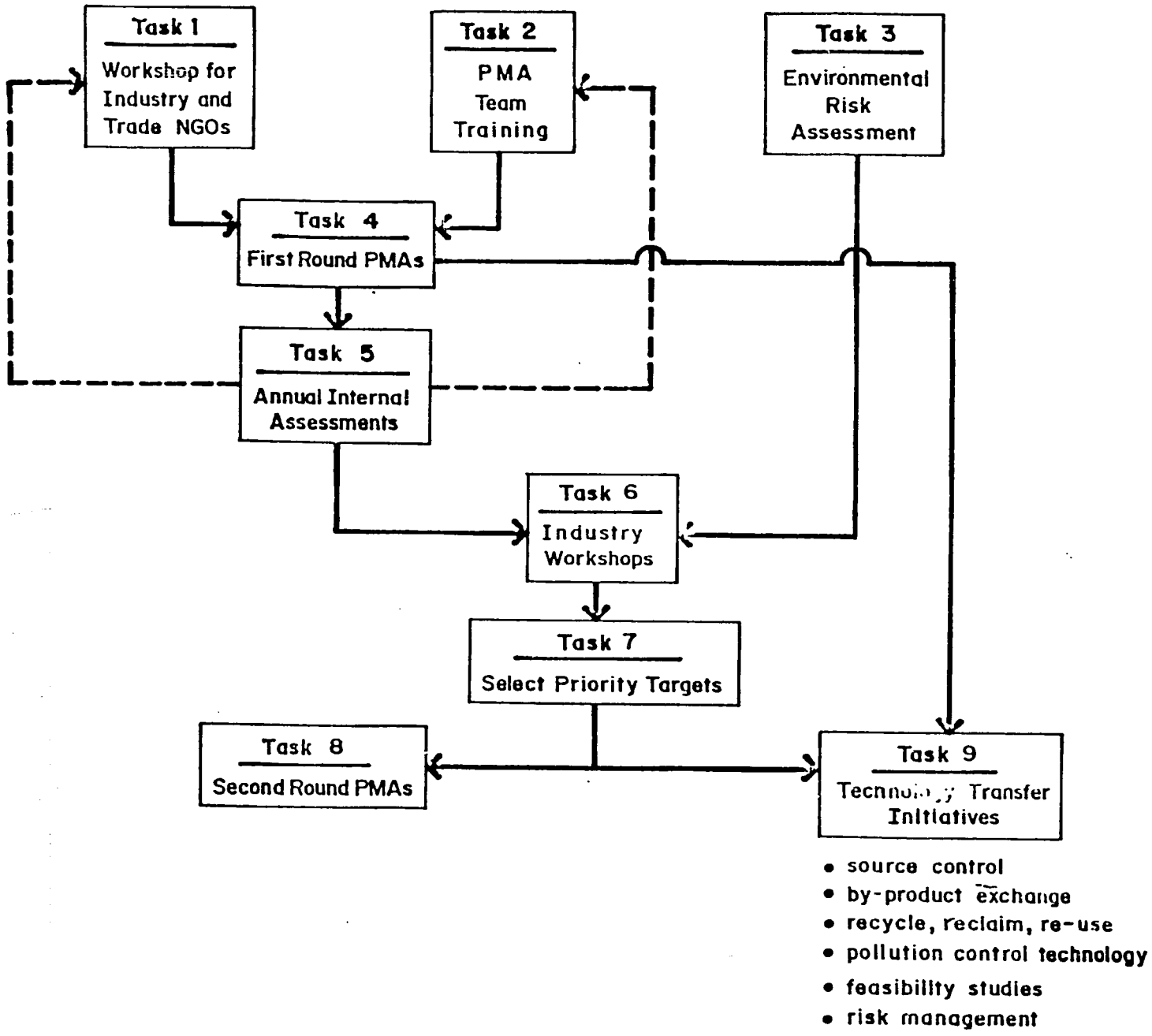

Figure 2. Proposed Project Implementation

adjustments in project activities and appraisal methods as needed. The first annual internal project assessment also will be a vehicle to prepare for the midterm external project evaluation scheduled for January 1994. Follow-up internal project assessments will be held in July of 1994, 1995 and 1996.

f. Task 6 -- Industry Workshops

Industry workshops will be conducted during May and June 1994. These workshops will be a second round of the workshop conducted during Task 1. Key decision makers from industries targeted under the ERA will be invited to attend one day introductory seminars, which will inform participants about the financial and environmental advantages to be gained from participating in PMAs.

g. Task 7 -- Selection of Priority Targets

The industry workshop sessions will allow the project implementation team to work with interested firms from the targeted industries to formulate an agenda and schedule for the second round of PMAs in July 1994.

h. Task 8 -- Pollution Management Appraisals -- Second Round

The second round of PMAs will begin soon after the Environmental Risk Assessment has been completed and targeted industrial firms have agreed to participate in the PMAs. This is anticipated to occur not later than August 1994. PMAs will be similar in methodology and procedures to those conducted under Task 3, but will concentrate on participating firms from those industries targeted by the ERA.

i. Task 9 -- Technology Transfer Initiatives

Based upon the results of the PMAs and the commitment of the firms, the project will assist with developing the PMA recommendations into actual improvements by participating firms. Technology transfer initiatives could begin as soon as the first PMA is complete -- i.e., by December 1992. This task will provide technical support to industrial firms that have completed a PMA and have opted to act upon the appraisal's recommendations. However, given the lead times necessary for completion of the initial PMAs and industrial firm decision-making on actual implementation of appraisal recommendations, it is anticipated that the majority of technology transfer assistance will take place between October 1993 and September 1996.

2. Policy Studies and Public/Private Dialogue

The first two of the policy studies outlined in Section II.B will start in September 1992. Two more policy studies will be initiated by February 1993, and the remaining three studies will be scheduled to begin between July 1993 and July 1994. Policy studies have been planned to start sequentially so that the first studies' conclusions can inform subsequent reports' direction of inquiry. Based upon the results of the credit facility study, USAID will consider the need to refocus the project to include a credit component. This could be accomplished through amending the project and either increasing the project authorization or realigning budget items. Activities in support of an

expanded public/private dialogue of pollution issues will begin by September 1992.

3. Capability Building

Training activities will take place throughout the project. The first workshop for pollution management appraisals (Task 2) will start in September 1992. The training group will receive one week's instruction before joining an actual PMA. A one-week review will be conducted after the PMA, which will provide participants the opportunity to strengthen those skills they found were lacking as they participated in the appraisal. The PMA workshops will be conducted on a quarterly basis.

The first workshop on environmental risk assessment (Task 3) will start in October 1992. DENR's Environmental Management Bureau (EMB) staff have expressed a strong interest in receiving ERA training, since they plan to address hazardous and toxic waste problems. Since environment-oriented NGOs in the Philippines are responsible for citizens' interest identification, aggregation, and articulation concerning environmental issues, NGO members will be included in these workshops. Additional workshops will be held annually.

A workshop on sampling and data collection of environmental pollutants will be presented in February 1993. Both private and public sector laboratory technicians and officials require further training in data collection and sampling protocols in order to ensure the accurate measurement of standardized ambient air, ambient surface water emission and effluent, ground water, and hazardous waste samples. DENR officials will be trained in sample collection techniques and protocols as part of the environmental risk assessment.

The Compliance Audit and Compliance Monitoring workshops represent two methods for ensuring responsible environmental management by the private and public sectors. Compliance audit workshops will be conducted for the private sector and compliance monitoring workshops will be conducted for the public sector. The first audit workshop will be conducted in December 1992, and the first Monitoring workshop will be held in June 1993. Both workshops will be held on an annual basis thereafter.

Training in EIA methodologies will include both public and private sector participants. In the public sector, EIA training will concentrate upon providing further professional development for DENR/EMB officials who are currently responsible for reviewing EIAs for industrial projects, in particular, for those industries that are associated with IEMP. In addition, the project will consider training LGU officials once the responsibility for conducting EIAs is defined by the GOP. Pollution control officers and plant managers may also receive EIA training. The first EIA workshop will be held in September 1992, and workshops will be presented on a semi-annual basis thereafter.

C. Implementation Schedule

Figure 3, Illustrative Implementation Schedule, is shown on the next page, with individual tasks described on the following pages.

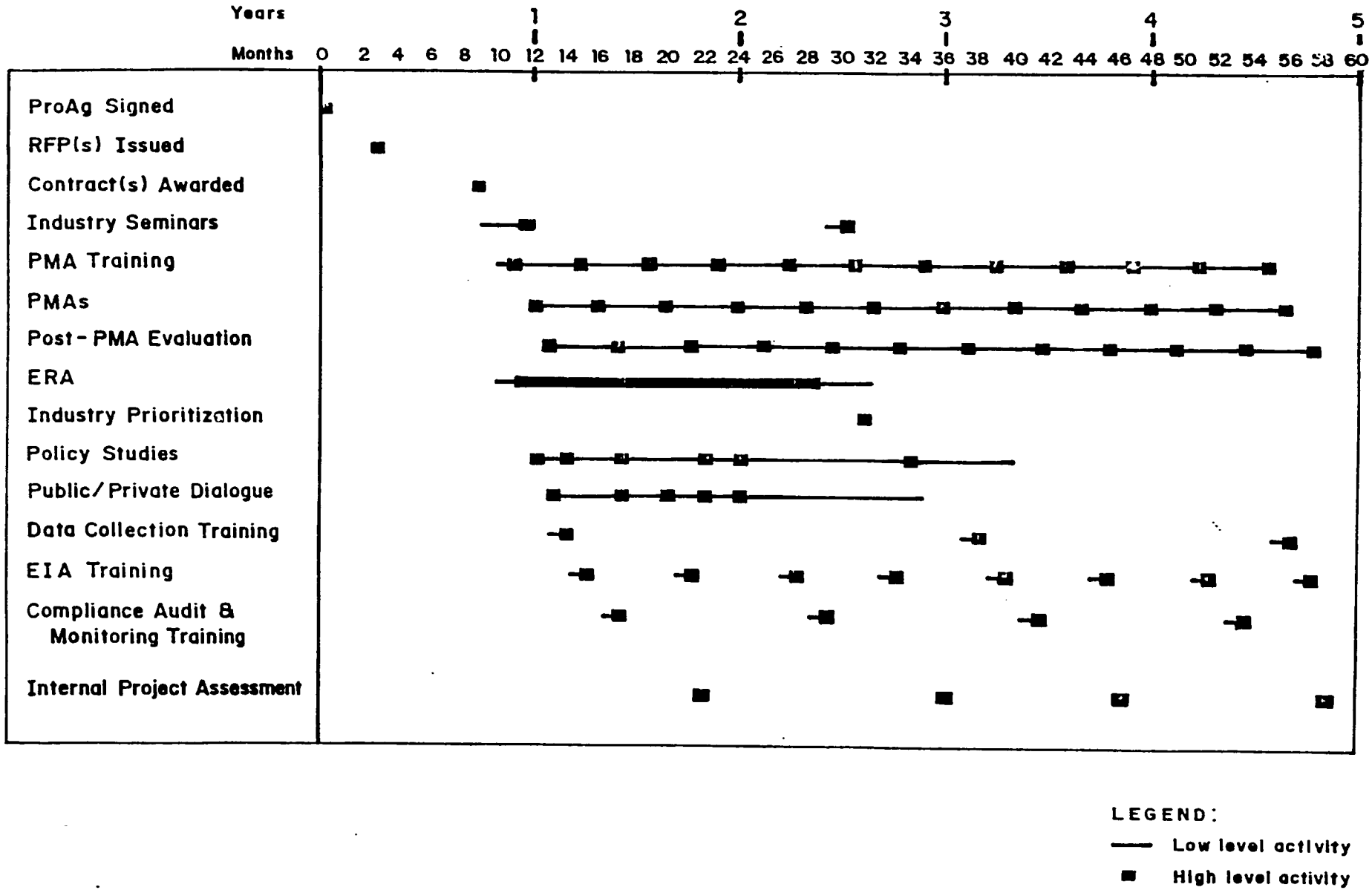

Figure 3. Illustrative Implementation Schedule

Fiscal Year	Action	Target Date
1991	-- Project Agreement signed	September 1991
1992	-- Initial Conditions Precedent met	November 1991
	-- Issuance of request for proposals for general contractor	November 1991
	-- Selection of general contractor	March 1992
	-- General contractor in place and operational	July 1992
	-- Begin introductory seminars (ten workshops to be held in the first round)	September 1992
	-- First PMA workshop (held quarterly)	September 1992
	-- First public/private dialogue workshop	September 1992
	-- Begin policy studies 1 and 2	September 1992
	-- First Environmental Impact Assessment workshop (held semi-annually)	September 1992
1993	-- First Environmental Risk Assessment workshop (held annually)	October 1992
	-- Start Environmental Risk Assessment	October 1992
	-- Begin initial PMAs with participating agro-industrial and semi-conductor firms (3-4 PMAs per month)	October 1992
	-- Initiate Compliance Audit workshops (held annually)	December 1992
	-- Initiation of tech. transfer activities in response to firms participating in PMAs	December 1992
	-- Initiation of Investment Opportunities activities	December 1992
	-- Begin public/private dialogue task 1	January 1993
	-- Submission of final report for policy study 2	January 1993
	-- Completion of public/private dialogue task 2	January 1993
	-- First sample and data collection workshop	February 1993
	-- Begin policy studies 3 and 7	February 1993
	-- Submission of final report for policy study 1	March 1993
	-- Completion of public/private dialogue task 1	March 1993
	-- Begin Compliance Monitoring workshop (held annually)	June 1993
	-- First annual internal project assessment	July 1993
	-- Begin policy studies 4 and 5	July 1993
	-- Initiate public/private dialogue tasks 3 and 5	July 1993
	-- Initiate Public/Private Dialogue task	September 1993
1994	-- Submission of final report for policy study 4	November 1993
	-- Midterm external project evaluation completed	January 1994

Fiscal Year	Action	Target Date
	-- Submission of final report for policy studies 3 and 7	January 1994
	-- Submission of final report for policy study 5	February 1994
	-- Completion of public/private dialogue task 4	March 1994
	-- Completion of Environmental Risk Assessment	April 1994
	-- Introductory seminars for industrial firms targeted by ERA, GOP officials, industry associations, Chambers of Commerce	May 1994
	-- Selection of second round of participating firms	July 1994
	-- Initiate policy study 6	July 1994
	-- Initiate second round PMAs for participating firms in targeted industries (3-4 PMAs per month)	August 1994
	-- Completion of public/private dialogue tasks 3 and 5	August 1994
	-- Submission of final report for policy study 6	September 1994

D. Procurement of Goods and Services

The authorized source and origin for the procurement of goods and services will be the United States and the Philippines. However, local procurements above $250,000 for professional services, above $5,000 per transaction for goods, and above $100,000 for U.S. origin goods will require specific AID waivers. If specific requirements are identified for procurement from countries outside the authorized geographic code, a specific waiver request will be prepared for Mission consideration.

E. Contracting Arrangements

Several options are available to USAID to obtain the services necessary for IEMP. These include a competitive procurement, which could include one or more separate contracts; a cooperative agreement, which could take the form of a Mission agreement or a buy-in to a Bureau agreement; or a combination of the two. It is anticipated at this time that there will be one general contract let for project implementation services (excluding evaluation and audit services). However, the final contracting arrangements will be determined when additional information is available on potential buy-ins to AID/Washington activities, and as the specific scope(s) of work for IEMP activities are finalized.

In evaluating the feasibility of separate contracts for IEMP, it should be noted that some project elements lend themselves to separate contracts, while others do not. For example, it is recommended that a single contract be let for activities in the Pollution Reduction Initiative and the Policy Studies and Public/Private Sector Dialogue components. The activities of these

components are integrated, i.e., information developed under one activity may significantly influence work conducted under the other. It also is recommended that the training activities (Capability Building component) be provided under the same general contract, as training must be designed in response to the needs of the other components, particularly the Pollution Reduction Initiative. The completion of PMAs, the environmental risk assessment, policy studies and training could be provided by subcontracts under the general contract. Evaluation and audit services will be contracted separately.

F. Women in Development

As the project improves the industrial management of pollution for selected industries, it is expected to have a positive social impact on both its immediate beneficiaries (target firms and employees) and the residents of areas surrounding the target firms. The project's principal beneficiaries will be the individual industries and their employees, who will benefit both economically (in terms of improved firm incomes and profits) and physically (in terms of improved health conditions) as a result of more efficient operations.

The project is expected to significantly affect the large number of women employees and residents of communities surrounding the industry sites, as well as the high proportion of women NGO workers and advocacy group members. The project's monitoring and evaluation plan will provide for the collection of gender-disaggregated data to determine the extent of participation of women in project activities and the impact of the project on women beneficiaries.

G. Gray Amendment

USAID has fully considered the potential involvement of small and/or economically and socially disadvantaged U.S. enterprises for services provided under this project, and has determined that the U.S. technical assistance required under the project can best be provided through open competition. All other factors being equal, however, preference will be given to firms that submit joint proposals with Gray Amendment-satisfying firms. In addition, for the scheduled project evaluations, efforts will be made to award contracts to Gray Amendment-satisfying firms.

H. Monitoring and Evaluation

1. Project Monitoring

The project's general contractor will be responsible for day-to-day project monitoring, using as guidance the AID document Guidelines for Data Collection, Monitoring and Evaluation Plans for AID-Assisted Projects (AID Program Design and Evaluation Methodology Report No. 9). Additional monitoring oversight will be provided by USAID's ONRAD staff. Financial monitoring will be conducted by the staff of USAID's Office of Financial Management and/or a local accounting firm.

The monitoring procedures will include the collection of specified project implementation data on a quarterly basis to determine progress toward meeting

project outputs. In addition, on a regular (at least semi-annual) basis, the contractor will gather and, with DENR and USAID, analyze information to determine overall project progress under the three project components. Examples of project management reports that may be generated include:

-- Reports and analyses of PMAs conducted, including recommended improvements, expected financial and environmental benefits as a result of improvements, background information on the firms assisted, e.g., firm size, location, product/service, number of employees (including on a gender-disaggregated basis), and brief community (beneficiary) profile.

-- Reports and analyses on the financing of the PMAs, including information on the actual cost-sharing arrangements for the conduct of the PMAs.

-- Reports on the status of the PMA recommendations, including information on firms' decisions to accept (implement) or reject the PMA recommendations.

-- Status reports on the policy studies conducted and the impact of each study (major recommendations, degree of acceptance by the concerned GOP agency, and policy implementation plans).

-- Status reports on the public/private dialogue activities, including issues discussed and the impact of each dialogue (recommendations formulated, degree of acceptance by the GOP agency, and implementation plans).

-- Collection of data on the types of training provided, basic trainee information (including gender-disaggregated data), post-training follow-up, and the application of training knowledge and skills to on-the-job settings.

2. Evaluation Plan

The project implementation plan calls for the completion of a midterm (process) evaluation and a final (impact) evaluation. The midterm evaluation will focus on whether project implementation is occurring as planned and when planned, and will examine and make recommendations for the removal of any obstacles to the implementation process. In addition, the midterm evaluation will assess the need to revise the project, e.g., by adding a credit component, based on the results of the planned credit facility study and on project experience with individual firms.

The final evaluation will focus on whether the project's output- and purpose-level objectives have been met, and on an assessment of the project's overall development impact. The final external evaluation will be accompanied by a complete financial audit. Data for project monitoring and evaluation will be gathered and maintained by the project's general contractor.

Users of the Information: The major users of information generated under the project will be: the various firms and industry

associations that will benefit from project services; NGOs and residents of communities surrounding the participating firms; GOP entities such as DENR and DTI; USAID project staff; and other AID offices and country missions.

Manager's Questions: Following are the priority evaluation questions at the goal, purpose and output levels:

-- **GOAL LEVEL:** To what extent has the project contributed to an increase in regional output per capita in the geographic areas where PMAs were performed? To what extent has the project contributed to a decrease in industrial pollution-related absenteeism among employees in the geographic areas where PMAs were performed?

-- **PURPOSE LEVEL:** What percent of the firms receiving PMAs have adopted the PMA recommendations? Why, or why not, were these recommendations adopted? Have production costs been reduced for the firms participating in PMAs? By how much have production costs decreased or increased? Has there been a decrease in industrial pollution at the firms participating in PMAs? By how much has industrial pollution decreased or increased at these firms?

-- **OUTPUT LEVEL:** Was an environmental risk assessment completed, and were at least five high-risk industry sectors identified and prioritized for further project intervention? Was this information provided to DENR for their action? How many PMAs were completed? Were the results of the PMAs appropriately disseminated to industry associations and community groups? To how many firms was follow-up technical assistance provided? How many policy studies were completed? Are their recommendations being implemented? How many public/private fora were conducted? Are their recommendations being acted upon? What types of training have been provided? How many individuals have received training? Do follow-up surveys indicate that the training was useful? What have the participants remembered/used?

Key Indicators: Key indicators for assessing project performance could include the following:

-- **INDUSTRIAL FIRMS:** Numbers of firms asking to participate in IEMP; physical measures of reduced pollution by participating firms; cost savings, added revenues, and other financial payoffs from by-product use or sale; financial liability avoided because of greater pollution prevention and reduction; evidence of spread effects beyond participating firms; and improved goodwill by surrounding communities toward firms that have improved pollution management.

-- **GOVERNMENT:** Numbers of policy analyses and public/private dialogues that lead to improved social conditions; advances in DENR's skills as indicated by new/added responsibilities of staff, improved data bases on industrial pollution; and various measures of agency effectiveness in dealing with polluting industries.

-- **OTHER:** Reduced downstream damage to crops, fisheries, tourism and other income-generating sectors; and improved ecosystem health at sites downstream of project sites. Performance indicators and their means of verification are summarized in Table 2 below.

TABLE 2
PERFORMANCE INDICATORS AND MEANS OF VERIFICATION

INDICATOR	BASELINE SOURCE	VERIFICATION SOURCE
Increases in income or decreases in costs for firms participating in PMAs	PMA data and ex ante feasibility studies	PMA follow-up surveys and ex post feasibility studies
Decrease in pollution-related absenteeism among employees at firms participating in PMAs	PMA data and Department of Labor and Employment reports	PMA follow-up surveys and DOLE reports
Spread effects Beyond participating firms	Information from trade associations, DENR data and Board of Investments data	Post-PMA survey of selected industrial firms and BOI data
Reduction in pollution from firms participating in PMAs	PMA data and company monitoring records	PMA follow-up surveys and company monitoring records
Adoption of pollution prevention and reduction equipment and methods by firms participating in PMAs	PMA and DENR data	PMA follow-up surveys
Improvements in materials management and cost savings for PMA firms	PMA data	PRA follow-up surveys
Greater awareness and participation by NGOs and the public in industrial environmental management and DENR decision-making	Number of registered NGOs and number of NGOs commenting on DENR rule-making actions	Number of local oversight committees formed
Effectiveness of capability building component	Pre-training evaluation forms	Post-training evaluation forms

I. Environmental Concerns

An Initial Environmental Examination (IEE) was completed and included in the Project Identification Document (May 1991). The IEE recommended a negative determination based on the criterion that the project is designed to produce significant improvements in environmental conditions in the Philippines by helping industries and government agencies solve problems of industrial wastes and residues. In this recommendation, it is understood that if USAID chooses to provide assistance in implementing recommendations originating with project-funded environmental management appraisals, the management appraisals will be used as IEEs to determine whether further impact analysis is required under AID regulations. The project in its final design has not changed significantly in its expected environmental impact. Therefore, the IEE recommendation remains valid. The IEE is attached as Annex E.

IV. FINANCIAL PLAN

A. Cost Estimate and Financial Plan

The total cost of the project to USAID is estimated at $20 million. The estimated life of project cost by source of funds is summarized in Annex H under the Illustrative Financial Plan (Table 1) and Summary Cost Estimates and Financial Plan (Table 2). Tables 3 and 4 present the Planned Yearly Obligations and Expenditures and the Projected Expenditures by Fiscal Year and By Project Element, respectively.

1. USAID Contribution

USAID will provide $20 million in grant funding from the Special Assistance Initiative (SAI) funds. Planned yearly obligations are shown below:

AID PLANNED YEARLY OBLIGATIONS
($000)

FY 91	FY 92	TOTAL
$5,000	$15,000	$20,000

2. Contributions of GOP and the Private Sector

GOP and private sector contributions to the project will be primarily in the form of logistical and administrative costs to support contractors, salaries of government and private sector participants during training; and most of the local and foreign plane fare and other related travel costs of participants. In addition, they are expected to provide office space, training venues, furniture and utility costs in support of project activities.

USAID policy emphasizes the importance of host country counterpart contributions; however, there is no requirement for a minimum 25 percent host country contribution under Section 110 of the Foreign Assistance Act. Since the project's beneficiaries are primarily from the private sector, with GOP participation a secondary objective, GOP support to project activities will focus on ensuring that DENR has the necessary resource levels, including staffing, to carry out project activities.

B. Methods of Implementing and Financing

The project will use the direct payment disbursement method. Under this method, USAID may make direct payments to suppliers or contractors for goods and/or services delivered upon presentation of invoices and other specified documents. Table 3 on the following page presents the implementation and financing methods for each project component.

TABLE 3
METHODS OF IMPLEMENTATION AND FINANCING

Project Element	Implementation Method	Financing Method	Amount ($000)
Pollution Reduction Initiatives	AID Direct Contract	Direct Payment	13,000
Policy Studies, Public/Private Dialogue	AID Direct Contract	Direct Payment	2,800
Capability Building	AID Direct Contract	Direct Payment	3,700
Evaluation and Audit	AID Direct Contract	Direct Payment	500
		TOTAL	20,000

C. USAID Flow of Funds

Once funds are obligated for the project, earmarking, commitment and disbursement will follow, depending on the project's pace of activity. Flow of USAID funds will be subject to standard rules and regulations, as indicated in Section IV.B. All foreign exchange costs under AID direct contracts or sub-project grants will be paid directly by USAID.

D. Audit

The basic and essential scope of responsibilities of project implementors, i.e., financial management, includes funding, custodial, analytical, record-keeping and reporting functions among its major elements. It is in this context that any project should be monitored, evaluated and audited to ensure its success.

Primary responsibility for audits of USAID-funded projects lies with the Regional Inspector General's Office. Non-federal audits are normally contracted to independent certified public accounting firms. The amount of $200,000 is budgeted for technical reviews and evaluations, while $300,000 is budgeted for financial monitoring and audits. At some point during project implementation, the services of an external financial monitor may be necessary to provide independent and objective financial oversight of the project. Analyzing and assessing the financial impact of management decisions both before and after implementation or completion is necessary in order to know the status of the project, the capabilities of implementors, and how much or

what is the status of funding requirements. Therefore, ongoing monitoring and the midterm (process) and final (impact) evaluations are expected to include the following project management concerns:

1. Assessment of Contracting Capabilities (continuous)
2. Assessment of Financial Management System (continuous)
3. Technical Monitoring (midterm)
4. Technical Evaluation (midterm/final)
5. Financial Monitoring/Audits (midterm)
6. Project Financial Close-Out (final)

E. Recurrent Costs

Any project's sustainability can be gauged by the ability of the implementing entity (GOP and the private sector) to finance from its own funds or other non-AID sources the recurrent costs and other future obligations that may be incurred after the project life. Recurrent costs are operating expenditures needed to carry out further project activities. They include wage and salary payments, utility costs, raw material purchases, maintenance and repair expenses, replacement costs of worn-out equipment, debt service payments, etc.

As the GOP or private sector participants are expected to be adequately equipped (via training and "hands on" experience) throughout the various phases of the project, sustainability of the project as far as human resource expertise is not a problem. It is important, however, for the implementing agencies to be able to finance continuing or recurrent costs to sustain project activities after the project's completion.

The project's policy studies and capability building activities are not expected to continue after the life of the project. Should the GOP wish to continue these activities after project completion, alternative sources of financing will be required, e.g., through DENR budget allocations or other donor financing, as the activities are not considered to be self-sustaining. Activities in the Pollution Reduction Initiatives component -- i.e., PMAs and technology transfer activities -- and the public/private dialogues are expected to continue after the project's completion, and thus have recurrent cost concerns.

The GOP counterpart contribution for these activities will be primarily through the provision of logistical and administrative support to contractors and through participation of GOP staff in training activities and the public/private dialogues. Therefore, recurrent costs for the GOP are expected to be minimal, and will be handled through the usual GOP budgetary process.

Recurrent costs for private sector participants (individual firms, industry associations and NGOs) are expected to be incurred for the completion of PMAs for new firm participants; follow-up audits for IEMP firm participants; technology transfer (upgrading of technology and production methodologies) for both "old" and "new" firms; and participation in on-going public/private dialogues.

It is anticipated that industry associations will assume coordination of PMAs for their member firms, and that the associations will consider limited cost-sharing for the conduct of PMAs for smaller firms. Since one purpose of the project is to demonstrate the financial benefits to firms as a result of completing PMAs and implementing PMA recommendations, it is expected that, by the end of the project, "new" participating firms will be willing to finance their own PMAs and the implementation of the PMA recommendations. "Old" firms should be able to finance follow-up PMAs and technology upgrading from the cost savings generated as a result of earlier PMAs and upgrading activities. Project evaluation may be one of the tools by which cash flows and financial structures of the GOP or private sector involved are looked into to ensure the sustainability of key project activities.

V. SUMMARY OF ANALYSES

A. Technical Analysis

The Technical Analysis (Annex G) presents the technical rationale for determining the project's approach, selecting its components, and describing how the various components are integrated to achieve the project's goals. The ultimate objective of the project is to reduce pollution from industrial sources, thereby improving the health of the people and the quality of the environment. The resources required to accomplish this are far greater than the resources currently available from the GOP or from this project. Yet the proposed approach helps the GOP make progress by providing both industry and the GOP with some useful tools to begin reducing the amount and hazard of industrial wastes.

In considering how USAID assistance could be most effective, two alternative approaches were considered. These approaches are:

1. Providing incentives for industry to voluntarily reduce the amount and hazard of pollutants.

2. Assisting the GOP to establish priorities for utilizing its limited budgetary and human resources.

These two approaches were chosen as the most appropriate and cost effective, thus, they form the focus of most project activities. In particular, a major technical component of the project provides technical assistance to industry in finding ways to voluntarily improve efficiency and generate less pollution. At the same time, the project team works with government personnel in identifying those sources of industrial pollution that represent the greatest risk to human health and the environment.

Through the project, both industry and the GOP are provided tools necessary to evaluate and identify cost-effective methods of reducing or preventing industrial pollution. The primary tools proposed are pollution management appraisals for use by industry and environmental risk assessments for use by the GOP.

The project proposes to help industry conduct pollution management appraisals for their facilities and follow through on the resulting recommendations with appropriate forms of technology transfer. The objectives of these appraisals are to: improve process efficiency; reduce the amount and hazard of wastes; identify opportunities to reuse, recycle, or reclaim by-products; and identify practical steps in waste management. The benefits for industry are expected to generate voluntary industry participation.

Concurrently, the GOP will be assisted in conducting environmental risk assessments. The purpose of these assessments is to identify industries and industrial sectors that warrant high priority in pollution reduction and prevention.

Training, policy studies, and similar parallel and follow-up activities create a sustainable capability within both industry and government to use these tools beyond the project life. Training will be provided for government, industry, industry associations and NGOs. Government trainees will include DENR staff from central and regional offices, DTI staff, and environmental officers from local governments. Trainees from the private sector will include pollution control officers representing industries and industry associations, as well as local consultants.

As pollution reduction appraisals and other components of the project are carried out, policy-related factors that influence effective pollution reduction will be identified. These factors and their effects on voluntary industry action will be the topics of policy analyses. At the same time, IEMP will seek to expand and sharpen public/private dialogue regarding industrial pollution, particularly with respect to better communications between the numerous public and private parties affected by industrial pollution.

B. Economic Analysis

Pollutants are unwanted byproducts of industrial processes, generating costs defined according to several alternative accounting frameworks. Costs accrue to individuals directly in the form of decreased availability or impaired quality of desired goods and services, or indirectly through decreased production efficiency in industrial plants and the economy at large. Certain categories of costs are reflected in market prices, while other very important costs are external to market systems.

While present cost accounting systems can be applied in the analysis of social, economic and other indirect costs of pollution, the information required may not be available (e.g., pollutant dose-response relationships, incidence of cost-bearing, behavioral adjustments in the presence of pollutants). If ever available, these estimates, their methodology, etc. do not inspire confidence among users. Analytical capacity, therefore, based on cost accounting methodologies is limited given present gaps in knowledge and information on key pollution parameters.

These deficiencies are particularly pronounced in the Philippines, where efforts to understand and control industrial pollutants are recent and underdeveloped. Nevertheless, it is possible to make informed judgments about the relative importance of different categories of impacts and costs. Each of the following is believed to be an important component of pollution-related economic losses in the Philippines:

-- Illness and premature death.

-- Reduced productivity of farming, forestry, and fisheries.

-- Adverse effects on ecological systems; and

-- Increased costs to industries and residences in the form of materials damage, lowered property values, and increased cleaning and maintenance.

In the Philippines, the legal framework for pollution management is extensive, although not always appropriate. Truly significant gaps are found in monitoring, regulations, and enforcement provisions. To complement the legal and regulatory approaches now in use, the project will give considerable attention to voluntary and market-based efforts. The project's policy analyses will explore cost sharing of waste disposal facilities, tax credits, tariff exemptions on pollution control equipment, revised penalty fees, effluent taxes, marketable discharge permits, deposit-refund programs, and other economic instruments as market-based alternatives to the purely regulatory approach.

The economic benefits of the project are examined in terms of three contributions:

-- Cost savings to agro-industries and other industries resulting from the project's pollution reduction appraisals and ensuing changes in processing efficiency and waste handling.

-- Improvements in fisheries productivity because of reduced water pollutants; and

-- Health benefits in communities where the project helps reduce pollutants.

While various other categories of project benefits could be included in the analysis, these three are sufficient to justify the investment. At a discount rate of 10 percent, the project's net benefits are $5.0 million for cost savings to industries plus $44.7 million for fisheries and health, for a total of $49.7 million. At a discount rate of 15 percent, net benefits are $3.6 million plus $8.6 million, respectively, for a total of $12.2 million. Thus the project is economically viable under present assumptions, but is highly sensitive to the discount rate. It is also important to note that pollution reduction has a social payoff substantially greater than financial gains to industries, as the current estimations demonstrate.

C. Financial Analysis

As a non-revenue earning project, measurable cost-benefit analysis may not be applicable as only the costs are easily quantified while the benefits are in the form of "intangibles" such as:

a. probability of producing positive financial return;
b. increased efficiency of operation and reduction in waste disposal;
c. sustained economic growth in the industrial sector, with corresponding improvements in health status.

A case study was made for a piggery in General Santos City to identify opportunities for reducing levels of pollution within the agribusiness sector. Two potential improvements were identified and examined vis-a-vis the effect of different interest rates on the financial viability and attractiveness of the potential undertaking. The study revealed that with the construction of a duck yard and diversion of wastewater through this yard, there would be a

reduction in the dry waste content of the wastewater by 30 percent and an internal rate of return (IRR) of 28 percent (at 24 percent interest rate) and 35 percent IRR (at 12 percent interest rate). Cost recovery would take approximately 3 years.

Another improvement involved the construction (which will eliminate the pollutants from wastewater) of a digester with three treatment ponds and a gas storage facility. The financial benefits will be in the form of savings from the purchase of fuel and the IRR will be 51 percent (at 24 percent interest rate) and 58 percent (at 12 percent interest rate). Cost recovery would likewise take approximately 3 years.

The overall improvement in the IRR, assuming both improvements were implemented, will be 15 percent (at 24 percent interest rate) and 16 percent (at 12 percent interest rate). Cash flows will likewise improve from the present 20.2 million Pesos to 27.7 million Pesos (at 24 percent interest rate) and 30.0 million Pesos (at 12 percent interest rate). Therefore, with the implementation of the pollution reduction method identified for the piggery, the overall financial operation will be further improved while at the same time support the efficient management of industrial waste.

D. Social Soundness Analysis

The project's outputs will involve technical assistance in pollution reduction; identification of investment opportunities; the transfer of technology; training; policy analysis; and public/private dialogues. The social soundness analysis focuses on the compatibility of the project design with the culture of the beneficiaries, beneficiary participation, spread of benefits and equitable distribution among socio-political groups, and project sustainability.

1. Project Beneficiaries

The principal beneficiaries of the project will be the individual industrial firms, their employees and the surrounding communities. The project will improve the health and the quality of life of people and promote the survival of those ecological systems that sustain human life.

The relevant issues pertaining to the beneficiaries are the effects of pollution on human health, community mobilization in reaction to industrial pollution, and the socio-cultural system of the industry. One of the studies done in the Philippines regarding the effects of pollution on human health indicates that a majority of the "gold rush" small scale miners in Mindanao have been affected by exposure to mercury. Other examples indicate that there is a high rate of respiratory diseases among schoolchildren located near a coal conversion plant. Upper respiratory infections are also common for those working in semiconductor industries.

Where industrial pollution has destroyed fish and agricultural habitats and has threatened the health and safety of communities, there has been an increase in environmental activism from peoples' organizations and NGOs. Examples of such protests involving NGOs' successful mobilization of

communities are Lingkod Tao-Kalikasan's opposition to Marcopper Mining Corporation for dumping its mine tailings into Calancan Bay; the halting of an incineration scheme in Iligan City that would have caused the emission of pollutants; and a campaign against smoke-belching vehicles in Metro Manila.

2. Socio-Cultural Compatibility and Project Design

The project is attempting to overlay industrial management techniques and technologies on Philippine industrial culture. It is necessary, therefore, that the socio-cultural characteristics of the industry and those communities around the industry be understood by the project proponents.

The Philippine industrial scene is dominated by Filipino-Chinese, Filipinos and foreigners. There are distinct differences between Filipino-Chinese-owned companies and Filipino-owned companies. There are more non-family owned companies among Filipinos than Filipino-Chinese. In business ventures, Filipinos are able to cross family lines more easily than the Filipino-Chinese. This is attributed to the basic organizational structure of Philippine society, which is the bilateral kinship group with ritual kin. Human interactions which focus on social and economic reciprocal relationships expand beyond the bilateral group to form distinct groups. What evolves is a group distinct from other groups, and within such an organization is a hierarchy of persons with socio-political power and authority. These same processes take place within Filipino-owned industrial companies and the NGO network system.

NGOs are a sector focal point in many of the issues pertaining to environmental awareness and advocacy. The organizational linkages between the private and public sectors already have been effectively mobilized by the NGO sector, thus the beneficiary communities should be receptive to the project design. The organizational structure that will lead the receptiveness of project design is already in place.

3. Beneficiary Participation

Because of the successful efforts of NGOs in increasing awareness in the environmental sector, there will be those communities near industry that will be receptive to project participation. There are also industry models of indigenous technology that have successful pollution reduction systems. These models will provide industry with incentives to participate in the project as they demonstrate the successful research and development efforts of local industry.

The main social and political constraints for this project will be based on the ethnicity of the companies being targeted; the presence of conflict or hostility between industry and the community; and the non-participation of vital subsectors of the public and private sector that can make an impact on better environmental management for pollution reduction initiatives.

4. Spread of Benefits and Equitable Distribution

Besides improving the health and the quality of life of communities around industry, the long term benefits of reducing pollution will ensure the survival of those ecological systems that sustain human life. The survival of these ecological systems necessary for ultimate human survival cross-cuts sex, age, ethnicity, social and political groups. Benefits are equitably shared by all.

The project can be replicated in other areas, and the benefits will spread if social and political barriers are overcome and industry will see an increase in gross income and net profit. The multisectoral approach of the project to include industry, government and the local community will allow these sectors to work together in a less adversarial relationship to solve their shared problems.

5. Sustainability

Successful indigenous technologies presently being used must be identified and applied. Tapping these local resources in terms of personnel and technology will enhance project participation and contribute to the continuity and sustainability of project activities.

The organizational structure that is evolving within the intersectoral groups has its roots in the socio-cultural organization of Philippine culture. The examples discussed in Annex J illustrate the interactive mechanisms that take place with the organizational structures of various groups. This is especially true in the public/private dialogue and in the availment of technical training and institution building in each of these organizations' environmental concerns. Therefore, in addressing industrial pollution, the public sector, through DENR, DTI, and LGUs, and the private sector, through industry, NGOs and citizen participation, should continue to be active participants throughout the project's implementation. Active participation by these sectors is necessary for the sustainability of project activities.

Moreover, successful implementation of project outputs in the reduction of pollution will sustain those ecological systems vital to the survival not only of Filipinos but to humans as a whole.

E. Administrative Analysis

The GOP/DENR management structure for IEMP builds upon the institutional capabilities that are currently being employed. This management structure will consist of a project team, steering committee and working groups that are being formed. Within this structure, a project coordinator will be responsible for day-to-day project management. This management framework will provide continuity to the efforts of the GOP to formulate and implement projects in environmental management.

Besides DENR, the primary counterpart agency of the GOP for IEMP, numerous other entities will be involved either as project participants or beneficiaries. Among them are DTI, Chambers of Commerce, industry

associations, professional associations -- e.g., the Pollution Control Association of the Philippines, Inc. (PCAPI), and other groups identified during the course of the project. These entities may participate on a steering committee formed by DENR. Other groups and individuals will form working groups to provide the project with technical support during project implementation.

The management structure proposed will provide continuity and breadth, but GOP budget and personnel constraints should not be overlooked. The resource constraints at DENR, in particular, are serious. Among these constraints are shortages of staff and support funds. This has been exacerbated by recent cuts in DENR budget and management staff.

The staff at DENR/EMB is sufficient in number to support IEMP, notwithstanding shortages of persons specifically trained in some of the disciplines appropriate to industrial environmental management. The lack of access to analytical instruments -- e.g., to assess the chemical properties of pollutants -- may require project support to overcome in the short term. The project will examine long-term solutions to the shortages of facilities and equipment.

There are relatively few professional and technical personnel external to DENR who are qualified in issues of industrial environmental management. PCAPI has approximately 300 corporate and individual members, many of whom are pollution control officers in industrial firms. IEMP, through its training and technical assistance activities, seeks to broaden the numbers and capabilities of those engaged in, or entering the field of, environmental management.

VI. CONDITIONS, COVENANTS AND WAIVERS

A. Conditions Precedent to Disbursement

1. First Disbursement

   a. An opinion of the person holding or acting in the Office of the Secretary of the Grantee's Department of Justice that the Grant Agreement has been duly authorized or ratified by and executed on behalf of the Grantee, and that it constitutes a valid and legally binding obligation of the Grantee in accordance with all of its terms.

   b. A statement of the name and title of the person holding or acting in the office of the Grantee and of any additional representatives, together with a specimen signature of each person specified in such statement.

2. Additional Disbursement for New Activities in Each Project Year: An implementation plan for the activities to be funded in that Project year.

B. Special Covenants

1. Adequate Staffing: The Grantee agrees to maintain adequate staffing levels within the Environmental Management Bureau (EMB) of the Grantee's Department of Environment and Natural Resources to carry out the Project.

2. Project Evaluation: AID and the GOP agree to establish an evaluation program as part of the Project. Except as AID and the GOP otherwise agree in writing, the evaluation program will include, during the implementation of the Project and at one or more points thereafter:

   a. Evaluation of progress toward attainment of the objectives of the Project.

   b. Identification and evaluation of problem areas or constraints that may inhibit such attainment.

   c. Assessment of how such information may be used to help overcome such problems; and

   d. Evaluation, to the degree feasible, of the overall development impact of the Project.

C. Waivers

Except with relevance to the "Buy America" requirements as outlined earlier, at this time no waivers are anticipated under the project.

ANNEX A

LOGICAL FRAMEWORK

LIFE OF PROJECT:
From FY 1991 to FY 1996
Total U.S. Funding $20,000,000
Date Prepared: September 11, 1991

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title and Number: Industrial Environmental Management (492-0465)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
(A-1) Program or Sector Goal: The broader objective to which this project contributes: To encourage sustained economic growth in the industrial sector, with corresponding improvements in health status.	**(A-2) Measures of Goal Achievement:** – Est. 2 to 5 percent increase in regional output per capita in geographic areas where pollution management appraisals (PMAs) are performed. – Est. 2 to 5 percent decrease in industrial pollution-related absenteeism among employees in geographic areas where PMAs are performed.	**(A-3)** – DTI statistics, reports. – Board of Investments data. – DOH statistics, reports. – PMA follow-up surveys.	**(A-4) Assumptions for achieving goal targets:** – GOP policies encouraging an active private sector role in economic growth will continue. – GOP policies endorsing voluntary industry actions to reduce pollution will continue. – Political environment, law and order conditions remain stable. – Improved pollution management will lead to economic growth. – Reduction in industrial pollution will lead to improved health status.
(B-1) Project Purpose: To improve industrial management of pollution through: (a) preventing or reducing pollution at its sources; (b) reclaiming industrial wastes; and (c) encouraging cost-effective pollution abatement technologies.	**(B-2) Conditions that will indicate purpose has been achieved: End-of-Project Status.** – Adoption of pollution prevention and reduction equipment/methods by approx. 50 % of the firms that received PMAs. – Approx. 5 to 10 percent reduction in production costs at firms participating in PMAs. – Est. 5 to 10 percent decrease in industrial pollution at firms participating in PMAs.	**(B-3)** – PMA follow-up surveys. – DENR, independent pollution monitoring. – DTI, Chamber of Commerce reports. – DENR, LGU performance reports and independent verification.	**(B-4) Assumptions for achieving purpose:** – GOP will act on recommended industrial environmental policy and regulatory changes. – Training will lead to improved public and private sector performance in envir. monitoring and planning. – Private sector will seize new business opportunities in industrial environmental management. – Funding is available for industries to replace/upgrade equipment and install new processes.
(C-1) Project Outputs: 1. Environmental risk assessment (ERA) to identify high-risk industrial sectors. 2. Facility-specific pollution management appraisals (PMAs). 3. Policy studies on constraints to improved industrial pollution management and on voluntary industry action. 4. Improved public/private dialogue on environmental management issues. 5. Training in PMAs, ERAs, env. impact assessments, compliance audits, compliance monitoring, data collection/sampling.	**(C-2) Magnitude of outputs:** 1. ERA completed, and 5 high-risk industry sectors identified. 2. Completion of up to 150 PMAs. 3. Approx. ten policy studies completed. 4. Five public/private fora held on ind. env. mgmt. issues. 5. Approx. numbers of participants: PMA (200); ERA (60); EIA (700); compl. audit (200); compl. mon. (200); data collection/analysis (300).	**(C-3)** – Project records and quarterly/annual reports. – Completed ERA, PMAs and policy studies. – Contractor records and reports. – GOP reports. – Forum proceedings and recommendations. – Post-training evaluation forms.	**(C-4) Assumptions for achieving outputs:** – Industrial firms are willing to participate in PMAs. – Appropriate training opportunities can be identified. – Private sector firms willing to participate in cost-sharing. – Interest, demand for voluntary pollution control measures can be tapped.
(D-1) AID Project Inputs: 1. Pollution reduction initiatives 2. Policy studies and public/private dialogue activities 3. Capability building 4. Evaluation and audit AID TOTAL	**(D-2) Implementation Target (Type and Quantity):** ($000) 13,000 2,800 3,700 500 20,000	**(D-3)** – USAID financial records. – Reports from contractors. – Independent audits.	**(D-4) Assumptions for providing inputs:** – Availability of AID funds over the life of the project.

ANNEX A

ANNEX B

GOP LETTER OF REQUEST

NATIONAL ECONOMIC AND DEVELOPMENT AUTHORITY
NEDA sa Pasig, Amber Avenue Pasig, Metro Manila

Cable Address: NEDAPHIL
P.O. Box 419, Greenhills
Tels. 631-0945 to 64

SEP 18 1991

Mr. Malcolm Butler
Mission Director
U.S. Agency for International Development
Ramon Magsaysay Center
Roxas Blvd., Manila

Dear Director Butler:

We wish to convey the request of the Government of the Philippines (GOP) for $20 million USAID grant assistance to finance the proposed Industrial Environmental Management Project (IEMP). The five-year project aims to encourage sustainable economic growth in Philippine industries, with corresponding improvements in human health and environmental quality. To be implemented by the Department of Environment and Natural Resources (DENR), the project will support one of the major strategies of the Philippine Strategy for Sustainable Development by directing efforts at the reduction of industrial pollutants at minimum private and social costs.

Close GOP and USAID consultations on the finalization of the project design are on-going. It is hoped that the proposed project can be presented for review by the ICC-Technical Board and the ICC-Cabinet Committee on 19 September 1991 and 23 September 1991, respectively. Negotiations on the Grant Agreement can proceed simultaneously during the week of 23 September 1991 on the understanding that execution of the final Project Agreement will be contingent on the NEDA Board's approval of the proposed project hopefully by 25 September 1991.

In view of the project's potential contribution to the GOP's efforts at minimizing environmental damage arising from industrial pollution, we shall highly appreciate USAID's favorable consideration of this request for grant assistance.

Thank you and best regards.

Very truly yours,

CAYETANO W. PADERANGA, JR.
Director General and
Secretary, of Socio-Economic Planning

cc: Sec. Fulgencio S. Factoran, Jr., DENR
Asst. Sec. Delfin Ganapin, Jr., DENR

DIV	ACT	INF
OD		✓
OPE		
OLA		
PESO		
CSO	✓	
DRM		
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DUE DATE		
10-1-91		

ACTION TAKEN
RAN Other as stated in Project Paper
Type No.
Date 9/25/91 Initials

Received in DRM 9/25/91
Clearance Action Log 403
Document No.
Assigned to PC

-41

ANNEX C

NPD APPROVAL CABLE

ACTION: AID-3 INFO: AME DCM AA ECON RA/E

ANNEX C

VZCZCMI0314
RR RUEHML
DE RUEHC #9019 2192430
ZNR UUUUU ZZH
R 0704272 AUG 91
FM SECSTATE WASHDC
TO AMEMBASSY MANILA 0496
ET
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07-AUG-91 TOR: 04:31
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TAGS:
SUBJECT: URBAN AND INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROJECT (492-0465) - NPD APPROVAL

1. AA/APRE APPROVES THE NEW PROJECT DESCRIPTION (NPD) FOR THE URBAN AND INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROJECT AND DELEGATES TO THE MISSION DIRECTOR APPROVAL OF ANY PROJECT IDENTIFICATION DOCUMENT (PID) FOR THIS PROJECT. WE ASK THAT THE MISSION ADVISE US HOW THE MAIN POLICY QUESTION, THE APPROACH TO REGULATION, DESCRIBED BELOW IS RESOLVED. WE ARE ALSO CONCERNED THAT FY 1991 OBLIGATION IS PLANNED BY PRIOR ARRANGEMENT WITH AID/W; WE NOW PREFER THAT YOU DEFER FINAL DESIGN UNTIL YOU ARE SATISFIED YOU HAVE HAD A REASONABLE OPPORTUNITY TO ADDRESS THE SIGNIFICANT DESIGN ISSUES.

DIV	ACT	INFO
OD		✓
OPE		✓
OLA		✓
PESO		
CSO	✓	
DRM		
EXO		
A/EXO		
PROC		
HRD		
C&R		
DND		
CMD		
GSO		
TRV		
OFM		
OCP		✓
ONRAD		
OPHN		
OFFPVC		
RAO/M		
RIG/I		
DUE DATE		
8-15-91		

2. THE BUREAU REVIEW JULY 23 ATTRACTED A NUMBER OF COMMENTS FROM INTERESTED OFFICES IN PPC, S AND T AND APRE BUREAUS; ALL OF THEM HAVE BEEN OR WILL BE SENT TO THE MISSION (ONRAD). THE MAIN POLICY QUESTION REVIEWERS ENCOUNTERED WAS WHETHER IT IS REASONABLE TO EXPECT THE INDUSTRIAL SECTOR TO UNDERTAKE VOLUNTARY PREVENTATIVE MEASURES WITHOUT A SIGNIFICANT EFFECTIVE REGULATORY

PUSH. REVIEWERS BELIEVED THAT ECONOMIC INCENTIVES AND REGULATION ARE COMPLEMENTARY ISSUES AND THAT BOTH MAY BE NECESSARY FOR A PROJECT OF THIS NATURE TO WORK. THE EMPHASIS TO BE PLACED ON ONE OR THE OTHER SHOULD BE A CONSIDERATION IN YOUR DESIGN EFFORT.

THE NPD AND THE MAY, 1991 SURVEY ON WHICH THE NPD WAS BASED PROVIDED A RICH MENU OF POSSIBLE INTERVENTIONS ON THE SIDE OF INCENTIVES FOR VOLUNTARY COMPLIANCE, BUT LEFT OPEN HOW THE PROJECT WILL ADDRESS THE REGULATORY POLICY TO BE FOLLOWED. E.G., WILL HIGH REGULATORY STANDARDS WHICH MAY BE IMPOSSIBLE TO ACHIEVE CONTINUE, OR WILL A POLICY OF BLENDING REASONABLE STANDARDS WITH INCENTIVES BE SOUGHT? CAN UNCERTAINTIES ABOUT REGULATORY STANDARDS BE REMOVED SO INDUSTRY WILL HAVE CONFIDENCE THAT ITS ATTEMPTS TO COMPLY WILL SATISFY REGULATORS? WHAT WOULD BE THE ROLE OF DENR IN THIS PROJECT GIVEN ITS POLICY AND REGULATORY MANDATES?

ACTION TAKEN
Date Cable No.
Type No.
Date Initials

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3. WE UNDERSTAND THAT ADDRESSING THIS AND OTHER ISSUES IN THIS FIELD WILL NOT BE EASY. WE SUGGEST THAT THE PROJECT PROCEDE-BY STEPS, PERHAPS STARTING IN A SPECIFIC INDUSTRY GROUP OR A LOCAL AREA (PERHAPS THE MINDANAO PROJECT AREA) TO DETERMINE WHAT APPROACHES ARE MOST PRODUCTIVE, PHASING OF THE PROJECT IN TWO STAGES, WITH THE FIRST PHASE ORIENTED TOWARD BETTER DEFINITION OF THE SPECIFIC ISSUES TO BE ADDRESSED IN A PHASE 2.

4. WE WILL CONTINUE TO SEND YOU (ONRAD) ANY FURTHER INFORMATION ON RELEVANT EXPERIENCES ELSEWHERE AND THE CHANGING STATE OF THE ART IN THIS FIELD THAT WE CAN DEVELOP, INCLUDING THE HIERARCHY OF POLLUTION LIMITING PROTOCOLS FOR BOTH EXISTING AND NEW INDUSTRIAL PLANTS. WE WOULD APPRECIATE YOUR INFORMING THE BUREAU ENVIRONMENTAL STAFF (APRE/DR/TR) WHEN FINAL DESIGN DECISIONS ARE REACHED SO THEY CAN FIELD THE LIKELY INQUIRIES FROM THE ENVIRONMENTAL COMMUNITY, AND THE HILL.

5. AN INITIAL ENVIRONMENTAL EXAMINATION IS REQUIRED. PLEASE SEND TO M. KUX, APRE/DR/TR AS EARLY AS POSSIBLE WHEN DESIGN IS MORE FULLY FLESHED OUT. THANK YOU.
BAKER
BT
#9019

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ANNEX D

GRAY AMENDMENT CERTIFICATION

ANNEX D: CERTIFICATION PURSUANT TO THE UTILIZATION OF GRAY AMENDMENT ORGANIZATIONS

I, Malcolm Butler, Director of the Agency for International Development in the Philippines, have fully considered the potential involvement of small and/or economically and socially disadvantaged enterprises, and do hereby certify that in my judgment the U.S. technical assistance required under this project can best be provided through open competition. All other factors being equal, however, preference will be given to firms that submit joint proposals with Gray Amendment-satisfying firms. In addition, for the scheduled project evaluations, efforts will be made to award contracts to Gray Amendment-satisfying firms. My judgment is based on the recommendations of the Project Team and Mission Review Committee.

Malcolm Butler
Director, USAID/Philippines

ANNEX E

INITIAL ENVIRONMENTAL EXAMINATION

ANNEX E

INITIAL ENVIRONMENTAL EXAMINATION

A. COUNTRY: Republic of the Philippines

B. ACTIVITY: Urban and Industrial Environmental Management Project (492-0453)

C. TOTAL AID FUNDING: $20,000,000

D. LIFE OF PROJECT: FY 1991 to FY 1996

E. STATEMENT PREPARED BY:

Patricia L. Jorden
Office of Development Resources Management
USAID/Philippines

F. ENVIRONMENTAL ACTION RECOMMENDED: Negative determination in accordance with 22 CFR Part 216, Section 216.3(a)(3)(iii).

G. ENVIRONMENTAL OFFICER'S CLEARANCE:

Kevin A. Rushing
Office of Natural Resources, Agriculture and Decentralization, USAID/Philippines

H. USAID/PHILIPPINES DIRECTOR'S DECISION:

APPROVED:

DISAPPROVED:

DATE: AUG 5 1991

I. ASIA BUREAU ENVIRONMENTAL COORDINATOR'S DECISION:

APPROVED: All box, APREDE

DISAPPROVED:

DATE: Sept. 10, 1991

EXAMINATION OF THE NATURE, SCOPE AND MAGNITUDE OF THE ENVIRONMENTAL IMPACT

A. Project Description

The project is designed to produce significant improvements in environmental conditions in the Philippines by working with the private sector to solve problems related to the management of industrial by-products and residues. The project proposes to accomplish this task by eliciting industry support and cooperation in environmental management appraisals and risk assessments; by providing public and private sector training in risk assessment and the conduct of environmental management appraisals; and by supporting policy studies when management appraisals reveal regulatory and policy obstacles to private sector management of wastes.

ENVIRONMENTAL MANAGEMENT APPRAISALS: The purpose of the project is to improve the rates of reclamation, recovery and recycling of by-products and residues that are now dumped as wastes. Environmental management appraisals are expected to play a key role in meeting this objective. Efforts to reclaim, recover and recycle wastes, although ultimately designed to benefit the environment, may require environmental review and assessment regarding indirect effects (connected actions). Examples of such connected actions include the transport of potentially hazardous waste from one site to another for use, or shifting the ultimate discharge of pollutants from one medium (e.g., water) to another (e.g., air). An important component of the environmental management appraisals is an analysis of the environmental and economic implications of recommended changes in practice.

Environmental management appraisals that are properly and thoroughly prepared should meet the requirements of an Initial Environmental Examination (IEE) under AID procedures. These appraisals will be useful to USAID in making choices regarding further assistance, for example, in upgrading firms' techologies or equipment. If USAID chooses to provide assistance in implementing recommendations originating with the environmental management appraisals, the management appraisals will be used as IEEs to determine whether further impact analysis is required under AID regulations.

TRAINING: A second focus of the project is to provide training to personnel from the private sector, government agencies, NGOs and PVOs in the conduct of environmental management appraisals, risk assessment, environmental impact assessment, and environmental planning. These activities are categorically excluded from environmental impact assessment procedures under Section 216.2(c)(2)(i).

POLICY STUDIES: Environmental management appraisals are expected to identify regulations and policies that may impede effective reclamation, recovery and recycling of industrial by-products and residues. A third project focus is to conduct policy investigations of these constraints. As the findings and recommendations of these studies may have significant and complex implications for the biological, physical, social and economic environments, these policy studies should include a programmatic environmental impact assessment of these implications. These programmatic environmental assessments should be adequate to meet the requirements of an IEE under AID procedures.

B. Recommended Environmental Action

According to AID's Environmental Procedures, 22 CFR Section 216, the function of the IEE is to provide a brief statement of the basis for a threshhold decision, which determines whether a proposed Agency action is a major action significantly affecting the environment. With respect to effects on the environment outside the United States, Section 216.1(c)(11) defines "significant effect on the environment" as "significant harm to the environment." As the purpose of the proposed project is to improve the urban and industrial environment, a negative determination under Section 216.3(a)(3)(iii) is recommended. In this recommendation for a negative determination, it is understood that should USAID choose to provide assistance in the implementation of recommendations originating with project-funded environmental management appraisals, the management appraisals will be used as IEEs to determine whether further impact analysis is required under AID regulations.

ANNEX F

STATUTORY CHECKLIST

5C(2) - ASSISTANCE CHECKLIST

Listed below are statutory criteria applicable to the assistance resources themselves, rather than to the eligibility of a country to receive assistance. This section is divided into three parts. Part A includes criteria applicable to both Development Assistance and Economic Support Fund resources. Part B includes criteria applicable only to Development Assistance resources. Part C includes criteria applicable only to Economic Support Funds.

CROSS REFERENCE: IS COUNTRY CHECKLIST UP TO DATE?

Yes. It is included in the PAAD for the Private Enterprise Policy Support Program (492-0457).

A. CRITERIA APPLICABLE TO BOTH DEVELOPMENT ASSISTANCE AND ECONOMIC SUPPORT FUNDS

1. **Host Country Development Efforts** (FAA Sec. 601(a)): Information and conclusions on whether assistance will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions.

1. and 2. The purpose of the project is to improve the industrial management of pollution. This will be accomplished in part through assisting private firms to upgrade their production methods and equipment. It is expected that there will be increased U.S. technical assistance and business opportunities as a result of the project.

2. **U.S. Private Trade and Investment** (FAA Sec. 601(b)): Information and conclusions on how assistance will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

3. **Congressional Notification**

a. General requirement (FY 1991 Appropriations Act Secs. 523 and 591; FAA Sec. 634A): If money is to be obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified

The waiting period for this Congressional Notification expired without objection on August 19, 1991.

to Congress, has Congress been properly notified (unless the notification requirement has been waived because of substantial risk to human health or welfare)?

b. **Notice of new account obligation** (FY 1991 Appropriations Act Sec. 514): If funds are being obligated under an appropriation account to which they were not appropriated, has the President consulted with and provided a written justification to the House and Senate Appropriations Committees and has such obligation been subject to regular notification procedures? N/A

c. **Cash transfers and nonproject sector assistance** (FY 1991 Appropriations Act Sec. 575(b)(3)): If funds are to be made available in the form of cash transfer or nonproject sector assistance, has the Congressional notice included a detailed description of how the funds will be used, with a discussion of U.S. interests to be served and a description of any economic policy reforms to be promoted? N/A

4. **Engineering and Financial Plans** (FAA Sec. 611(a)): Prior to an obligation in excess of $500,000, will there be: (a) engineering, financial or other plans necessary to carry out the assistance; and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? Yes.

5. **Legislative Action** (FAA Sec. 611(a)(2)): If legislative action is required within recipient country with respect to an obligation in excess of $500,000, what is the basis for a reasonable expectation that such action will be completed in time to permit orderly accomplishment of the purpose of assistance. N/A

6. **Water Resources** (FAA Sec. 611 (b); FY 1991 Appropriations Act Sec. 501): If project is for water or water-related land resource construction, have benefits and costs been computed to the N/A

the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for guidelines.)

7. **Cash Transfer and Sector Assistance** (FY 1991 Appropriations Act Sec. 575(b)): Will cash transfer or nonproject sector assistance be maintained in a separate account and not commingled with other funds (unless such requirements are waived by Congressional notice for nonproject sector assistance)? — N/A

8. **Capital Assistance** (FAA Sec. 611(e)): If project is capital assistance (e.g., construction), and total U.S. assistance for it will exceed $1 million, the Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively? — N/A

9. **Multiple Country Objectives** (FAA Sec. 601(a)): Information and conclusions on whether projects will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. — See A.1

10. **U.S. Private Trade** (FAA Sec. 601(b)): Information and conclusions how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). — See A.1

11. **Local Currencies**

a. **Recipient Contributions** (FAA Secs. 612(b), 636(h)): Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

The Project Grant Agreement contains a covenant that the grantee will maintain adequate resources for project implementation. Grantee contributions will include logistical and administrative costs to support contractors, salaries of government participants during training, related travel costs during training, office space, training venues, and other support costs.

b. **U.S. -Owned Currency** (FAA Sec. 612(d)): Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

No.

c. **Separate Account** (FY 1991 Appropriations Act Sec. 575). If assistance is furnished to a foreign government under arrangements which result in the generation of local currencies:

N/A

(1) Has A.I.D. (a) required that local currencies be deposited in a separate account established by the recipient government, (b) entered into an agreement with that government providing the amount of local currencies to be generated and the terms and conditions under which the currencies so deposited may be utilized, and (c) established by agreement the responsibilities of A.I.D. and that government to monitor and account for deposits into and disbursements from the separate account?

(2) Will such local currencies, or an equivalent amount of local currencies, be used only to carry out the purposes of the DA or ESF

chapter is the source of the assistance) or for the administrative requirements of the United States Government?

(3) Has A.I.D. taken all appropriate steps to ensure that the equivalent of local currencies disbursed from the separate account are used for the agreed purposes?

(4) If assistance is terminated to a country, will any unencumbered balances of funds remaining in a separate account be disposed of for purposes agreed to by the recipient government and the United States Government?

12. **Trade Restrictions**

a. Surplus Commodities (FY 1991 Appropriations Act Sec. 521(a)): If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? N/A

b. Textiles (Lautenberg Amendment) (FY 1991 Appropriations Act Sec. 521(c)): Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule (Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel? No.

13. **Tropical Forests** (FY 1991 Appropriations Act Sec. 533(c) (3)): Will funds be used for any program, project or activity which would (a) result in any significant loss of tropical forests, or (b) involve industrial timber extraction in primary tropical forest areas?	No.
14. **Sahel Accounting** (FAA Sec 121(d)): If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (either dollars or local currency generated therefrom)?	N/A
15. **PVO Assistance**	N/A
a. Auditing and registration (FY 1991 Appropriations Act Sec. 537): If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.?	
b. Funding sources (FY 1991 Appropriations Act, Title II, under heading "Private and Voluntary Organizations"): If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government?	N/A
16. **Project Agreement Documentation** (State Authorization Sec. 139 (as interpreted by conference report)): Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the Untied States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision).	This information will be cabled within the required time period.

17. **Metric System** (Omnibus Trade and Competitiveness Act of 1988 Sec. 5164, as interpreted by conference report, amending Metric Conversion Act of 1975 Sec. 2, and as implemented through A.I.D. policy: Does the assistance activity use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to Untied States firms? Are bulk purchases usually to be made in metric, and are components, subassemblies, and semi-fabricated mater ials to be specified in metric units when economically available and technically adequate? Will A.I.D. specifications use metric units of measure from the earliest programmatic stages, and from the earliest documentation of the assistance processes (for example, project papers) involving quantifiable measurements (length, area, volume, capacity, mass and weight), through the implementation stage?	Yes.
18. **Women in Development** (FY 1991 Appropriations Act, Title II, under heading "Women in Development"): Will assistance be designed so that the percentage of women participants will be demonstrably increased?	Yes. There is expected to be a significant number of women participants, particularly in the project's training activities. The Project will collect participant/beneficiary data on a gender-diseggregated basis.
19. **Regional and Multilateral Assistance** (FAA Sec. 209): Is assistance more efficiently and effectively provided through regional or multilateral organizations? If so, why is assistance not so provided? Information and conclusions on whether assistance will encourage developing countries to cooperate in regional development programs.	No.

20. **Abortions** (FY 1991 Appropriations Act, Title II, under heading "Population, DA," and Sec. 525): N/A

a. Will assistance be made available to any organization or program which, as determined by the President, supports or participates in the management of a program of coercive abortion or involuntary sterilization?

b. Will any funds be used to lobby for abortion?

21. **Cooperatives** (FAA Sec. 111): Will assistance help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life? No.

22. **U.S.-Owned Foreign Currencies** N/A

a. **Use of currencies** (FAA Secs. 612(b), 636(h); FY 1991 Appropriations Act Secs. 507, 509):: Describe steps taken to assure that, to the maximum extent possible, foreign currencies owned by the U.S. are utilized in lieu of dollars to meet the cost of contractual and other services.

b. **Release of currencies** (FAA Sec. 612(d)): Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

23. **Procurement**

a. **Small business** (FAA Sec. 602(a)): Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? Yes.

b. **U.S. procurement** (FAA Sec. 604(a)): Will all procurement be from the U.S. except as otherwise determined by the President or determined under delegation from him? Yes.

c. **Marine insurance** (FAA Sec. 604(d)): If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company?	No.
d. **Non-U.S. agricultural procurement** (FAA Sec. 604(e)): If non-U.S. procurement of agricultural commodity or product thereof is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.)	N/A
e. **Construction or engineering services** (FAA Sec. 604(g)): Will construction or engineering services be procured from firms of advanced developing countries which are otherwise eligible under Code 941 and which have attained a competitive capability in international markets in one of these areas? (Exception for those countries which receive direct economic assistance under the FAA and permit United States firms to compete for construction or engineering services financed from assistance programs of these countries.)	N/A
f. **Cargo preference shipping** (FAA Sec. 603): Is the shipping excluded from compliance with the requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percent of the gross tonnage of commodities (computed separately from dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates?	No.
g. **Technical assistance** (FAA Sec. 621 (a)): If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent	Yes.

practicable? Will the facilities and resources of other Federal agencies be utilized, when they are particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

h. **U.S. air carriers** (International Air Transportation Fair Competitive Practices Act, 1974): If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available?

Yes.

i. **Termination for convenience of U.S. Government** (FY 1991 Appropriations Act Sec. 504): If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States?

All contracts will contain such provision.

j. **Consulting services** (FY 1991 Appropriations Act Sec. 524): If assistance is for consulting service through procurement contract pursuant to 5 U.S.C. 3109, are contract expenditures a matter of public record and available for public inspection (unless otherwise provided by law or Executive Order)?

Yes.

k. **Metric conversion** (Omnibus Trade and Competitiveness Act of 1988, as interpreted by conference report, amending Metric Conversion Act of 1975 Sec. 2, and as implemented through A.I.D. policy): Does the assistance program use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms? Are bulk purchases usually to be made in metric, and are components, subassemblies, and semi-fabricated materials to be specified in metric units when economically available and technically adequate? Will

Yes.

A.I.D.specifications use metric units of measures from the earliest programmatic stages, and from the earliest documentation of the assistance processes (for example, project papers) involving quantifiable measurements (length, area, volume, capacity, mass and weight), through the implementation stage?

1. **Competitive Selection Procedures** (FAA Sec. 601(e)): Will the assistance utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? — Yes.

24. **Construction** — N/A

a. Capital project (FAA Sec. 601(d)): If capital (e.g., construction) project, will U.S. engineering and professional services be used?

b. Construction contract (FAA Sec. 611(c)): If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

c. Large projects, Congressional approval (FAA Sec. 620(k)): If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprise in Egypt that were described in the Congressional Presentation), or does assistance have the express approval of Congress?

25. **U.S. Audit Rights** (FAA Sec. 301(d)): If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? — N/A

26. **Communist Assistance** (FAA Sec. 620(h): Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid — Yes.

projects or activities of the Communist-bloc-countries?

27. **Narcotics**

a. **Cash reimbursements** (FAA Sec. 483): Will arrangements preclude use of financing to make reimbursements, in the form of cash payments, to persons whose illicit drug crops are eradicated? Yes.

b. **Assistance to narcotics traffickers** (FAA Sec. 487): Will arrangements take "all reasonable steps" to preclude use of financing to or through individuals or entities which we know or have reason to believe have either: (1) been convicted of a violation of any law or regulation of the United States or a foreign country relating to narcotics (or other controlled substances); or (2) been an illicit trafficker in, or otherwise involved in the illicit trafficking of, any such controlled substance? Yes.

28. **Expropriation and Land Reform** (FAA Sec. 620(g): Will assistance prelude use of financing to compensate owners for expropriated or nationalized property, except to compensate foreign nationals in accordance with a land reform program certified by the President? Yes.

29. **Police and Prisons** (FAA Sec. 660): Will assistance preclude use of financing to provide training, advice, or any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? Yes.

30. **CIA Activities** (FAA Sec. 662): Will assistance preclude use of financing for CIA activities? Yes.

31. **Motor Vehicles** (FAA Sec. 636(i): Will assistance preclude use of financing for purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicle manufactured outside U.S., unless a waiver is obtained? Yes.

32. **Military Personnel** (FY 1991 Appropriations Act Sec. 503): Will assistance preclude use of financing to pay pensions, annuities, retirement pay, or adjusted service compensation for prior or current military personnel?	Yes.
33. **Payment of U.N. Assessments** (FY 1991 Appropriations Act Sec. 505): Will assistance preclude use of financing to pay U.N. assessments, arrearages or dues?	Yes.
34. **Multilateral Organization Lending** (FY 1991 Appropriations Act Sec. 506): Will assistance prelude use of financing to carry out provisions of FAA section 209(d) (transfer of FAA funds to multilateral organizations for lending)?	Yes.
35. **Export of Nuclear Resources** (FY 1991 Appropriations Act Sec. 510): Will assistance preclude use of financing to finance the export of nuclear equipment, fuel, or technology?	Yes.
36. **Repression of Population** (FY 1991 Appropriations Act Sec. 511): Will assistance preclude use of financing for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?	Yes.
37. **Publicity or Propaganda** (FY 1991 Appropriations Act Sec. 516): Will assistance be used for publicity or propaganda purposes designed to support or defeat legislation pending before Congress, to influence in any way the outcome of a political election in the United States, or for any publicity or propaganda purposes not authorized by Congress?	No.
38. **Marine Insurance** (FY 1991 Appropriations Act Sec. 563): Will any A.I.D. contract and solicitation, and subcontract entered into under such contract, include a clause requiring that U.S. marine insurance companies have a fair opportunity to bid for marine insurance when such insurance is	Yes.

necessary or appropriate?

39. **Exchange for Prohibited Act** (FY 1991 Appropriations Act Sec. 569): Will any assistance be provided to any foreign government (including any instrumentality or agency thereof), foreign person, or United States person in exchange for that foreign government or person undertaking any action which is, if carried out by the United States Government, a United States official or employee, expressly prohibited by a provision of United States law? No.

ANNEX G

TECHNICAL ANALYSIS

ANNEX G: TECHNICAL ANALYSIS

A. Problem Statement and Project Goals

Industrial pollution in the Philippines is widespread. Industrial operations can be found in most regions and provinces, and a high percentage of industrial operations throughout the country are reported to be out of compliance with air, solid waste or water pollution control regulations. The causes of industrial pollution are numerous. In particular, outdated and inefficient process technology, lack of capital for installation of pollution control facilities or upgrading of existing facilities, a historical record of cronyism between industry and government officials, historically ineffective implementation of pertinent laws and regulations, and the absence of substantive penalties for non-compliance are widely recognized as contributing causes to industrial pollution problems.

As a result, environmental damage to natural resources is easily observed in many cases of industrial pollution. In a few cases, adverse effects on health or quality of life of workers or local residents can be attributed to the uncontrolled discharge of pollutants to the environment. As the health and livelihoods of local residents deteriorate as a result of industrial pollution, tensions arise between those who object to the pollution and those whose jobs depend on the continued operation of the offending industrial plant. Increasing information flow through broadcast and newspaper media fosters awareness of the need for environmental improvements and the short and long-term effects of continued improper waste discharge. Local citizens' groups have become active in seeking improvement of their environment and proper control of industrial waste discharges.

The ability of the Government of the Philippines (GOP) to enforce compliance with environmental regulations and standards is slowly emerging. A few industries in gross violation of air and water pollution standards have been shut down, including a temporary shutdown of one of the country's largest copper mining operations.

Enforcement of environmental pollution control regulations, particularly air and water quality standards, however, remains difficult. Agency resources for environmental management are severely limited. The budget of the Philippine government is severely restricted, and the majority of staff and financial resources of the Department of Environment and Natural Resources (DENR) are directed toward the urgent needs of reforestation and management of the remaining forest, mineral, and land resources. Measures that could be taken to enforce compliance with regulations are frustrated by the risk of a loss of jobs which, under the present economic environment in the country, are major social and economic considerations.

Finally, efforts to clean up environmental problems in one medium (i.e., water, air or land) too often result only in a transfer of the problem to another medium. For example, efforts to remove persistent toxic chemicals from the aquatic environment by installing a wastewater treatment facility may actually result in these same toxic chemicals appearing in sludges which are

improperly disposed of on land. Improper disposal of sludges subsequently may result in contamination of groundwater resources, which are used extensively for public water supply.

An important goal of the GOP is to prevent pollution from industrial sources, thereby improving the health of the people and the quality of the environment. Recognizing that the resources required to accomplish this goal are far greater than the resources currently available from the GOP or from this project, the purpose of the proposed project is to help the GOP make progress toward this ultimate goal by providing both industry and the GOP with the tools to begin reducing the amount and hazard of wastes generated by industry. At the same time, the proposed project moves toward the goal of encouraging sustained economic growth in the industrial sector, with corresponding improvements in health status.

B. Proposed Method of Addressing the Problem

The perceived conflict between jobs and the impact of the enforcement of pollution control measures on the profit margin encourages a large measure of resistance by industry to comply with environmental standards and regulations. To overcome this inertia, industry should perceive a tangible benefit in operational efficiency or the profit margin as a result of reduction in waste generation. If a benefit is perceived, movement of industry toward waste reduction and pollution prevention will be voluntary, thereby reducing pollution problems and easing the government regulatory burden.

A basic assumption of the project is that private firms will voluntarily participate in the project because of the financial benefits resulting from improvements in technology and production methods. Aside from the contribution of the project to improving environmental quality, an important consideration is the financial gains that can be realized through participation in project activities. There is a growing body of evidence, illustrated in the below examples, demonstrating that firms will voluntarily engage in pollution reduction and improved materials management practices.

-- The 3M Corporation has instituted a "Pollution Reduction Pays" program. Since the 1970s, improvements made under this program have resulted in savings of $537 million to 3M (in first year cumulative savings). In addition, air, hazardous and non-hazardous pollutants have been reduced by 577,000 tons, with wastewater reduction of 1.7 billion gallons.

-- American Enka Company, a nylon yarn production and research facility, purchased a used distillation unit to recycle its waste isopropyl alcohol solvent. The purchase of a used unit reduced the required capital investment and resulted in achieving 90 percent recovery of the isopropyl alcohol. Annual savings of $90,000 was generated due to reducing waste generation by 10,000 gallons per year.

-- An aluminum products manufacturer in New York State produced 500 gallons per week of spent sodium hydroxide solution. This

solution was used by a nearby chemical manufacturer for its wastewater pretreatment facility, which required the use of sodium hydroxide for pH control. The aluminum manufacturer now pays substantially less for waste transportation and nothing for waste disposal costs.

-- An electronics manufacturer in New York State produces 60 tons of wastewater treatment sludge per week from a metal treatment operation. The manufacturer is currently testing the possibility of using the sludge as an ingredient in cement kiln processing. All test results have been positive, and full utilization is expected to reduce all transportation and other waste disposal costs.

-- In its production of small electrical appliances, Emerson Electric Company in North Carolina substituted a water-based anodic electrostatic immersion paint system for its organic solvent-based paint system. As a result, waste solvent and paint sludge generation were reduced by over 95 percent. Consequently, annual raw material costs for paint have decreased and, due to these changes, waste management costs have been reduced.

-- Solvent substitution at the Reed Rolled Thread Die Company in Massachusetts resulted in savings of over $18,800 annually and improved worker health and environmental compliance.

-- Improvements in the rinsing and metals recovery processes and wastewater reduction process at the Hi-tech Gold Plating Corporation in Worcester, Massachusetts are removing 35 percent of the metals that previously went into the sewer system. Because of this, waster consumption dropped 75 percent, with a yearly savings of $2,600.

-- The Lampin Corporation of Massachusettes, a small manufacturer of high precision machine parts and components, discharged wastewater that contained CFCs. By replacing the CFCs with hot water in their cleansing process, Lampin was able to save approximately $6,000 per year.

-- In the Philippines, a steel company needed a neutralizing material for its wastewater treatment facility. Instead of using virgin material, which costs ₱1.500 per metric ton, the company used waste material from a chemical plant, at a cost of ₱330 per metric ton.

-- Also in the Philippines, a cannery plant generates excess pineapple pulp, which costs the company ₱1,524,600 in annual hauling costs to dispose of the material. With the establishment of a pulp-drying plant by another company, a market has been created for this pulp. By selling the waste pulp, the company has realized ₱2,896,740 per year in savings and additional income.

1. **Pollution Management Appraisals**

To accomplish this task, the project proposes to work cooperatively with industry in conducting Pollution Management Appraisals (PMAs). These are a type of environmental audit in which a small team of specialists works together with industry to:

-- Improve process efficiency.

-- Improve worker health and safety.

-- Reduce the amount of waste materials generated; and

-- Identify potential net positive financial returns in carrying out various recommendations of the PMAs.

The primary goal is source control, i.e., a reduction in the amount or toxicity of waste materials generated. This could be accomplished through improved process efficiency, substitution of toxic with non-toxic materials or non-recyclable materials with reusable materials, or modifications in manufacturing processes. A secondary goal is to identify potential markets for by-products and residues (by-product exchange programs) or potential on-site recycle/reclaim/reuse options. A tertiary goal is to recommend cost effective pollution control measures and technologies.

By selecting an approach that is cooperative and has a reasonable probability of producing a positive financial return, many industries are expected to voluntarily participate in PMAs. From an environmental standpoint, increased efficiency of operation and a reduction in the material disposed of as waste should generate benefits to the environment as a result of reduced pollutant discharge. Further, the approach has the advantage of considering the waste streams from a multi-media perspective.

In theory, this approach is significantly different from typical regulatory and enforcement programs. The approach focuses on industry taking initiatives that ultimately should improve environmental conditions as a result of improved internal or external (in the case of by-product exchange) efficiency and operations. In practice, these mutual benefits to both industry and the environment may not always accrue to the point where the industry is in full compliance with environmental regulations. Thus, regulations and enforcement remain important aspects of reducing pollution loading. However, the proposed approach is a valuable complement to regulations/enforcement in reaching this goal of full compliance.

The proposed project, therefore, will address both the incentive for industry (the "carrot" approach) and the strengthening of government capabilities in monitoring and enforcement (the "stick" approach). The PMAs are comparable to similar activities undertaken by many industries in industrialized countries. Industries in the United States, for example, have identified annual operation and maintenance cost savings in excess of $100,000 as a result of waste minimization and pollution reduction/prevention programs. One major American

manufacturing firm has instituted a "Pollution Prevention Pays" program, demonstrating the benefits of these voluntary actions to industry.

Strengthening the government's capabilities in pollution reduction and prevention is included through parallel and follow-up activities to PMAs. In addition, the proposed project's emphasis on working with industry complements activities of other donors which tend to focus on institutional strengthening of the GOP.

2. Parallel and Follow-On Activities

Several parallel and follow-on activities increase the effectiveness of the Pollution Management Appraisals in reducing or preventing industrial pollution. These are discussed in greater detail in Section D. In summary, major components of the project that provide these parallel and follow-up activities include:

a. Environmental Risk Assessment of Industrial Sectors

The Environmental Risk Assessment will be used to help establish priorities for Pollution Management Appraisals.

b. Policy Studies

It is anticipated that as PMAs are carried out, policy-related issues will arise that may inhibit voluntary industry cooperation or implementation of recommendations of the appraisals. These will be the subject of policy studies.

c. Public/Private Sector Dialogue

The GOP is actively engaged in a program to bring the public into active pollution reduction/prevention programs through PVOs and other citizen fora. Thus, public pressure is being marshalled to pressure polluting industrial plants into compliance with environmental regulations. The project will seek to enhance lines of communication between various parties affected by or interested in industrial pollution, thereby furthering the public/private sector dialogue.

d. Capability Building

Training opportunities will be provided for government, industry, and NGOs. Government trainees will include DENR staff from regional offices, EMB staff, DTI staff, and environmental officers in local government units. Trainees from the private sector will include pollution control officers for trade associations, business chambers, and industries, as well as Filipino consultants.

C. Alternative Methods Considered

Several alternatives approaches to the use of PMAs were considered to reduce pollution generated by industry. These alternatives included: changes in

regulatory programs, strict enforcement of regulations, improved monitoring of regulatory compliance, and alternative approaches to risk assessment and risk management.

1. Regulatory Changes

With the exception of management of hazardous and toxic wastes and protection of groundwater resources, existing regulatory programs in the Philippines are quite thorough and adequate. In particular, air and water quality standards are well developed. These standards are comparable to those of industrialized countries with extensive environmental regulatory programs. As development of regulations concerning toxic materials and hazardous wastes are now in progress, an approach focusing on regulatory programs was not warranted as the primary focus of the project.

Regulatory programs are important, however, and will not be ignored in the project. For example, policy studies conducted as part of this project may address some of the remaining gaps in regulatory programs regarding toxic materials, hazardous wastes, or groundwater protection.

2. Enforcement

Enforcement of regulations in the Philippines is difficult. Economic and political constraints make it difficult to invoke severe penalties on industries that are not in compliance. The GOP is making progress in improving enforcement programs, as demonstrated by recent incidents of shutdown of polluting industries due to non-compliance. Enforcement actions are resource-intensive with respect to staffing, technical skills and legal facilities. There is concern that expansion of enforcement capabilities would not be sustainable beyond the life of the project. Finally, enforcement accentuates an adversarial relationship between the government and industrial sector. Therefore, this approach was judged to be less effective and desirable than the proposed approach.

3. Monitoring

Although larger industrial operations should be required to carry out self-monitoring, thereby easing the burden on government, most medium and small-scale industries can not bear the expense. In some cases, industries could develop a type of consortium to share monitoring costs. This approach, however, would not likely have widespread application. Government, therefore, would need to continue to carry out monitoring activities as well as oversee the quality and credibility of self-monitoring carried out by large industries with this capability. Like enforcement, compliance monitoring is resource-intensive and conducive to an adversarial relationship between the government and industrial sector. Therefore, this approach was judged to be less effective and desirable than the proposed approach. The project will include some training and technical assistance in monitoring, however, because it is an important supporting tool for implementation of this project.

4. Risk Management Approaches

A risk assessment and risk management methodology has been developed and used in many industrialized nations to develop compliance and risk management programs for industrial facilities. Such an approach was considered and judged potentially useful to assess/manage risks and undertake waste management initiatives for a particular plant or a geographic region -- e.g., in Ormoc, Leyte. However, the approach is not as effective in meeting project goals and objectives of serving as a screening tool for identifying priority industrial sectors or plants for participation in the PMA activities. This approach was considered useful as one possible follow-on activity to be carried out as a waste management initiative.

D. Parallel and Follow-On Activities

As indicated in Section B.2, several parallel and follow-on activities are proposed to increase the effectiveness of PMAs in reducing or preventing industrial pollution. These are described here in greater detail.

1. Environmental Risk Assessment

When decisions are made to address pollution problems and budgets are limited, the public and the environment are best served when those limited funds are used to address issues that have the highest risk of adverse effects on public health, natural resources and livelihoods. A risk assessment methodology has been developed and applied in the United States and other industrialized countries. Historically applied primarily to hazardous technologies and chemical pollutants, the technique recently has been modified and expanded to address a broader range of ecological and environmental problems. These modifications, rather than shaping a program for compliance and risk management, have a specific objective of helping government agencies identify priorities for focusing regulatory, monitoring, and enforcement activities.

Preparation of an Environmental Risk Assessment (ERA) will be an important parallel activity in the proposed project. The ERA will be used to identify Philippine industries that pose the highest risk of environmental damage. The ERA is an important part of the proposed project in that it sets the priorities for subsequent PMAs.

Factors considered in Environmental Risk Assessment include:

- Public use of natural resources and public perceptions of pollution problems affecting these resources.
- Existence of sensitive and critical habitats and resources in an area affected by industrial pollution.
- Fate of pollutants in the environment.
- Toxic hazard of the pollutant and effects on natural resources; and

-- Degree of exposure, in large part determined by socio-economic status (i.e., urban poor have restricted mobility in relation to wealthier neighbors).

Once targets of concern are identified in the environment (the first two factors listed above), the fate and hazard of the pollutants are evaluated, and the exposure of these targets is factored in to develop the relative degree of risk. Thus, a pollutant could be hazardous, but if the exposure is very low, then the risk is also low. A pollutant that is not as hazardous but involves a high degree of exposure may represent a much larger risk to sustainable use of natural resources or to human health.

2. Implementation Support

Project-assisted technology transfer will depend on the outcomes of the PMAs. Assistance with implementation of PMA recommendations will focus on overcoming impediments to adoption and implementation of recommendations arising from the PMAs. This technology transfer may include assistance with source control; by-product exchange or recycle/reclaim/reuse programs; feasibility studies, e.g. for hazardous waste management facilities; appropriate technology for pollution abatement and prevention; and risk management assessments. This component of the project may be especially critical for medium and small-scale industries who need assistance in carrying out recommendations of the PMAs.

3. Policy Support and Public/Private Sector Dialogue

As the PMAs and other components of this project move forward, it is anticipated that policy-related factors influencing effective pollution reduction will be identified. These factors and their effects on voluntary industry action will be the subjects of policy studies. The purpose of these policy studies will be to analyze the impacts of various policy options for encouraging pollution reduction and to provide practical recommendations for government consideration.

While the need for such policy studies will be keyed to the findings of the PMAs, certain policy issues are already evident. These issues involve the gaps in current environmental regulations, integration of regulation/ enforcement and voluntary activities, incentives and impediments to voluntary industry efforts, distribution of authority and fiscal resources among government units, and integration of pollution prevention and risk assessment into Environmental Impact Statements. More details on these studies are provided in the background documents for this Project Paper.

The public/private dialogue activities will enhance communication lines between all parties affected by or interested in industrial pollution. More details on these activities are also provided in the background documents for this Project Paper.

4. Capability Building

Training activities in this project will focus on industry, trade associations, other NGOs, and government personnel. Private sector trainees

will include pollution control officers and representatives from industry, trade associations, local environmental consulting firms, and private consultants such as university professors. Public sector trainees will include environmental officers from local government units, regional DENR staff, EMB staff, and DTI staff.

a. Private Sector

The primary purpose of private sector training is to train pollution control officers for industry and trade associations. The training programs will focus on the conduct of Pollution Management Appraisals, environmental impact assessments, compliance audits, and pollution control technology. Training will include a combination of workshops, seminars and hands-on training in PMAs.

Medium and small-scale industries may not be able to support firm-based pollution control officer positions. Therefore, the project proposes to train and support pollution control officers who will be associated with trade organizations that specifically serve medium and small-scale industries. Thus, medium and small-scale industries can avail themselves of technical assistance through their respective trade associations.

Technical skills necessary to carry out PMAs will vary by the size and complexity of the individual operations under appraisal. However, it is anticipated that individuals with backgrounds in environmental engineering, chemical or process engineering, occupational health and safety, toxicology and ecology (air or water quality specialists) will require the least amount of training. The more complex the facility or process, the greater the demand for environmental, chemical or process engineering expertise. Depending on the industry and issues, PMAs generally will require a team of two to four persons with complementary skills in these major disciplines.

b. Public Sector

The primary purpose of public sector training is to strengthen the capabilities of EMB, DTI, and regional DENR staff in conducting Environmental Risk Assessment, compliance inspections (including monitoring), and data management. Environmental officers from local government units also will be provided training in environmental impact assessment and related environmental management tools. Further, some public sector staff also will participate in training on conducting PMAs so that a common understanding of their goals and techniques will encourage the public/private dialogue. Training will include a combination of workshops, seminars, and on-the-job training.

5. Internal Project Assessment

An important assumption of the project design is that industrial plants will implement many of the recommendations made in the PMAs. The project design includes an internal review mechanism at two levels. The training component includes a post-appraisal assessment of the PMA training program. On a periodic basis (approximately annually), an assessment team will be specifically charged with responsibility for contacting industrial plants that

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participated in a PMA to determine whether recommendations were carried out, what benefits may have accrued to industry and the environment from implementing the appraisal recommendations, and to identify factors that have prevented companies from carrying out the recommendations. If factors that prevent implementation originate in policy-related issues, these can be subjected to policy studies or public/private sector dialogue.

E. Implementation Issues

1. Feasibility

The project proposes to use state-of-the-art techniques customized to fit existing conditions in the Philippines to address industrial pollution issues. The techniques, however, potentially benefit industry as well as society. Thus, use of these techniques is expected to be appealing to industry. This is expected to be a key factor in successful implementation of the project. Potential benefits that industry may experience include: improvements in process efficiency; improvements in worker health and safety; reduction in the amount of waste generated; and ideas for substituting one feedstock material with another that has lower hazard or higher reclaim value. In some cases, benefits to financial condition may accrue to the facility. The proposed project envisages using trade associations as a mechanism for reaching medium- and small-scale industries.

As indicated in Section B, the basic rationale for the approach is centered on positive rewards and self-improvement in Philippine industries. Within the political, cultural, and social context, this is a suitable approach. Further, where feasible, market forces are employed to encourage movement toward waste minimization, by-product exchange programs, and waste management initiatives. As indicated in Section C, alternative approaches are less suitable and are likely to be less cost-effective.

Identification of priority and high-risk industries is feasible. The EMB has already prepared for each region a list of twelve industrial facilities that are believed to generate the largest amount of pollution. This list will be used in approaching industries and industrial sectors with offers to participate in PMAs. A major component of the technical assistance offered by the project is to work with EMB in conducting an Environmental Risk Assessment in various industrial sectors. The output from the Environmental Risk Assessment will identify priority and high-risk industries and facilities.

2. Project Implementation

The project implementation contractor(s) is expected to include a long-term chief of party responsible for integration and coordination of all project activities. Technical assistance, training, policy studies and facilitation of public/private sector dialogue will occur through a mixture of short-term US consultants and locally-hired consultants.

The project initially will work with a small number of industries in which PMAs are expected to generate substantial economic benefits to the industry along with significant reductions in waste volume. Seminars will be held to

explain the process and potential benefits to interested industries and trade associations.

Agro-industries in particular offer such opportunities for the first round of PMAs, with the added benefit that it is an industrial sector with which USAID has considerable experience. The semiconductor industry offers an opportunity to address industrial facilities that include complex technologies and hazardous materials. Although these tend to be multinational companies with the resources necessary to conduct these appraisals themselves, they have expressed the desire for assistance with waste management issues and would be a useful training venue for appraisal teams in the first round of PMAs.

The PMAs in agro-industry and the semiconductor industry will serve as a training ground for a core group of local counterparts who later will serve as trainers in the appraisal process. Reports of the achievements from the first phase will be prepared for distribution to other industries.

Concurrently, work will begin early in the project to compile existing information for the Environmental Risk Assessment and for training government counterparts in this methodology. The Environmental Risk Assessment will be carried out to determine priority industrial firms for potential participation in the project. The Environmental Risk Assessment is a special analytical tool that will be modified to fit the Philippine situation. This tool evaluates the greatest risks to ecosystems, human health, and economic livelihoods due to pollutant hazard and exposure.

Later in the project, when the Environmental Risk Assessment has been completed, PMAs will be conducted on high risk industrial operations or other industries that request to participate in the project. Examples of such industries are chemical plants, cement plants, sugar mills, mining operations, or petroleum refineries.

The project team will give preference to conducting PMAs with firms that are located in areas of industrial concentration -- or clusters -- for two reasons. First, given the competitive nature of small and medium Philippine firms, competing firms will be quick to adopt new technologies or processes recommended by PMAs if they can perceive a financial benefit accruing from them. The spread effect of project efforts will be greater in zones of industrial concentration. Second, the PMA team might be able to recommend more capital-intensive pollution abatement improvements if costs can be shared by a large number of similar firms. Thus, economies of scale will increase investment options in industrial clusters.

Based on the outcome of these appraisals, waste management initiatives may be implemented. These initiatives could include feasibility studies for hazardous waste management facilities, waste exchange programs, loans for pollution control equipment, or other forms of technical assistance and technology transfer.

An illustrative schedule of the implementation plan for the project is shown in Figure G-1. The parallel and follow-on components are generally driven by the technical component of the project.

3. Skills Requirement

Effective implementation of this project requires at least one individual on the contractor's implementation team with considerable experience working directly for or with industry on environmental audits. Experience in environmental audits should include a combination of compliance audits, waste minimization programs, by-product exchange programs, or resource substitution. Although this skill could be part of USAID's project oversight team, there is a danger that other office duties and the frequency of assignment rotations would dilute this individual's ability to focus on the project. Therefore, it would be preferable to have this expertise on the implementation team.

Overall, the implementation team should consist of a multidisciplinary core group of specialists in environmental engineering, chemical or process engineering, public or occupational health and safety, toxicology, ecology (including air or water quality specialists), and similar disciplines. Market analysts with familiarity of Philippine market conditions and experience with by-product exchange programs are also desirable. Because of the variety of industries in the Philippines, skills requirements will likely be required on a short-term, rapid mobilization basis. The team will also require staff with skills in policy analysis and training, and possibly public health and social analysis.

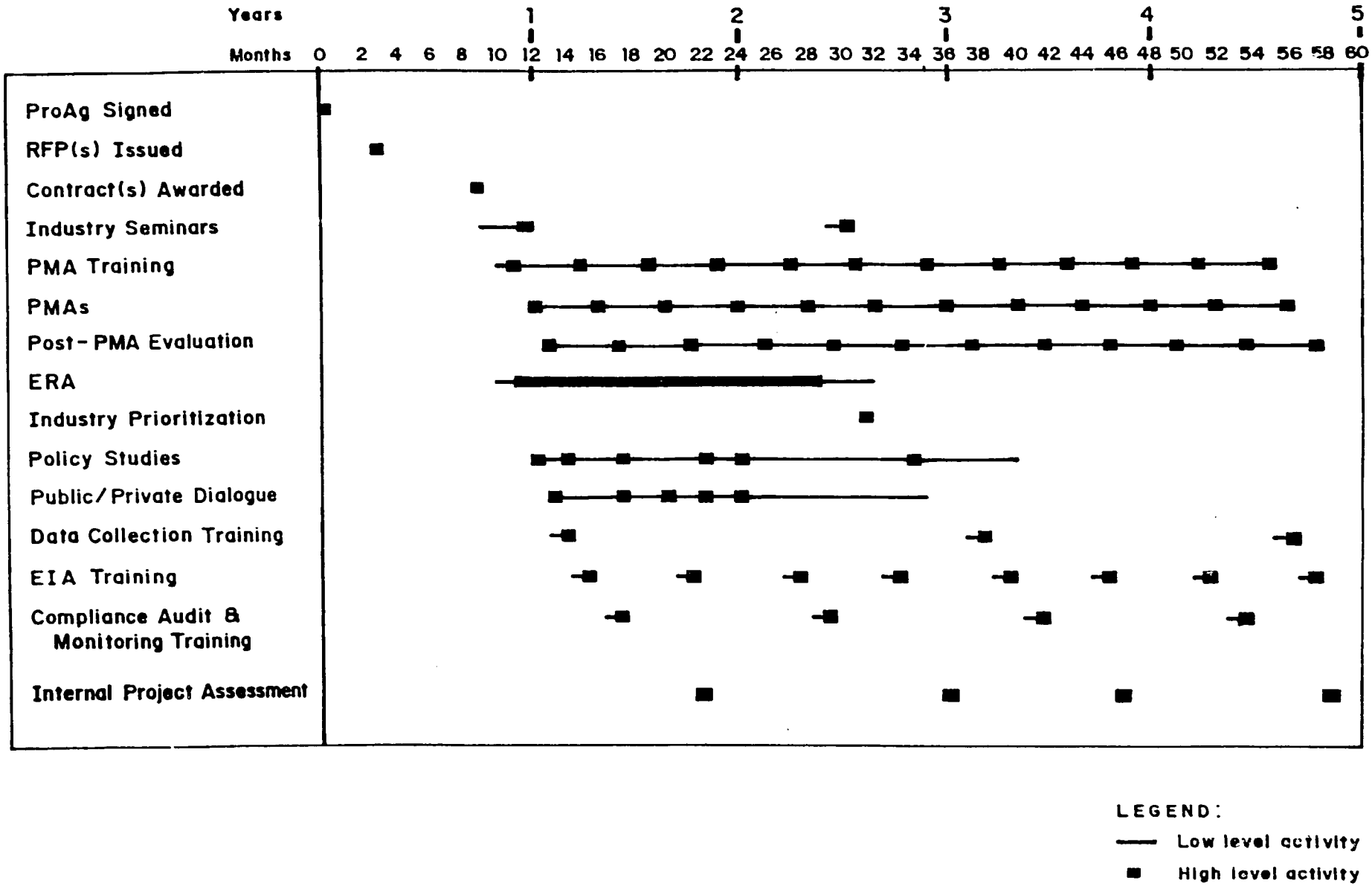

Figure G-1. Illustrative Implementation Schedule

ANNEX H

FINANCIAL ANALYSIS

ANNEX H: FINANCIAL ANALYSIS

I. FINANCIAL ANALYSIS

As a non-revenue earning project aimed at and designed for improving socio-economic infrastructure of the country, health status of the citizenry and quality of the environment, a cost-benefit analysis may not be applicable as only the costs are readily identified and quantified, while the benefits come in the form of "intangibles" such as:

a. Probability of producing positive financial return.
b. Increased efficiency of operation and reduction in waste disposal; and
c. Sustained economic growth in the industrial sector, with corresponding improvements in health status.

The financial valuation of the project's potential advantages therefore is difficult to quantify since the benefits are not linked directly to measurable financial revenues. A case study, however, was made for a piggery in General Santos City, which is presented in Part II of this annex. Also, measurable economic benefits have been discussed in the Economic Analysis section of the Project Paper.

The following discussion focuses on the funds availability and cost-effectiveness aspects of the project.

1. Funds Assurance

Among the critical factors for a project to achieve its stated objectives is an assurance that funds are made available to cover costs in a timely manner.

AID's project cost commitment of $20 million over the 5-year project life shall be incrementally funded as follows ($000):

Yr 1	Yr 2	Total
$5,000	$15,000	$20,000

This projected funding schedule will enable AID to budget for the funds and precipitate financial commitment or payment obligations at the appropriate time. The projected expenditures are presented in Table 4.

2. Cost-Effectiveness Analysis

Costs for the project include expenses for transportation (foreign and local air/ground travel and other travel-related expenses), per diems, consultancy fees, hardware and related administrative costs. Expenditures therefore shall be justified in terms of:

a. Maximizing effectiveness for a given level of cost; and
b. Finding the best trade-off between costs and effectiveness.

The following presentation shows the relative percentages of each project component to the total project cost, the expected outputs and unit cost.

Project Element	Amount ($000)	% to Total	Output	Unit Cost
1. Technical Asst. a. Pollution Reduction Initiative	$11,000	54	150 PMAS; 60 firms implementing recommendations; high risk industry sectors id'd.	$49,000 per PMA or $925,000 per task
b. Project Management Staff	$2,000	10	Administrative support to project; acquisition/ utilization of computer hardware and equipment.	$ 201,300 per staff
2. Policy Studies, Pub/Priv Dialogue	$2,700	14	Ten policy studies completed; five public/private dialogues; one credit facility study undertaken. Expanded role of NGOs and public in GOP and industry envir. management programs.	$148,345 per study; $163,310 per dialogue; $200,000 for credit fac. study.
3. Capability Building	$3,800	19	2,000 persons trained on various aspects of envir. mgmt. systems; 75 workshops conducted.	$1,900 per trainee or $50,000 per workshop
4. Evaluation and Audit	$500	3	Extent of fin./ tech. management capability of agency/private sector.	$100,000 per tech review; $50,000 per financial review
Total	$20,000	100%		

Table H-1
INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROJECT
(492-0465)

Illustrative Financial Plan
(US $000)

PROJECT ELEMENTS	Current Obligation	AID GRANT Future Years Anticipated	TOTAL Life of Project Costs
1. Pollution Reduction Initiative	3,240	9,760	13,000
2. Policy Studies and PP Dialogue	820	1,980	2,800
3. Capability Building	940	2,760	3,700
4. Evaluation and Audit	0	500	500
TOTAL	5,000	15,000	20,000

Note:

1. Future years AID obligations are subject to the availability of funds and mutual agreement of the parties to proceed.
2. These figures were lifted from Table H-4.

Table H-2
INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROJECT
(492-0465)

Summary Cost Estimates and Financial Plan
(US $000)

PROJECT ELEMENTS	L C	F X	TOTAL USAID
1. Pollution Reduction Initiatives	4,600	8,400	13,000
2. Policy Studies and P/P Dialogues	1,100	1,700	2,800
3. Capability Building	500	3,200	3,700
4. Evaluation and Audit	500	0	500
TOTAL	6,700	13,300	20,000

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Table H-3
INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROJECT
(492-0465)

Planned Yearly Obligations & Expenditures
(US $000)

	1991	1992	1993	1994	1995	1996	TOTAL
LOP Funding							20,000
Planned Obligations	5,000	15,000	0	0	0	0	20,000
Planned Expenditures (from Table 4)	0	1,600	6,300	5,300	3,800	3,000	20,000
Projected Mortgage (LOP - Cum Obligations)	15,000	0	0	0	0	0	
Mortgage/LOP	75%	0	0	0	0	0	
Projected Pipeline (Cum Obl - Cum Exp)	5,000	18,400	12,100	6,800	3,000	0	
Pipeline/Obligations	100%	92%	61%	34%	15%	0%	

Table II-4

INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROJECT

(492-0465)

Projected Expenditures by Fiscal Year & By Project Element

(US $000)

PROJECT ELEMENTS	FY 1992			FY 1993			FY 1994			FY 1995			FY 1996			GRAND TOTAL		
	LC	FX	SUB-TOTAL	LC	FX	SUB-TOTAL	LC	FX	SUB-TOTAL	LC	FX	SUB-TOTAL	LC	FX	SUB-TOTAL	LC	FX	USAID
1. Pollution Reduction Initiative	311	644	955	1,251	2,500	3,750	1,059	1,923	2,981	805	1,209	2,014	378	662	1,040	3,803	6,937	10,740
Inflation	16	32	48	128	256	384	167	303	470	173	261	434	100	173	273	584	1,025	1,609
Contingency	16	34	50	69	138	207	61	111	173	49	73	122	24	42	66	219	398	617
Sub-Total	343	710	1,053	1,448	2,893	4,341	1,287	2,337	3,623	1,027	1,543	2,570	502	877	1,379	4,606	8,360	12,966
2. Policy Studies and P/P Dialogues	156	132	288	404	474	878	306	400	706	64	205	270	59	189	249	989	1,401	2,390
Inflation	8	7	14	41	49	90	32	44	76	11	36	47	10	36	46	102	171	273
Contingency	8	7	15	22	26	48	17	22	39	4	12	16	3	11	15	55	79	133
Sub-Total	172	146	317	468	549	1,017	355	466	821	79	253	332	73	237	310	1,146	1,651	2,797
3. Capability Building	79	143	222	244	579	823	37	587	624	55	652	707	24	717	741	439	2,678	3,117
Inflation	4	7	11	13	36	49	14	67	81	36	115	151	2	145	147	69	370	439
Contingency	4	8	12	13	31	44	2	33	35	4	39	43	2	44	46	25	155	180
Sub-Total	87	158	245	270	646	916	53	687	740	95	806	901	28	906	934	533	3,203	3,736
4. Evaluation & Audit	0	0	0	43	0	43	128	0	128	43	0	43	286	0	286	500	0	500
Inflation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	0	0	0	43	0	43	128	0	128	43	0	43	286	0	286	500	0	500
Total USAID Project Elements	546	919	1,465	1,941	3,553	5,494	1,529	2,909	4,439	967	2,066	3,034	747	1,568	2,316	5,731	11,016	16,747
Total Inflation	27	45	73	183	341	523	213	414	627	220	412	632	112	354	466	755	1,566	2,321
Contingency	28	49	77	104	195	299	80	166	247	57	125	181	30	97	127	299	632	931
Total USAID	601	1,013	1,615	2,228	4,089	6,317	1,822	3,490	5,312	1,244	2,602	3,847	889	2,019	2,908	6,786	13,214	19,999

Assumptions:

1. Feasibility studies/dialogue costed at $45,000 distributed as follows:
   1992 - 6; 1993 - 25; 1994 - 19; 1995 - 10 or a total of 60
2. Credit facility study costed at $200,000

II. CASE STUDY: POLLUTION REDUCTION AT A PIGGERY

A. Background

Among the principal assumptions that have been employed in the design of IEMP are those surrounding the financial viability and attractiveness of in-plant process modifications identified during the Pollution Management Appraisal (PMA). Indeed, this assumption lies at the core of the design approach in that it defines the basis for voluntary cooperation by industry, namely, that there are opportunities present at many facilities for pollution to be reduced by undertaking activities that will improve the financial performance of the firm. As discussed in Annex G, which presents the technical rationale for IEMP, there are numerous examples that validate the validity of this assumption, albeit not from the Philippines.

Another assumption/concern is that, to some extent, constraints within the credit market will influence the choice of firms relative to investments made in pollution control. Of particular concern is the high rate of market interest in the Philippines (currently estimated at 24 percent but acknowledged to have been as high as 48-50 percent within the last year) and whether this level of interest would preclude investments in improvements.

To provide further assistance to the design of IEMP, this assumption was tested in a limited fashion. To this end, a piggery in General Santos City (Mindanao) was visited to determine the nature of their operations and to identify whether financially viable, attractive opportunities were present to reduce the levels of pollution from those facilities. Another piggery employing pollution control measures was visited to serve as a model for potential improvements.

There are 6,000 hogs at the piggery in General Santos City. Waste water from the operations is discharged untreated into a nearby river. Based upon financial data supplied by the owner, the operation yields an internal rate of return of 13 7 percent.

B. Potential Improvements and Cost Recovery

Although time limitations did not permit the conduct of a rigorous PMA, two potential improvements to current operations were identified at the General Santos City piggery: (a) construction of a digester, treatment ponds, and gas storage facility; and (b) development of a duck yard and diversion of waste water through the yard. Both of these improvements are currently in use in the Philippines. Therefore, they do not represent new technologies but rather are more widespread applications of existing techniques. Both of the improvements were examined in light of different interest rates: domestic market interest rates of 24 percent and export (US) interest rates of 12 percent. This was done to determine the degree of influence of interest rates on the financial viability and attractiveness of the potential undertaking.

During the brief visit to the farm, the potential improvements were identified as follows:

1. Construction of a duck yard and diversion of the waste water through the duck yard. This activity could reduce the dry waste content of the waste water by 30 percent (estimated 600 kg per day of undigested corn). The IRR for the different lending conditions are indicated below:

Interest rate	IRR
24 %	28.23 %
12 %	34.76 %

This would provide cost recovery in 3 years 3 months.

2. Construction of a digester with three treatment ponds and a gas storage facility. This facility should virtually eliminate the pollutants from the waste water. The financial benefits to the farm from these improvements are the savings from the purchase of fuel. The IRR for different lending conditions are indicated below:

Interest rate	IRR
24 %	50.90 %
12 %	58.38 %

This would result in cost recovery in 3 years 4 months. The costs, revenues and savings from the construction of these two improvements were incorporated into the financial analyses of the farm.

C. Improvement of Overall Internal Rate of Return

The overall IRR for the piggery, assuming implementation of two proposed improvements for different interest rates are indicated below:

Interest rate	IRR
24 %	15.45 %
12 %	16.07 %

D. Improvement of the Accumulated Cash Flow

The accumulated cash flow after five years for the existing farm and the cash flow for each interest rate scenario, assuming implementation of both improvements, are indicated below:

Description	Cash (in P000)	Improvement
Present	20,205	-
Scenario (24%)	27,656	7,451
Scenario (12%)	29,991	9,786

E. Extended Benefits for Piggery Industry in General Santos

The financial benefits to the piggery were extrapolated to the piggery industry in the General Santos area. The number of pigs in General Santos wa estimated at 250,000 (40 farms with approximately 6,000 hogs per farm). Assuming that only 50 percent of farms improve their waste management systems as described above, the projected cash flow accumulation after a period of five years is estimated at:

Interest Rate	Accumulated Cash
Scenario (24 %)	310,46 million pesos
Scenario (12 %)	407,75 million pesos

F. Implications for IEMP Design

As shown above, implementation of the pollution reduction techniques (in this case, digester units and development of a duck yard) would improve the financial performance of the piggery and reduce its level of pollution. Thus, for the piggery, the basic assumptions regarding the attractiveness of pollution reduction on a voluntary basis appear to be valid for this component of the agro-industrial sector. Also, it appears that the reduction methods are financially viable and attractive even under high market interest rates.

The implications for IEMP design are the validation of the basic methodology and approach: there appear to be good and sufficient reasons to believe that voluntary reductions in some industrial sectors can be undertaken with a resulting increase in economic activity. What remains uncertain are the response of the credit institutions to such proposals; whether there are other impediments to adoption of the pollution reduction methods (from either the financial community or from the farmer); and whether there are competing alternative investments that would yield higher rates of return (and, thus be more rational choices for the investor). What can be observed is that the pollution reduction methods identified would yield up to 50 percent returns (with 3+ years for payback) -- returns that would improve the overall financial performance of the operation (from 13.7 to 15.5 percent return).

ANNEX I

ECONOMIC ANALYSIS

ANNEX I: ECONOMIC ANALYSIS

This economic analysis describes the categories and likely magnitudes of the economic costs of industrial pollution in the context of the Philippines. It then applies economic reasoning to critique existing pollution control policies affecting Philippine industry, identifying potential directions for policy changes from the standpoint of economic rationality. Finally, it describes and estimates project benefits, comparing their magnitudes with the proposed project funding.

A. Economic Costs of Pollution by Philippine Industries

Pollutants are unwanted outputs of industrial processes, generating costs defined according to several alternative accounting frameworks. Costs accrue to individuals directly in the form of decreased availability or impaired quality of desired goods and services, or indirectly through decreased production efficiency in industrial plants and the economy at large. Certain categories of costs are reflected in market prices, while other very important costs are external to market systems.

A relatively comprehensive sequence of costs recognizes avoidance costs, abatement costs, damage costs, compensation costs, and transaction costs. Avoidance costs are expenditures to minimize industrial waste and reduce risks of injury from pollutants. Abatement costs are remedial measures for pollutant removal and disposal. Damage costs are the adverse impacts on human health and the environment from pollutants which are neither avoided nor abated.

Compensation costs are financial transfers to injured individuals, communities, and other industries for losses incurred because of pollutant injury -- sometimes classified as a particular form of damage costs. Lastly, transactions costs refer to expenditures by both industries and governments to monitor, evaluate, and respond to pollution problems, e.g., costs of data management, enforcement of regulations, legal proceedings, adjudication, etc.

Pollution costs are interrelated, such that increased expenditures in one category often reduce expenditures in other categories. Thus, increments in avoidance costs reduce abatement, damage, compensation, and transaction costs. Similarly, increased spending for pollution abatement decreases other types of costs down the line. From the perspective of national economic welfare, the objective is to minimize the sum of combined costs.

Yet in practice, systems of complete cost accounting outstrip analytical capacity. This is explained by gaps in knowledge regarding pollutant dose-response relationships, incidence of cost bearing, behavioral adjustments in the presence of pollutants, and other essential informational requirements. These deficiencies are particularly pronounced in the Philippines, where efforts to understand and control industrial pollutants are recent and under-developed.

1. Framework of Pollution Costs

Among alternative frameworks for classifying the economic consequences of pollutants, a classification proposed by M. Freeman (Air and Water Pollution Control, 1982) has wide acceptance. Effects on living systems are distinguished from effects on non-living systems, and market effects are distinguished from non-market effects.

a. Effects on Living Systems (Biological Mechanisms)

-- Human health (non-market) -- morbidity and mortality

-- Economic productivity of ecological systems (market) -- yields in agriculture, forestry and fisheries

-- Other alterations of ecological systems impacting directly on human activities (non-market) -- sports fishing and hunting, wildlife viewing, outdoor recreation, home landscaping and aesthetics

-- Alteration of ecological systems with unknown consequences for human welfare (non-market) -- species diversity, ecosystem stability, weather and climate

b. Effects on Non-Living Systems

-- Industrial processes (market) -- corrosion and other materials damage, cleaning costs, waste storage, waste disposal and diminished product quality

-- Residences (market and non-market) -- materials damage, cleaning costs and property values

The composition and magnitudes of these impacts vary by economic structure and seriousness of pollution problems. Thus in the Philippines, it is virtually certain that industrial pollutants cause sickness and shorten human life, reduce yields of commercial crops and fisheries, corrode metals and masonry, destabilize aquatic ecosystems, lessen the enjoyment of outdoor recreation, and add to costs of maintaining factories and residences. Additionally, complex psychic costs and inconvenience costs are incurred by Filipinos who may fear illnesses from pollution, and who adjust living and working patterns to reduce their exposure to pollutants. While each of these impacts is hypothesized, the truly challenging issue is their relative importance and consequence, as discussed in the following subsection.

2. Judgments About Importance of Industrial Pollutants

Reliable studies on the impacts and costs of industrial pollution do not exist for the Philippines. Hence the importance of different impacts rests mainly on informed judgment.

a. Human Health

In countries where research on air and water quality is advanced, most studies point to illness and premature death as a very large component of the social costs of pollution. For example, one estimating framework for the United States in the late 1970s indicates that reduced morbidity and mortality account for three-fourths of the benefits from improved air quality (Freeman, op. cit.).

In the Philippines, DENR reports that rural households complain about pollution from industries such as piggeries and sugar mills in relation to contaminated drinking water. Water contamination is a factor in the incidence of typhoid, hepatitis, cholera, dysentery, and diarrhea. Philippine health statistics show that diarrhea is a leading cause of morbidity, as are respiratory ailments like tuberculosis. Pollution of the air and water combines with sub-standard housing and nutritional deficiencies to explain the poor health status of large numbers of Philippine households, particularly low-income households.

Toxic and hazardous substances are a part of the health risk. Rough estimates put the annual amount of toxic wastes at 20 to 40 million liters and hazardous wastes at 80 to 150 million liters. Industrial plants are the primary source of these wastes. Some of the principal health risks are associated with the following wastes (Delfin Ganapin, Jr., 1991, "Solid and hazardous waste management in the Philippines," Waste Management in the Coastal Areas of the ASEAN Region, Singapore):

- -- Sludges of heavy metals from semiconductor and other industries.
- -- High concentrations of heavy metals from geothermal plants.
- -- Organic carbons and oil residues from petroleum refineries and industrial storage tanks.
- -- Arsenic and sulfur oxides from copper smelting.
- -- Mercury from gold mining.
- -- Chromium from leather tanning.
- -- Wastes from industries producing agricultural chemicals.
- -- Heavy metals from metal plating plants; and
- -- Radioisotopes and infectious agents from hospitals and laboratories.

The industrial component of pollution may be relatively modest in many cases, and epidemiological work is not always able to separate the part played by pollutants from other causes of illness and death. Nevertheless, it is reasonable to assume that industrial pollutants are an important contributor to health problems in the Philippines.

b. Productivity of Farming, Forestry and Fisheries

This category refers to either natural or cultivated ecological systems which produce products sold in markets. Industrial pollutants affect the biological productivity of these systems, and thus the price and supply of their products.

Sulfur dioxide and photochemical oxidants -- e.g., ozone -- are linked with various types of leaf damage and reduced photosynthesis in agriculture and forests. There may also be a long-term reduction of productivity due to increased soil acidity from "acid rain." The true nature of these relationships is highly controversial in the industrialized countries, and barely studied in the tropics. In the Philippines, the primary source of photochemical oxidants is likely to be motor vehicles, rather than industries. However, coal-fired power plants may cause localized crop and forest damage downwind of the plants.

In all likelihood, most damage costs to commercial ecosystems are through water pollution rather than air pollution. Heavy metals, PCBs, acids, organic compounds, and other toxic industrial wastes can directly reduce or eliminate populations of commercially valuable fish and shellfish, e.g., crabs and lobsters in estuarine areas. Other fish and shellfish species can be rendered unfit for human consumption because of both chemical and bacterial contamination. Additionally, wastes from agro-processing industries generate high biological oxygen demand (BOD). This reduces and simplifies food chains for fisheries, further undercutting their productivity. Given the prominence of fisheries in the Philippine economy, the relationship between industrial pollutants and damage to fisheries undoubtedly ranks high among all categories of market-related impacts.

c. Other Effects on Ecological Systems

This refers primarily to outdoor recreation and aesthetic appreciation in relation to air and water quality. Some costs of dirty air and water are reflected in markets, including reduced revenues from tourism, and lessened property values for recreational sites. Other costs are mainly psychological in that the individual -- and Philippine society -- derives less satisfaction from outdoor experiences than would be possible in a cleaner environment. Still another impact is the meaning for Philippine society of changes in ecological diversity and stability, including the prospect of species extinctions in polluted ecosystems. In the Philippines, the magnitudes of these effects, and the relative contributions of domestic versus industrial pollution in explaining them, are well beyond present knowledge.

d. Costs to Industries

Pollutants in air and water raise the costs of industrial production in a variety of ways. This reduces net profits or increases product prices to consumers. An example is water pollution used as an industrial coolant or processing input if the water has to be treated with an expensive process before it can be used. Similarly, air pollutants may cause physical deterioration of zinc roofs, painted surfaces, rubber and elastomers,

electrical switches, textiles, and other materials. Certain industries like semiconductors and measuring instruments need a clean environment for their manufacture, such that suspended particulates increase production costs due to the need for special treatment of the air.

e. Costs to Residences

Besides their joint role in combination with other risk factors in subjecting household dwellers to greater probabilities of poor health, pollutants add to cleaning burdens and materials damage in residences, just as in industries. Moreover, homes and lots in heavily polluted areas should have lower property values than homes and lots in lightly polluted areas, all other factors remaining the same. This is a testable proposition, but apparently has yet to be studied in the Philippines.

B. Economic Implications of Pollution Control Policies

The policy and institutional dimensions of pollution management in the Philippines are reviewed in the document, USAID/Philippines, 1991, Sustainable Urban and Industrial Environmental Management Review, Section 2.6. The review points out that the legal framework for pollution management is extensive although not always appropriate.

Truly significant gaps are found in monitoring, regulations, e.g., covering toxic and hazardous wastes and groundwater protection, and enforcement provisions. For example, requirements for discharge permits are complicated, pollution penalties are small, and DENR has insufficient staff to oversee the legal and regulatory structure now in place. Importantly, the GOP's present system of pollution management relies almost entirely on legal and regulatory instruments, with very little emphasis on voluntary and market-based approaches.

The Industrial Environmental Management Project (IEMP) supports a wide range of policy analyses to identify how policies on industrial pollution can be improved. To complement the legal and regulatory approaches now in use, IEMP will give considerable attention to voluntary and market-based efforts. Among the policy and abatement reforms most urgent in the short term are:

-- Gaps in regulations pertaining to toxic and hazardous wastes and groundwater protection

There are few market approaches to control disposal of toxic and hazardous substances or to protect groundwater. For toxic and hazardous wastes, instruments will be mainly regulatory, but could examine the financial feasibility of a cost-shared disposal facility. Subject to careful study, operational costs might be met through a system of user charges.

-- Voluntary pollution reductions

One of the least-cost strategies to reduce industrial pollutants is voluntary action motivated by economic incentives, good will, or both. Economic incentives for the installation of pollution control equipment might be

advanced by tax credits or exemptions from tariff duties. This could be combined with a graduated system of effluent charges to make it costly not to install such equipment.This is the essence of Senate Bill No. 1259, whose economic implications need to be examined and compared with policy alternatives.

-- Distribution of authority and budgets among national, regional, and local governments

While the national government makes policies and regulations, local government units (LGUs) are charged with implementation and enforcement. For example, LGUs are expected to employ environmental managers, but there is no financing allocated for this. The Philippine Congress has proposed much legislation affecting LGUs (USAID/Philippines, 1991, op. cit., pp. 56-57), and the project could usefully assess the fiscal consequences of the various legal and organizational initiatives with respect to pollution management.

-- Policy on fee structure for non-compliance with pollution regulations

An important policy matter is to determine whether the current fee structure needs revision in light of deterrent effect, administrative efficiency of fee collection, end use of revenues, and several other criteria that might be proposed. This will lead to an assessment of revised fee structure, or policy advocating alternatives to fees.

-- Market-based instruments for management of industrial pollution

In market-based approaches, the emphasis is not so much on legal restrictions as on economic incentives. Alternative market-based incentives include effluent charges, taxes on industrial products, marketable discharge permits, and deposit-refund programs. DENR already uses an Environmental Guarantee Fund. These and other economic instruments should be compared to determine the choices of market-based incentives for pollution reduction in the Philippines.

The economic benefits of IEMP's policy component cannot be estimated ex ante, but it should be possible to define categories of benefits and costs as the proposed policy analyses are initiated and refined. The economic benefits of policy reforms are not incorporated in the following discussion of project benefits, even though it is certain that various policy revisions will have substantial consequences for allocative efficiency and distributional equity.

C. Net Benefits of Project

The economic benefits of IEMP are examined in terms of three contributions:

-- Cost savings to agro-industries and other industries resulting from the project's pollution management appraisals and ensuing changes in processing efficiency and waste handling.

-- Improvements in fisheries productivity because of reduced water pollutants; and

-- Health benefits in communities where IEMP helps reduce pollutants.

While various other categories of project benefits could be included in the analysis, these three are sufficient to justify the investment.

The social discount rate for project analysis in the Philippines is 15 percent, although NEDA is studying downward revision to 10 percent. At a discount rate of 10 percent, the financial cash flow of IEMP's expenditures has a present value of $19.8 million at project inception (using the expenditures schedule from Financial Analysis). At 15 percent, discounted expenditures have a present value of $17.8 million.

The shadow exchange rate of the United States dollar in relation to the Philippine peso is 1.20. Thus, over 10 years, the minimum benefit to justify IEMP is the peso equivalent of $23.8 million at a social discount rate of 10 percent, or $21.4 million at a social discount rate of 15 percent. The economic analysis compares estimated benefits with these minimums to reason that IEMP should have a substantial payoff for the Philippines.

1. Benefits Estimation

a. Cost Savings to Industries

The pollution reduction appraisals inform industrial managers of strategies to minimize wastes, make feasible use of by-products, and install equipment to control pollution. The first two steps are expected to produce a positive financial return for plant owners in industries such as agro-processing, although with much variability across plant size and type of industry. The third step is likely to be mainly a financial cost without demonstrable financial return. Yet capital investment to reduce industrial pollutants internalizes some portion of what was previously a negative externality, and therefore generates marginal social benefits for fisheries, health, and other sectors.

Through the five-year life of the project, IEMP will fund pollution management appraisals at industrial plants. Some of these appraisals will lead to feasibility studies of technological changes, and some of the feasibility studies will subsequently lead to actual investments in modified technologies. The generation of financial returns is on the combined base of project funds plus industry's capital and in-kind costs for investments made as the result of the Project.

Preliminary cash flow models of waste management at agro-industries suggest a real financial rate of return of about 20 percent. This is a crude estimate needing refinement after the project gets underway. Moreover, only some of the targeted enterprises will make the investments recommended by the project.

Here it is assumed that:

-- Fifty percent of IEMP's budget for "Pollution Reduction Initiative" and "Investment Opportunities" is allocated for industries having a positive payoff from pollution reduction.

-- One of every two pollution management appraisals eventually leads to a "successful" investment in modified technologies.

-- Financial rate of return on "successful" technology transfers in these industries is 20 percent; and

-- Every dollar of IEMP's funding for "successful" investments induces the equivalent of two dollar's spending by targeted enterprise owners for technology modifications.

These assumptions imply net benefits of $0.8 million annually. If these benefits begin with the onset of the second year of the project and continue for 15 years, then their present value at project inception is $5.0 million at a discount rate of 10 percent, or $3.6 million at a discount rate of 15 percent. This omits the project's possible "demonstration effects" on other firms in the targeted industries.

b. Impact on Fisheries Production

The production value of Philippine fisheries in 1989, the latest year for which data are available, was the equivalent of $2.1 billion. This aggregates the output of commercial fishing, municipal fishing, and aquaculture. Fishing provides a livelihood for 4.3 percent of the total labor force, and fish furnishes 54 percent of the protein for the average Filipino household (G. Porter and D. J. Ganapin, Jr., 1988, Resources, Population, and the Philippines' Future, World Resources Institute Paper #4, Washington, D.C.).

As is well known, Philippine fisheries are stressed because of overfishing, together with loss and degradation of fisheries habitat. Ratios of catch per effort have been decreasing through the decades, falling by a factor of six between 1950 and 1985 (D. Pauly and A. Cruz-Trinidad, 1991, "Sound ecology is good economics: four vignettes from Philippine fisheries," The Philippine Environment: Financing Environmental Conservation and Rehabilitation Projects and Programs, Manila). Yet national and international demand for fish and fish products has been steadily rising.

One factor in the declining productivity of Philippine fisheries is industrial pollution in the country's coastal zones. Mine tailings and manufacturing wastes combine with domestic sewage and agriculture chemicals to upset coastal and inland aquatic ecosytems. Documented examples include (Porter and Ganapin 1988, op. cit.):

-- The wastes of Atlas Consolidated Mining and Development Corporation have been blamed for killing or halting the reproduction of plankton and other organisms on which fish feed.

-- At Calancan Bay (Marinduque), a reported 12 thousand fishermen lost their livelihood because of the dumping of mine tailings into the bay by Marcopper Mining Corporation. Fish catch fell to only eight percent of what it was before the copper mine began to pollute the bay in 1975.

-- At Iligan Bay, mercury levels in fish exceed the 0.5 ppm limit established by the World Health Organization, and are therefore unfit for eating.

-- Subsistence fishermen along the banks of the Bigaa and Bulacan Rivers report fish kills where industrial plants have been discharging toxic chemicals into the water.

-- Several episodes of "red tide" have been recorded in various locations of the Philippines, producing what are sometimes serious fish kills. The complete explanation of red tide is not known, but red tide occurs most frequently in shallow coves and bays which are polluted with domestic, agricultural, maricultural, and industrial wastes. Red tide causes losses to fishermen, and the toxic variety poses a substantial risk of human poisonings when infected fish and shellfish are eaten.

-- Perhaps the best known case of fisheries collapse because of pollutants is Laguna de Bay, the largest inland fishery in all of Southeast Asia. In 1964, Laguna Lake produced 320 thousand metric tons of shrimp, snails, and other fish and shellfish. Within four years, the catch fell to 163 thousand tons. By the early 1980s, annual catch was only 128 thousand tons, and much of this was inedible because of fish diseases. Joined by agricultural chemicals and domestic sewage, a main explanation of declining fisheries has been the dumping of industrial wastes into the Pasig River and the lake itself from about 80 percent of 900 factories.

The project generates benefits for Philippine fisheries by reducing some fraction of industrial pollutants which currently limit fisheries output. This fraction is virtually impossible to estimate directly, especially because industrial pollutants are co-mingled with all other pollutants, and because dose-response relationships between pollutants and fish catch are not established.

Here it will be assumed that the Project increases national fisheries output by one-half percent -- i.e., 0.5% -- in perpetuity. To keep the analysis conservative, it is assumed that this marginal increase is not achieved until ten years after project inception.This allows sufficient time for industrial practices and aquatic ecosystems to respond to the project's initiatives. Based on a study for Lingayen Gulf (C. Anonuevo, 1989, "The Economics of Municipal Fisheries: The Case of Lingayen Gulf" in G. Silvestre et al. (eds.), Towards Sustainable Development of the Coastal Resources of Lingayen Gulf, Philippines, ICLARM, Manila), fisheries value-added -- the measure of benefits -- is approximately 52 percent of fisheries gross revenue. These assumptions combine for a discounted present value of fisheries benefits at project

inception of $44.4 million when the discount rate is 10 percent, or $17.2 million when the discount rate is 15 percent.

c. Health Benefits

IEMP will fund technical teams to visit about 200 industrial establishments for pollution management appraisals. This is about four percent of all establishments with 10 or more employees covered by the National Statistics Office. It is assumed that the "influence areas" of these establishments embrace at least four percent of the country's population, given that many industries are located where population densities are highest. At a conservative four percent, the project's "influence areas" are inhabited by 2.4 million people.

Three recent illness surveys by Social Weather Stations, Inc. show that from 17 to 29 percent of Filipinos are sick at some time during the two-week periods preceding the surveys (D. Arroyo, 1990, Patterns of Illness among Filipinos, Social Weather Bulletin 90-14, Manila). Average duration of sickness is 5.6 days. If 23 percent of Filipinos are sick for an average of 5.6 days per incidence of sickness, then the Philippines experiences 77 million sick days every two weeks. This is equivalent to 2,002 million sick days annually.

If the project's "influence areas" are like the national average, they incur 80 million sick days annually. The average ratio of lost work days to sick days is 48 percent (D. Arroyo, 1990, op. cit.), implying 38 million lost work days in IEMP's "influence areas" every year.

In the Philippines, the relation between exposure to pollutants and morbidity is not established. This relation is often expressed in the form of elasticities. An elasticity gives the percentage change in morbidity associated with a one percent change in a pollution variable. Morbidity elasticities used in the United States range widely from .01 to .40, reflecting a great amount of scientific disagreement on the health impacts of pollution (M. Freeman, 1982, op. cit., pp. 74-75). Thus if the Project were able to reduce pollutants by 10 percent in the "influence areas," morbidity would decrease by between 0.1 percent and 4.0 percent, with a reasonable point estimate in the middle of the range at about 2.0 percent. This implies 1.6 million fewer sick days and 0.7 million fewer lost work days in the "influence areas" every year.

Each lost work day can be valued at average daily earnings and fringe benefits per worker -- or about $4.90 (National Statistical Coordinating Board, 1990, 1990 Philippine Statistical Yearbook, Manila). To this should be summed expenditures on health care, which are about $276 million annually for the country (National Statistics Office, 1990, 1988 Family Income and Expenditures Survey, Manila) -- or roughly $0.14 per sick day. This refers to family expenditures only, and does not include health services funded by GOP. Here it is assumed that GOP's funding for health is equal to family expenditures for health. Then family plus government expenditures give a total of $0.28 per sick day.

Thus the health benefit of a hypothetical 10 percent reduction in pollutants is $0.45 million (1.6 million sick days x $0.28 per sick day) plus $3.43 million (0.7 million lost work days x $4.90 per lost work day), or $3.88 million annually in perpetuity. To keep the scenario conservative, it is assumed that these benefits begin five years after project inception. Discounted health benefits are then $24.1 million at a discount rate of 10 percent, or $12.8 million at a discount rate of 15 percent. These are not truly estimates, but rather best guesses about orders of magnitude in the absence of better information.

2. Summary

The economic benefits of the IEMP Project can be summarized as follows:

	At 10 percent discount rate	At 15 percent discount rate
	---- present value, $000 ----	
Cost savings to industries (net)	5.0	3.6
Productivity of fisheries (gross)	44.4	17.2
Improved health (gross)	24.1	12.8

Cost savings to industries are net benefits, given that they are computed as increments in present net worth. On the other hand, discounted gross benefits in fisheries and health have to be compared with discounted project expenditures before the measure of net benefits can be obtained. At a discount rate of 10 percent, this is ($44.4 million + $24.1 million - $23.8 million), or $44.7 million. At a discount rate of 15 percent, net benefits in fisheries and health are ($17.2 million + $12.8 million - $21.4 million), or $8.6 million.

At a discount rate of 10 percent, the project's net benefits are then $5.0 million for industries plus $44.7 million for fisheries and health, for a total of $49.7 million. At a discount rate of 15 percent, net benefits are $3.6 million plus $8.6 million, respectively, for a total of $12.2 million. Thus the project is economically viable under present assumptions, but is highly sensitive to the discount rate. This sensitivity is explained by the fact that project benefits in fisheries and health are heavily weighted towards the future.

Also important is the relatively large magnitude of benefits external to the targeted firms which receive the pollution management appraisals. At either discount rate, benefits in fisheries and health greatly exceed those captured by industry itself. While the data and assumptions used here are highly tentative and sometimes only illustrative, the overall result is not surprising. Pollution reduction has a social payoff substantially greater than financial gains to industries, as the current estimations demonstrate.

ANNEX J

SOCIAL SOUNDNESS ANALYSIS

ANNEX J: SOCIAL SOUNDNESS ANALYSIS

A. Introduction

One of the major costs of pollution is the toll on human health. The concentration of population into urban industrial areas has aggravated pollution problems. Industrial waste problems are the result of cities with industries that have grown very rapidly and lack treatment facilities and waste disposal areas.

Toxic and hazardous wastes are disposed in municipal dumps or on-site with little regard to their impact on public health and the environment. These conditions produce direct hazards to scavengers and the communities near the dump sites and contribute to the leachate problem which results in its direct entry into groundwater, rivers, lakes, or tidal waterways.

The project's outputs will involve technical assistance in pollution reduction, technology transfer, training, policy analyses and public/private dialogues. It is extremely important that the project take into account the socio-cultural conditions of the Philippines which vary by region and industry if it is to be successful. Social soundness analysis is necessary for each sub-project and must take into account the cultural diversity and physiography of the Philippines and allow for flexibility and adaptability for each project identified.

B. Project Beneficiaries

The principal beneficiaries of the project will be the individual industrial firms, their employees, and the surrounding communities. Industry will benefit economically in terms of improved gross income and increased profits. Improved pollution control methods and techniques will improve the heath of the employees, improve the quality of life of the communities within the proximity of industries, and promote the survival of those ecological ecosystems which these communities depend on for their survival.

1. Issues Pertaining to Beneficiary Communities

The project has three components: a pollution reduction initiative; policy analysis and public/private dialogue; and institutional capability building. To analyze the compatibility of project design to characteristics of the beneficiaries, it is important to look at the issues which are of particular concern to these beneficiary communities and their respective socio-cultural systems. Relevant issues discussed below pertain to the effects of pollution on health, the socio-cultural system of the industry, and those industries that have sparked controversy among the different sectors of Filipino society. These issues highlight the finding that pollution has adversely affected these communities and, therefore, reduction of pollution will benefit these communities.

a. Pollution and Health

Until recently there was little information in the Philippines regarding the effects of pollution on human health. One of the first studies was by the College of Public Health of the University of the Philippines, which addressed the problems of mercury pollution in the gold rush areas in Mindanao.

This study was done in 1988 by Maramba to determine the extent of mercury exposure in the gold rush areas of Davao del Norte. A cross-sectional survey was conducted with 230 volunteer subjects. Six percent had elevated blood mercury levels, while 4 percent had elevated urine mercury values. Forty-seven percent had elevated blood pressure and gray focal deposits in the gingiva (Maramba, 1988). Only 26 percent of the subjects used some form of intervention devices such as facial covers or masks, boots and/or gloves. Only 9 percent attended meetings or seminars on the safe use of mercury.

Retorts to lessen the risk of exposure to mercury vapor have been introduced by each regional office where small scale mining is present. However, where regulations prohibiting the use of blowtorches are present, they have not been enforced for example in Benguet Province. This is because in their policy formulation, the government did not consider the socio-economic, technological and environmental systems of the small-scale miners of Benguet Province. If they had this information they would have realized that there are two distinct groups of small scale miners: traditional small-scale miners and gold rush small scale miners. Traditional small-scale miners with a mining tradition at least 400 years old do not use mercury. Therefore the regulations for the use of retorts and their distribution in the region was impractical.

Another study was conducted by the Department of Health regarding respiratory illness associated with air pollution in Toledo City, Cebu. In 1988 the local press reported a rising number of children with primary tuberculosis in two elementary schools in Toledo City. The increased rate of primary tuberculosis was suspected to be related to pungent emissions from a coal conversion plant from the Atlas Consolidated Mining and Development Corporation which has three industrial plants in Toledo City: Atlas Fertilizer Corporation, Atlas Consolidated Mining and Development Corporation Power Plant, and Atlas Foundry. The two elementary schools were located 350 meters away from the industrial plant. They had a total of 2,879 pupils, mostly children of Atlas Mining workers. Fifty percent of the total population of Toledo City is employed by the mining company.

Environmental inspection by DOH personnel revealed excessive dust emissions, unpleasant odors and acid fumes within the plant premises. According to the health workers the plants and trees within the vicinity were scorched due to the hot gases emitted from the industrial plant. The study was limited by the lack of instruments to measure the amount and kind of pollution which could have been correlated with the data gathered.

The health workers studied 276 children, of which 156 were designated as "the exposed group" and 120 "not exposed group." Exposed children complained of coughs, dizziness and red eyes more often than those not exposed. The school physician diagnosed 70 percent of the children with primary tuberculosis.

However, chest x-rays showed only 6 percent positive. There was a high correlation of increased emergency room visits for respiratory diseases when boilers of the plants were in use.

For the semi-conductor industry in Metro Manila, the most common illness in the industry are upper respiratory infections (38.77%). Only 11 percent of the 18 semiconductor companies surveyed complied with the Occupational Safety and Health Standards provided by Department of Labor and Employment (DOLE).

DOLE observed that, out of 18 semiconductor companies, 39 percent had poor ventilation and 27 percent had defective exhaust systems. These problems probably contributed to the incidence of upper respiratory infections. In terms of the handling of hazardous materials, four companies did not provide appropriate labels on containers of hazardous materials; ten companies did not have the means for emergency removal or detoxification of hazardous materials near the workplaces where these were being handled; five companies were found to have material handlers lacking the knowledge of proper handling and the knowledge of the possible illnesses which may arise from mishandling of these materials; and the workers in 11 companies were observed not wearing appropriate personal protective equipment.

DOLE noted that reasons for the above were workers' ignorance regarding the use of protective equipment, lack of supplies, or the workers' were not comfortable wearing the equipment. It should be noted that 27.78 percent of the companies had organized safety committees while another 22.22 percent had less well organized safety committees. In four companies the safety personnel did not have training in safety or health. Half of the companies surveyed did not submit safety and accident reports to the proper government authorities.

b. Industrial Pollution and the Community

Since 1986 there has been an increase in peoples' organizations and non-government organizations (NGOs) involved in environmental protection. Where industrial pollution has destroyed fish and agricultural habitats and threatened the health and safety of the communities within their proximity, there has been an increase in environmental activism from people's organizations and NGOs.

Letters of complaints addressed to EMB indicate that the swine industry is the major cause of complaints. The complaints concerned the smell and the pollution of waterways from pig wastes. Other letters came from NGOs or local government officials who complained about the smell and pollution of waterways from the poultry industry and water and air pollution from a canning factory.

One of the better known protests was against Marcopper Mining Corporation for dumping mine tailings into Calancan Bay (Marinduque Island). The leaders of this protest belonged to an NGO called Lingkod Tao-Kalikasan (LTK). LTK undertakes community organization and environmental education to enable local communities to assess and respond to environmental problems in their areas. LTK's efforts paid off in 1988 when the DENR ordered Marcopper to adopt a less destructive disposal scheme.

Another issue-based environmental advocacy effort took place in 1987 with a group of professors and engineers from the Philippine Institute of Chemical Engineers. They successfully protested against the adoption of a major incineration scheme in Iligan City. This scheme entailed utilization of wastes imported from industrialized countries to fuel the incinerators, and the professors and engineers feared the incineration would cause the emiss of unknown pollutants into the atmosphere (EMB, 1989).

A broad alliance of Metro Manila-based NGOs in 1988 launched a campaign against smoke-belching vehicles in the city. The NGO was called Groups Against Smoke-Pollution (GASP), and was headed by the Bishops/Businessmen's Conference for Human Development and other private associations. Although t campaign had to give way to the transport crisis, this mobilization of NGOs and private corporations proved how important networking was for important issues. One of the areas currently protested by both NGOs and peoples' organizations is the Pasar Copper Smelter Complex in Leyte.

Attention is easily focused on those industries that have sparked considerat controversy due to the negative effects of their pollutants on the communiti around them and upon the ecosystems on which these communities depend. However, equal attention must be focused on those industries located in the Philippines that have proven skills and technology to reclaim and recycle waste efficiently. One such example identified during this study was International Farm Corporation (INFARMCO), a piggery located in Cabuyao, Laguna.

The whole industrial area is planned so that every variable in the recycling model provides optimum input for increased production and efficiency. Research and development in all the components of the industry are continuously encouraged by the corporation.

The corporation also organized International Farm Cooperative, a non-profit non-government foundation. This NGO was formed for the following reasons:

-- To continue and facilitate research and development that w started by the subsidiaries.

-- To function as a vehicle for additional funding; and

-- To function as a means for facilitating the spread of the technological benefits which they have to offer through th identification of a broad market.

The NGO is presently being financed by the European Economic Community while prior funding was by PNOC. Linkages were made or markets identified through friends. The foundation is presently formalizing a memorandum of agreement with SUSI Foundation, a cooperative based in San Jose, Batangas which manage 2,000 hectares of paddyland. INFARMCO Foundation will provide technical advice and training so that the SUSI Foundation can process and recycle its waste from the poultry farms from which 70 percent of the residents derive their livelihood.

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C. Socio-cultural Profile of Philippine Industry

The Philippine industrial scene is dominated by Chinese, Filipinos and foreigners. Companies are either family owned or non-family owned (Kunio, 1985). The work force is usually all male or all female, depending on the type of industry; rarely is the work force at a plant evenly divided as to the sexes. In agro-industry, with the exception of fish canneries, males predominate as workers. Where assembly is required as in the fish canneries, women predominate. The majority of the workforce in the semiconductor industry is female.

There are distinct differences between a Chinese company and a Filipino company. A majority of the Chinese businesses are family-owned (85%), while only sixty percent of the Filipino companies are family-owned. The reason for this is because the Chinese have a longer business history in the Philippines and are more likely to possess the capital necessary for investment. Moreover, the Chinese who attach great importance to the family as a unit of social organization, trust members of the family and are reluctant to trust outsiders. This is especially true in terms of money matters. Therefore, it is atypical for a number of Chinese families to pool their resources in order to form a single company. The non-family Chinese owned companies like the Philippine Blooming Mills and Bataan Cigar and Cigarette Factory were formed by those who belonged to the same lineage group.

In contrast, there are more non-family owned companies among Filipinos. This is because in business ventures Filipinos are able to cross family lines more easily than the Chinese. This is attributable to the bilateral kinship group with ritual kin. Filipinos can pool the resources of different families and they form groups to raise the necessary capital for business ventures. During the post-war period Americans who wanted to sell their companies approached Filipino investors and not Chinese. During this period when American companies were Filipinized, the Chinese were not involved in any of the transfers. If Chinese were involved it was effected together with Filipino investors.

It is interesting to note that in terms of business take-overs, the Chinese have a weak image compared to Filipinos. Kunio (1985) attributes this to the fact that the Chinese are at a disadvantage in take-over bids where huge amounts of money are involved. It is usually more difficult for Chinese to pool the resources of different families. Any take-over bids will be on an individual basis. Filipinos on the other hand can form groups or networks and these groups are able to raise the necessary capital. Moreover, when compared to the Chinese the Filipino groups are generally better connected with the government and other sectors which places them in a more favorable position when it comes to some business ventures.

There is not much information on the ethnicity of the agro-industry or if the Filipino owned semiconductor industries are of Chinese or Filipino ethnic affiliations. A majority of semiconductor firms in the Philippines are owned by foreigners.

Many of the semiconductor firms which engage primarily in the assembly of semiconductor devices were established during the mid-1970s. The most dramatic growth of the industry was from 1973 to 1984, expanding at an annual rate of 53 percent. The factors responsible for this growth were because American, European and Japanese electronic multinational companies established offshore plants for the most labor intensive phase in semiconductor production, i.e., assembly. There are many multinational companies in the Philippines because the labor is cheap and literate and trade unionism remains under strict regulation.

Employment within the semiconductor industry is dependent on world markets and is thus unsteady. Overall contribution of the semiconductor workforce was small (0.17%) from 1977 to 1985. Eighty-five percent of the workers in semiconductor industries are women in direct production work while 15 percent are men in maintenance and supervisory functions. Most of the women are unmarried and 16 to 25 years old.

The Department of Labor and Employment conducted a survey of 18 semiconductor firms in Metro Manila. The DOLE study defines two kinds of semiconductor industries in the Philippines: those owned by multinational corporations and those owned by Filipino investors. The multinational corporations are direct manufacturers of semiconductor devices, while the local counterparts are subcontractors. While they produce the same products, there is a difference between the two in terms of facilities and services offered. The working conditions are different for both groups and DOLE attributes this to the ownership of the companies involved.

D. Compatibility of Project Design With Beneficiary Community

When considering the effects of pollution on health, the controversial issues that have sparked environmental activism and the socio-cultural system of the Philippine industry, the project design is compatible with the beneficiary communities. The information so far discussed provides a brief overview of the various industries, and the industrial pollution problems associated with some of these industries.

The participating industries will look at investment opportunities, which are one of their main incentives for change. Many are not aware that they can increase profits by reclaiming and recycling industrial wastes. By recycling they can actually cut down on raw material cost as was discussed in the INFARMCO example. A majority of the industries are not aware of what specific pollutants within their systems adversely affect the human and natural environment. Moreover, they are not aware that workers' productivity can be increased by providing a healthier and safer environment.

However, one of the more important determinants of whether the project design will work is Philippine culture itself. The project is attempting to overlay industrial pollution management techniques and technologies on Philippine industrial culture. It is absolutely necessary that the socio-cultural characteristics of industry and those communities around industry be understood by the project proponents.

E. Socio-cultural Compatibility

Filipinos are a group-oriented people. The description of Filipino-owned companies has its roots in basic organizational structure of the Philippine society which is the bilateral kinship group. Human relationships are expanded through ritual kinship (compradazgo system) which focuses on social and economic reciprocal relationships which are outside the bilateral kinship group. What evolves is a group distinct from other groups and within such a group will be a hierarchy of persons with socio-political or socio-economic power and authority. These distinct groups composed of reciprocal relationships with other groups result in a complex network of interrelationships.

The social dynamics that takes place within these groups are quite complex. In the maintenance of smooth interpersonal relationships, for example, long-term social benefits may determine what economic choices a group or an individual makes. Because of its structure there is generally an element of trust and loyalty within these networks.

It is the same basic processes that take place within the Filipino-owned industrial companies and the NGO network system. In NGOs observed and interviewed in the past three years, there was always a friend or a relative in the sub-group linkages that was used as an entry point in facilitating the desired inter-relationships with another NGO, a community, a local government unit, or a government agency. Filipinos' kinship system therefore continues to play an important institutional function as a cohesive force which facilitates the networking process.

F. Multisectoral Activities

There are at present multisectoral activities addressing industrial pollution. A sector focal point in many of the issues pertaining to environmental awareness and advocacy are the NGOs. Some of them are working either with industry or are adversaries to industry. Constraints to the receptivity of industry will vary depending on ethnicity and the social and political milieu. Where industry is in an adversarial relationship with the surrounding communities, industry will not be receptive to project implementation. On the other hand, these same industries can later observe those successful and economically beneficial pollution reduction projects funded by USAID as models which they may seek to duplicate.

The process of organizational linkages between the private and public sector has been effectively mobilized or inspired by the NGO sector to make the project design receptive to the beneficiary communities. The organizational structure that will make for the receptiveness of project design is already in place. Concern with industrial pollution by the communities around industry through the NGOs advocacy, community organizing, environmental education and activism will make these groups receptive to the project.

G. Beneficiary Participation

The above processes allow for the analysis of realistic opportunities for beneficiary participation. As noted earlier, various regions throughout the Philippines have organized themselves in addressing pollution problems through advocacy, environmental education, and community organizing or environmental activism.

As of 1989 there were 30,000 NGOs in the Philippines. From 1986 to the present there have been an increasing number of alliances and networks with environmental concerns. Other large networks involved in community development have also taken an interest in environmental issues. Because of the awareness and successful efforts in the environmental sector, there will be communities near industrial sectors which will be receptive to project participation.

There are also industry models -- e.g., INFARMCO -- of indigenous technology which have successful pollution reduction systems. These models will provide industry with incentives to participate in the project as they demonstrate the successful research and development efforts of local industry. Filipinos have been known for their technological ingenuity. A classic example is the jeepney. Tapping the talents of Filipinos' technological innovations through the identification and continued application of successful indigenous technology will encourage or even stimulate participation in the project.

Industry can no longer be unaware of environmental concerns regarding industrial pollution. There is an increasing advocacy and awareness in the general public not to make industry increasingly aware and in the process even educated in environmental concerns. Moreover, issues regarding the industrial sector are being resolved through combined efforts of the community, NGOs, local government units and EMB. Besides its own monitoring system, EMB is made aware of environmental issues regarding industrial pollutants through the letters of residents in close proximity to the industrial plants or through NGOs who are either community based or are intermediary organizations of larger NGOS.

When community-based NGOs work with both EMB and local government units in the monitoring of certain industries, EMB is the lead proponent in setting the standards and the time table for compliance by the respondents. Compliance is always by compromise to give respondents the time to improve their facilities.

Prior to 1989 much of the NGOs participation with EMB was taking part in the informal report preparation of specific issues, the attendance at workshops and in policy formulations. After 1989 EMB encouraged the participation of NGOs in the implementation of projects -- e.g., river rehabilitation -- or in the inspection of firms. While EMB acknowledges the lack of technical expertise of the NGOs who assist in monitoring, they feel that this sector has created a significant impact in increasing the environmental awareness of communities and in stopping or minimizing pollution from specific industries. It is therefore the continuing policy of DENR to actively involve the participation of the NGO community. The joint efforts by EMB, local government, industry and community-based NGOs where the project will be implemented will make participation by beneficiaries more effective.

The main social and political constraints for this project will be based on the ethnicity of the companies being targeted; the presence of conflict between industry and the community, and the non-participation of vital sectors of those within the public and private sector that can make an impact on better environmental management for pollution reduction initiatives.

As mentioned earlier there are distinct socio-cultural differences between Chinese owned companies and Filipino owned companies. These barriers are not absolute by any means. A more detailed analysis and research concerning industries' socio-organizational structure and their networks can lead to answers that will encourage their participation in the project.

Areas where hostilities arose like the DOH experience in Toledo City will constrain project implementation. Similar constraints will occur in those areas in the Philippines where there is social and political unrest.

The non-participation of a key person representing a vital sector within either the public or private sector which is important for facilitating project participation by the beneficiaries will also be a social and political constraint.

H. Spread of Benefits and Equitable Distribution

The project will improve human health and upgrade the value of property and the quality of life of communities within close proximity to the industry. The health of children who are more susceptible to the health hazards of industrial pollution will be improved. Subsequently, their attendance record and performance in school will improve. Adult men who predominate in the agro-industry and adult women who predominate in the semiconductor industry will also have improved health. Besides improving the health and the quality of life of communities around industry, the long term benefits of reducing pollution will ensure the survival of those ecological systems that sustain human life. The survival of these ecological systems necessary for the ultimate survival of man cross-cuts sex, age, ethnicity, social and political groups. Benefits are equitably shared by all.

The project can be replicated in other areas and the benefits will spread if social and political barriers are overcome and industry will see the increase in gross income and net profit. The multisectoral approach of the project to include industry, the government -- e.g., EMB, LGUs -- and the local community -- e.g., NGOs -- will allow these sectors to work together in a less adversarial relationship to solve their shared problems.

The networking process utilized by the NGO community is an effective mechanism for project benefits to spread. They have become useful mechanisms for upgrading the service delivery mechanisms of the government. In areas pertaining to environmental concern some possess advanced capabilities in such areas as program management, credit administration and community organization. These NGOs have publications found in universities and NEDA on successful training techniques and popular education approaches which involve a voluntary and participatory approach by beneficiary groups.

The successful NGO organizations in the Philippines when looked at as separate organizations will not have all the capabilities necessary for a project. Linkages or networking with other NGOs and to related private and government sectors has always been an ongoing process. Increasingly, these efforts of networking are becoming the goal within the NGO community to provide services such as technical assistance and training to the other NGOs which do not have such capabilities. There are industries with NGO subsidiaries. There are also industries whose employees are members of other NGOs with technical expertise. Project benefits can be spread through memorandum of agreements. Some joint efforts between the private sector and public-private sector are formalized with memorandum of agreements.

Others are less formal and one sector may need the assistance of the other as "entry points" into specific communities to meet their own respective program objectives. For example, in the current work of the UP Department of Environment and Occupational Health they were assisted by two environmental NGOs from Leyte in getting community support. UP is willing to give training workshops to the community such as water testing and record keeping of environmental complaints so that these may stand scrutiny in court. The Public Health Department is willing to facilitate these workshops, but they acknowledge that their skills are limited in terms of garnering community support. Again the interactive process of two sectors with both meeting specific objectives within their respective organization is part of the networking process.

I. Sustainability

The organizational structure that is evolving within the inter-sectoral groups has its roots in the socio-cultural organization of Philippine culture. The examples previously discussed illustrate the interactive mechanisms which take place within the organizational structures of various groups. This is a process that has been happening more and more within the past two years. This is especially true in the public-private policy dialogue and in the availment of technical training and institution building in each of these organization's environmental concerns. Therefore, the public sector through DENR, NEDA, DTI and LGUs and the private sector through industry and non-government associations and citizenry participation, should continue to be active participants throughout the project's implementation. Active participation by these sectors are necessary for the project's sustainability.

Entry into the industrial sector and implementation of the appropriate technologies can be facilitated by the identification of the organizational structure within each industry and those aspects of Philippine culture which are prevalent within industry. A survey of industry and the communities within and around industry can be conducted as a first step towards identifying those "entry" points, keeping in mind those behavioral patterns present in Philippine culture that will make for the identification of incentives that can be applied.

Filipinos' input in this project who will be important for project continuity can be identified through this same process. Identification of indigenous technologies presently being used like the agro-industry identified in Laguna

(INFARMCO) or the traditional small scale miners of Benguet Province must also be identified before the introduction of new technologies. Tapping these local resources in terms of personnel and technology will enhance project participation and contribute to the project's sustainability.

A voluntary and participatory approach by industry is also recommended. Their active involvement in project planning, implementation, monitoring and evaluation will make them aware of their own capabilities and resources in solving their problems related to industrial pollution.

Bibliography

Bureau of Working Conditions. 1985. Report on the Survey/Study of the Working Conditions in the Semiconductor Industry. Department of Labor and Employment. Kunio.

Cortes-Maramba, N. et al. 1989. A Cross Sectional Study of the Health Impact of Mercury Exposure Among Workers in Gold Processing in Davao del Norte. College of Public Health. University of the Philippines, Manila.

Environmental Management Bureau. 1990. The Philippine Environment in the Eighties. Department of Environment and Natural Resources, Manila.

IBON Databank Phils., Inc.. 1990. "The Semiconductor Industry." IBON Databank Phils., Inc. Manila.

Lofranco, V.S., I.N. Pastor and M.E. White. 1989. "Investigation of Respiratory Illness Associated With Air Pollution in Toledo City."

Trudinger, J. et al. 1991. "Formulation of Policy and Standards for the Disposal of Mine Tailings From Mining Operations in the Philippines." Dames & Moore, Manila.

List of Individuals Contacted

Ms. Ella Deocadis - Assistant Director, EMB
Dr. Leslie Bauzon - Chairman, Philippine Social Science Council
Dr. Elma Toress - Department of Environmental and Occupational Health, College of Public health, University of the Philippines
Dr. Jane Baltazar - Director, College of Public Health, University of the Philippines
Dr. Mark White - Department of Health
Engr. Romeo Certeza - Facilities Maintenance Engineer, Motorola
Mr. Rey Camangon - Taihon Chemicals & Services, Inc.
Mr. Tony Chua - President, INFARMCO
Mr. Greg Calixto - BEST, Inc.
Engr. Mariano S. Venida, Jr. - General Manager, Best, Inc.
Mr. Danilo S. Venida - President, Best, Inc.
Dr. Luz Pascual - Department of Health
Dr. Wilson Estrada - Department of Labor and Employment
Ms. Lorna Makil - Philippine Social Science Council
Mr. Roberto Alonzo - Economist, University of the Philippines
Dr. Phillip Medalla - University of the Philippines
Mr. Noel de Dios - University of the Philippines
Dr. Alexander Herrin - Health economist, University of the Philippines
Mr. Raul Tejada - EMB

ANNEX K

ADMINISTRATIVE ANALYSIS

ANNEX K: ADMINISTRATIVE ANALYSIS

A. INTRODUCTION

1. Scope of Investigation

The following examines the institutional capacity and ability of the organizations that have direct responsibility for the administration of project activities. While there are numerous organizations from both the public and private sectors that will play a role in project implementation, either as participants or as beneficiaries, the Department of Environment and Natural Resources (DENR) will be the lead governmental agency for project implementation and will serve as the overall project coordinator. This role is consonant with the mission and charter of DENR, which is to be the premier governmental institution with regard to environmental management and protection. Among the other institutions that will be involved in project implementation are the Department of Trade and Industry, the various industry associations, individual firms that volunteer to participate in the Pollution Management Appraisals, business- and environmentally-oriented Non-Governmental Organizations (NGOs), and Local Governmental Units (LGUs).

The scope of this investigation is, however, largely limited to the institutional capabilities of DENR, as it will provide the primary institutional structure for performance of project activities which will be performed. Among the administrative issues that will be examined are the legal status of DENR, its financial status, organizational experience, pattern of organization, and management structure and capability (with particular reference to its delegated authority, the experience and capability of its managers, and its staffing patterns and workload). These factors will be examined in light of the proposed implementation plan for the project. An assessment of DENR capacity to meet the needs of the project will then be made to determine if it possesses the requisite capability to adequately address the needs of the project.

2. Project Proponents and Counterparts

As discussed above, the project proponent is USAID/Philippines, while the principal GOP counterpart will be DENR. It should, however, be noted that the project is oriented toward extending assistance to the private sector, particularly industrial organizations, on a voluntary basis to achieve reductions in pollution from their facilities.

As the lead governmental agency for IEMP project implementation, DENR will be responsible for interagency coordination, conduct of the public/private sector dialogue and coordination, and for management of project activities. Assisting the DENR will be the Department of Trade and Industry (DTI).

Functional management of the project by DENR will be accomplished through a project management unit headed by a DENR representative. The project management unit will be supported by the Environmental Management Bureau of DENR, which will provide staff support. The project management unit will provide guidance throughout the project implementation period, ensure

continuity in policy formulation and implementation, and coordinate project activities with other GOP agencies and private sector groups. Day-to-day managerial responsibility will be placed with the project coordinator.

Working groups may be formed to provide input on specific topics to the project management unit. Working groups may be composed of representatives from Local Government Units (LGUs), regional development authorities, industrial and trade associations and chambers of commerce, and public interest groups. The working groups will take an active role in specific work on policy issues and options. It is anticipated that the working groups will provide a valuable base of knowledge on local situations and specific industry concerns.

The USAID Office of Natural Resources, Agriculture, and Decentralization (ONRAD) will be the technical office responsible for overall project coordination, implementation, and monitoring. Other USAID participants in project implementation and monitoring include the Office of Capital Projects, the Private Enterprise Support Office, Contract Services, and the mission Legal Advisor, Program Economist, Controller, and Development Resources Management officers.

3. Tasks and Roles/Project Requirements

There are numerous activities identified within the framework of the IEMP Project. The tasks and institutional roles associated with each are discussed below. DENR has a continuing involvement throughout the project, as does the private sector. Other entities play a lesser role.

The underlying philosophy that has been employed in the design of the project has been to recognize the different goals and objectives of the public and private sectors while seeking to facilitate the dialogue between them regarding pollution reduction and environmental management. To this end, the Pollution Management Appraisals are oriented toward the private sector as a means for them to gain a better appreciation of the opportunities that they have to reduce the pollution from their facilities and the measures that could be implemented to achieve those reductions.

The Environmental Risk Assessment is oriented to the public sector as a means of assisting them in the prioritization of regulatory actions on the basis of need. This approach implicitly recognizes the resource constraints confronted by the public sector (in this case, EMB and DENR regional offices) in meeting goals and objectives that have been defined as legislative mandates. Both the public and private sector would be the recipients of training, albeit on somewhat different topics, and both would benefit from the policy dialogue.

The role for DENR as principal counterpart agency would include the provision of guidance to the project implementation team with respect to the policies of the GOP and to ensure that the overall policy guidance contained in the Philippine Strategy for Sustainable Development serves as the policy backdrop for all project activities. Among the specific responsibilities of DENR as the lead agency will include: project management, provision of counterpart staff to support the Environmental Risk Assessment team, provision of facilities and equipment, identification and availment of staff for training

purposes, and serving as the principal facilitator and interface with other government entities as they become involved in the project.

DTI will support the project by facilitating interaction between the public and private sectors and the IEMP implementation contractor(s). The staff of the Board of Investments and the regional offices of DTI are expected to provide valuable insights into the GOP industrial investment policy and strategy. These groups will also benefit from the establishment of a multi-sectoral dialogue with regard to environmental policy. DTI responsibilities will include assistance in identifying industry groups potentially interested in participating in the PMA program and facilitating and coordinating contacts with various industry trade associations and individual firms. It is also anticipated that DTI personnel will avail of training opportunities under the project.

The project working groups will include representatives from industry trade associations, professional groups (such as the Pollution Control Association of the Philippines, Inc.), and the various chambers of commerce (including the Philippine Chamber of Commerce and Industry and the American Chamber of Commerce). These organizations will play a critical role in deepening the dialogue between the government and industrial firms on issues of responsible corporate environmental policy, pollution reduction equipment and processes, and other issues. Participation of these organizations will also be essential in coordinating industry perspectives on DENR regulatory actions, as well as encouraging greater flows of communication between industrial firms and communities.

Non-government organizations (NGOs) and public interest groups will be represented in the project working groups. NGOs will serve their constituencies in communicating viewpoints to the DENR on formulation, implementation, and evaluation of new government policies and regulations and as an effective conduit for transmission of government and industry concerns on pollution problems to their memberships and the general public.

Individual firms play an integral role in the IEMP project activities and are the focal point for efforts to reduce the level of pollution from industrial facilities in the Philippines. As such, individual firms are expected to be involved throughout the project, with particular emphasis on PMAs, training, and investment opportunities. Both individual firms and trade and industry associations will engage in the public/private sector dialogue with DENR, NGOs and communities.

B. DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

1. Legal Status

The Department of Environment and Natural Resources was created in June 1987 through the conversion of the Ministry of Natural Resources and the integration of various other agencies. Among the agencies integrated into DENR were the National Pollution Control Commission and the National Environmental Protection Council, which became the Environmental Management Bureau. Also integrated was the Pollution Adjudication Board as a function of the Office of the Secretary of DENR, who serves as the Chairman.

While the creation of DENR represented the consolidation of much of the government's bureaucratic machinery with respect to environment and natural resources, there remain an extensive array of agencies whose jurisdiction concerns these areas. Among the governmental agencies that have some measure of responsibility are the Departments of Health, Public Works and Highways, and several agencies (such as the MWSS and LWUA). However, the creation of DENR represents a significant step toward the integration of responsibility into one line agency at the Cabinet level.

DENR has responsibility for the conservation, management and development of natural resources (forest lands, mineral resources, and protected areas -- coastal resources and fisheries are outside its purview) and the administration and enforcement of environmental regulations. The principal functions of DENR are performed through several bureaus and through its regional offices; line responsibility for most functions lies with the regional offices, with the staff bureaus serving primarily an administrative/ advisory function.

The line functions of DENR have been decentralized to a large extent, and are managed through its 13 regional offices, which report to the UnderSecretary for Operations (and to three Assistant Secretaries for Luzon, Visayas, and Mindanao, respectively). Each Regional Office is managed by a Regional Executive Director (RED) and is divided into sector units (Environment and Protected Areas, Mines and Geosciences, Forest Management, and Lands). Each of the sector units is managed by a Regional Technical Director.

The staff functions of DENR are met by six staff bureaus: Environmental Management, Ecosystems Research and Development, Protected Areas and Wildlife, Mines and Geosciences, Forest Management, and Land Management. The first three of these report to the Office of the Under Secretary for Environment and Research; the latter three report to the Office of the Under Secretary for Natural Resources Management. The Secretary of DENR is also supported by Under Secretaries for Policy and Planning and Legal Services.

For the first several years of its existence, DENR underwent a reorganization to implement the policy agenda of the government with respect to decentralization of the decision-making apparatus of government. This has entailed the strengthening of its regional offices and the deemphasis of the central office as the source of routine decisions. Among the reforms attempted in the reorganization were: consolidation of all major natural resource and environment functions within a single agency; decentralization of staff from Manila to regions and provinces; decentralization of decision-making; engage into active consultation with the public with regard to departmental policies, programs, and projects; and to overcome its image as a corrupt regulatory agency to a more enlightened development institution. By and large, DENR has been successful in these reforms.

DENR has had considerable success in meeting the goals and objectives of its reorganization, particularly with respect to its natural resources management functions. With respect to its environmental regulatory functions, however, decision-making has remained, to a large degree, centralized as a result of resource constraints serving as effective obstacles. The Environmental Management Bureau has continued to serve both staff and line functions,

particularly in fulfilling its regulatory functions. The functions of EMB are discussed below as they pertain to its ability to effectively meet the administrative challenges of IEMP.

2. Financial Status

Budget allocations for DENR (and its predecessor agencies) declined in real terms between 1981 and 1986. This decrease reflected the decrease in funding available as their economy experienced negative real growth rates in much of that period. Between 1986 and 1990, the budget for DENR increased by over 500 percent, much of which was occasioned by the increased concern over the depletion and degradation of the country's forests.

Environmental functions in DENR receive approximately 10 percent of the departmental budget, with the remainder going to forest management activities. The combined budget for EMB and the environmental management sector units within the regional offices were about $1.5 million in 1989 (P41.6 million), or an increase of approximately 98 percent over 1988 budget levels. The budgetary levels are concentrated in EMB, which accounted for 33 percent of the environmental budget. Only three regional units (in the National Capital Region and Regions 1 and 4) received more than P3 million. Based on the budget support extended to the environment sector and the authorized employment levels, it is clear that most of the budget is consumed by salaries and wages.

Of particular concern are the recent reductions in the operating budget for DENR. Austerity measures prescribed by the IMF have resulted in decreases in both operating funds and in the elimination of management positions at the departmental level. Congress has mandated a reduction in the number of Under- and Assistant Secretaries in all government departments to three of each. In addition, there has been a continuing issue with respect to the availability of counterpart funding to support donor activities (including the availability of staff, office and other facilities, and travel funds for staff and management support). The lack of funds to support these activities is, however, recent; the effect on DENR's ability to support donor funded activities has not yet been fully ascertained.

3. Pattern of Organization

The organization of DENR has been described above. Basically, it is a line agency with both operational and staff support functions, responsible to a Cabinet-level Secretary. Coordination with the activities of other departments on environment and natural resource-related matters is handled through Cabinet-level dialogues or through inter-agency consultative committees.

The Environmental Management Bureau has a Director and an Assistant Director who report to the Office of the Under Secretary/Assistant Secretary for Environment and Research. EMB is divided into four divisions: Environmental Quality, Research and Development, Legal, and Environmental Education. These divisions serve a staff support function to DENR and the government as a whole -- either through its regulatory functions or in an advisory capacity.

Among the regulatory functions filled by EMB are those legislatively mandated to it, such as the EIA system and various permitting responsibilities. There is, however, no direct relationship between EMB and the Environment Sector units at the Regional Offices (these units ultimately report to the Under Secretary for Operations). Thus, EMB provides assistance to the Regional Offices on the request of the RED on the basis of perceived need rather than as a matter of course.

EMB also serves as the staff for the Pollution Adjudication Board (PAB), which is the entity responsible for issuance of Environmental Compliance Certificates (which are the basic environmental permits) and for decisions regarding enforcement actions to be taken by DENR and EMB. The Secretary of DENR serves as the Chairman of the PAB.

As part of the reorganization of DENR, considerable attention has been paid to strengthening the capabilities of the Regional Offices as a precursor to decentralization of decision-making to those offices. At present, there are 14 administrative regions (including the National Capital Region). Each Regional Office is headed by a Regional Executive Director and has Regional Technical Directors for each of the sectoral units, such as the environmental management unit. The Regional Executive Director reports to the Under Secretary for Operations.

4. Management Structure and Capability

As described above, DENR has developed a capable management team and has had demonstrable success in instituting its structural reorganization and in decentralization of decision-making. The effects of recent budget cuts and paring of management positions is, at present, undetermined. It should be noted, however, that these changes have been mostly at the top of the management structure and, theoretically, should not be visible at the staff level of the organization.

In terms of the EMB, authority to act on behalf of the Bureau has been placed with the Director and Assistant Director. In practice, management at DENR has been a collaborative and consensual matter. Most strategic decisions are based on consensus. Thus, the Director of EMB can be expected to have discussed major decisions with departmental management (at a minimum, at the Assistant Secretary level) prior to implementation of the decision. In terms of project management, much of the above will remain true, i.e., decisions would be made after consultation with management if time permits.

Management of the IEMP project activities will be vested in a full-time project coordinator within the structure of EMB. This project coordinator will be supported by the professional, technical, and support staff resources of EMB. Policy considerations and other guidance as may be necessary would be provided by the project management unit established for IEMP. Additional resources available to the project coordinator include those represented by the membership of the working groups and the DENR and DTI regional office staffs.

DENR has demonstrated its ability to provide competent managers on previous donor-assisted projects; it is fully expected that they will be able to do so

for this project. The availability of staff (particularly professional and technical) from EMB is not as clear, as the subject area is not one in which there has been extensive prior experience. While the number of EMB staff devoted to toxic and hazardous waste management are very few, there are sufficient numbers of professional and technical personnel who have been trained and have experience in directly related areas. With few exceptions, the same is not true at the regional office level, where there are considerably fewer personnel with directly related training and experience.

Thus, one of the objectives of the project is to increase the capabilities of EMB to sustain projects such as IEMP with existing staff resources. This objective will be met through the provision of training. Perhaps more problematic to IEMP may be the level of the work load of the EMB staff as it relates to the availability of staff to provide support to the project. Increasing decentralization of decision-making to the regional offices should, however, ease this situation (particularly with regard to EIA review, which consumes a great deal of staff resources within EMB and which is being devolved to the regional offices). Thus, there appear to be sufficient staff resources to manage the project.

It should be recognized that EMB has accomplished a great deal with respect to its legislative mandate, particularly in light of the resource constraints under which it operates.

C. OTHER ORGANIZATIONS

Among the other organization and entities that will be involved in the IEMP Project are the Department of Trade and Industry (DTI), industry chambers of commerce and trade associations, individual firms, and non-governmental organizations (including professional associations). In addition, there are likely to be additional groups that will be identified during the course of the project as having either a participatory role or as being potential beneficiaries; these groups will be included as appropriate. The primary institutional vehicle for inclusion of various groups is anticipated to be through the project's working groups.

DTI will participate in project management. Generally supportive of Philippine industry, DTI involvement in the project will facilitate industry participation. DTI also serves a regulatory role within the government as it is charged with the licensing of firms through the Board of Investments, which determines the areas suitable or requiring investment. As a part of its approval process, the BOI requires applicants to have obtained an Environmental Compliance Certificate (ECC) prior to BOI approval of projects. The ECC, a permit mechanism administered by DENR, requires that an Environmental Impact Assessment be completed and that the EIA be approved by EMB. As a part of its normal responsibilities, DTI maintains a staff with expertise in most of the industries represented in the Philippines.

Serving as advocates of the industries that they represent are the Philippine Chamber of Commerce and Industry, the Chambers representing the industries of various nationalities (i.e., the American Chamber of Commerce, the European Chamber, etc.) and the industry-specific trade associations. While the broader membership Philippine Chamber of Commerce and Industry and the

American Chamber of Commerce have established committees to address the environmental concerns of their members, most of the smaller, specialized trade associations have not done so. It is proposed that the initial contact with many of the firms to be approached regarding participation in the PMAs will be made through these groups. While the project will not draw upon whatever technical resources that these organizations may possess (except as agreed upon), their participation will facilitate access to those of their members that may wish to participate.

Essential to the success of the IEMP Project will be the participation of industrial firms on a voluntary basis in the Pollution Management Appraisals. These activities, performed largely to benefit the participants by identifying measures to reduce their levels of pollution, are a cornerstone to the project concept. As described above, it is anticipated that the initial contact with firms possibly interested in participation would be made through the various chambers and trade associations to which they belong. Other avenues for identifying firms would be through civic organizations (i.e., Rotary Clubs, etc), business oriented NGOs, and through various civic leaders. It must be stressed, however, that participation is intended to be voluntary.

D. CONCLUSIONS

The GOP management structure for IEMP will build upon the institutional capabilities that are currently being employed. This management structure will facilitate continuity in policy formulation and serve to strengthen DENR, DTI, and EMB capabilities to sustain activities initiated under the project. The staff resources at EMB appear to be sufficient in number to support IEMP, notwithstanding shortages of personnel specifically trained in some of the disciplines appropriate to industrial environmental management. The lack of access to analytical laboratories to assess the chemical properties of pollutants may require project support to resolve in the short-term. The project will examine long-term solutions to the shortages of facilities and equipment.

There are relatively few professional and technical personnel external to EMB with training and experience in environmental management. The Pollution Control Association of the Philippines, Inc. has approximately 300 corporate and professional members. There are, however, a large number of persons who have training and/or experience in disciplines that are related to those appropriate to industrial environmental management. The project, to some extent, envisions the provision of training to those persons to strengthen the depth of human resources. Also of concern are the level of expertise present in DENR's regional environmental management units and the lack of trained personnel available at the local government level (this latter shortage will be exacerbated with the passage of the Local Government Code with its requirement that each LGU have an Environmental Officer). Again, the provision of training under the IEMP Project will assist in correcting some of these deficiencies.

ANNEX L

SELECTION OF INDUSTRIES AND GEOGRAPHIC LOCATIONS FOR INITIAL POLLUTION MANAGEMENT APPRAISALS

ANNEX L: SELECTION OF INDUSTRIES AND GEOGRAPHIC LOCATIONS FOR INITIAL POLLUTION MANAGEMENT APPRAISALS

A. Introduction

The Industrial Environmental Management Project (IEMP) proposes to help industries conduct Pollution Management Appraisals (PMAs). These appraisals are designed to help industry find ways to improve efficiency while minimizin the amount of waste generated and reducing the amount of pollution in the environment.

IEMP will identify several industries that can be targeted for PMAs in the early stages of implementation. One of IEMP's objectives is to quickly produce success stories with respect to benefits to both the plant's operations and to the environment as a result of implementing recommendations of PMAs. Later in the project, expressions of industry interest in participation and the outcome of the Environmental Risk Assessments will determine which industries will undergo PMAs.

Initially, the following criteria in descending order of importance were used for selecting the most likely industries for further consideration and analysis.

- -- High probability of success with positive benefit to industry.
- -- Industries on Environmental Management Bureau (EMB) list of major polluters ("dirty dozen").
- -- Wastes of known characterization, therefore little new data needed.
- -- Low technology requirements; therefore, good opportunity to train with focus on PMA technique (rather than specialized technical skills).
- -- USAID experience working with the industry.

Using this initial set of criteria, the agro-industry sector rated quite highly because:

- -- The sector meets all criteria.
- -- Four of the top six industry types on the EMB "Dirty Dozen List" nationwide were from the agro-industry sector; and
- -- Proven schemes in waste reduction with positive financial return to industry have been demonstrated in a few cases in the Philippines.

It was recognized, however, that there were other industrial sectors in the Philippines whose wastes were much more hazardous (toxic) and for which

solutions that would directly benefit industry would not be as easily identified.

Subsequently, a broader set of criteria was developed to help evaluate the selection of priority industries for the initial round of Pollution Management Appraisals. This paper presents a multi-criteria analysis for the selection of the type of industries and respective geographic locations to be offered the opportunity to participate during the first phase of the project. The recommendation will be based on the weighted scoring of various criteria for each industry. Most of the industries were selected from DENR's Classification of Philippine Industries (Table 1).

B. Selection Criteria

The criteria for selecting industries for the initial set of Pollution Management Appraisals and the parameter ranking values assigned to them are as follows:

-- Potential financial benefits, taking into account the rate of return for the pollution control capital investments. The parameter values were defined as follows:

Small return	1
Medium return	2
Large return	3

-- Potential social benefits, based on better working conditions within the industry and likely improvement of local and regional quality of life. The parameter values were defined as follows:

No impact	0
Within the plant	1
Local	2
Regional	3

-- Pollution reduction potential, using techniques such as source reduction, by-product exchange, and feedstock substitution. The improvement of the industrial process and production of saleable by-products are essential steps for reduction of waste. The parameters were assigned on a scale of 1 through 10, with 10 representing the highest potential. These values were assigned based on the project design team's experience on other studies.

-- Improvements in health conditions, using the same values as those assigned for the social benefits.

-- Improvement in environmental conditions. The assigned values are based on the expectations of the improvement within the area affected by the pollution from the plant. The values were defined as follows:

Within the plant	1
Local	2
Regional	3

-- Size of the industry. Because larger industrial plants are expected to have better access to capital needed for plant improvements and for investments in pollution control technology and equipment, the project places greater preference toward providing assistance to small and medium-sized plants. Large plants, however, will not be denied participation in the project. The coefficients for the size of the industries, therefore, were assigned as follows:

Large	1
Medium	2
Small	3

-- Included in the government list as high profile pollutant producers (the "Dirty Dozen List"). The Environmental Management Bureau (EMB) recently requested all regional offices of the Department Environmental of Natural resources (DENR) to prepare a list of the 12 worst polluters in the region. The resulting survey has been labelled the "Dirty Dozen List" (Table 2). Those included in the list were given a value of 1; those not included in the list were given a value of 0.

-- Ease of implementing practical pollution reduction measures. The criterion identified the technical difficulties to implement the reduction of waste or to improve the industrial operation. Two values were given for the parameters: 1 for those easy to implement, and 0 for those that are difficult to implement.

Table 3 summarizes the values assigned to industries as classified by DENR (Table 1). Table 3 also includes a few industry types that the project design team considered. Selection of the values was based in part on the findings of the following brief survey of some of the industries that were of particular interest for the first round of PMAs.

C. Brief Industrial Survey

1. Sugar Milling and Refining

Sugar milling and refining is concentrated in the Visayas (Negros) and Luzon. Effluents from sugar mills are highly pollutive, with BOD and suspended solid concentrations of 2000 to 2500 mg/l. None of the local sugar mills have any effective treatment plants. The liquid waste is generally discharged into adjacent rivers or creeks, destroying downstream aquatic life in the waterways.

It is unlikely that wastewater treatment from sugar mills will produce any saleable by-product. However in-house reduction and possible recycling of cooling water are worthy of investigation. Cleanup of the sugar mill's

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wastewater should improve downstream water quality, thereby improving fishing activities and healthier environment for the people living downstream along the river.

2. Distilleries/Blending Spirits

Most of the distilling plants are located in Manila and Canlubang (La Tondeña). Nearly all of the plants have some sort of on-site wastewater treatment step.

Distilleries are located in the same general area as sugar mills. None of the distilleries have wastewater treatment. The wastewater from distilleries, mainly slops from the fermentation tanks, is high in BOD (in the range of 40,000 to 50,000 mg/l) and suspended solids.

Because of the high levels of BOD and suspended solids, standard wastewater treatment technologies such as the activated sludge process will not work for this industry. In Bacolod (Negros), one alcohol distiller, Asian Alcohol, is negotiating with BIOTIM, a Belgian firm, to install digesters to treat its wastewater.

3. Breweries

There are many breweries. The San Miguel Corporation operates breweries in Manila, San Fernando, Cebu, and Bacolod. Asia Brewery is located in Laguna and is building a second brewery in Mindanao. All these breweries have existing wastewater treatment facilities, which in the case of San Miguel, produces effluent that complies with regulatory standards. Asia Breweries' treatment plant in Laguna is operated only infrequently. Brewery wastewater is typically high in BOD and suspended solids (1,500 - 2000 mg/l) and is generally treated by the activated sludge method, which requires a high level of power to operate. The sludge, once separated from the wastewater and dried, can be used as feed for cattle, which is done in the case of San Miguel, which has its own cattle fattening farm.

4. Textile Mills

The Philippine textile industry is concentrated in and around Manila. Some of the mills have primitive wastewater treatment plants employing a physical/chemical method to reduce BOD. None of the mills remove color from the waste. Treatment of textile mill waste (with levels of BOD from 600 to 800 mg/l) will not produce any saleable by-product.

5. Desiccated Coconut Factories

These factories are mainly located in Mindanao and Batangas. The wastewater generated by the industry is high in BOD and suspended solids. Coconut water represents the bulk of the wastewater. Some coconut water is used to produce vinegar (with acid less than 4.5%) and glycerine. It has been proven that coconut water is beneficial in the treatment of stomach and kidney disorders as it contains iron and magnesium. Some countries in Europe are interested in buying coconut water in bulk (in vacuum sealed drums) or powder form.

6. Cocoa Beans

Cocoa beans have been planted and harvested in Batangas, Cavite, Northern Luzon, and Mindanao for more than 20 years. Most of the harvest is used by local manufacturers of chocolate. Cocoa butter is exported. The hard shell of the cocoa bean is normally considered waste. Since the shell has a fairly high content of protein and fat, it could be pulverized and used as an additive for animal feed.

7. Fish Industry/Canneries

The Philippine fish cannery industry, with the exception of MarFishing, operates with production machinery dating from the 1960s. As a result, fish waste is not converted into by-products (cat food, fishmeal or oil). Because of the outdated production techniques, a great quantity of water is used in both production and cleaning operations. A potential exists for a group of canneries to work cooperatively to process waste into cat food or fish meal, thereby reducing the pollution load on the receiving streams.

8. Piggeries

There are large piggeries in the country, some with their own feedmills. Around 40 percent of the hog population is in Mindanao, with the remainder of the larger piggeries located in various provinces around Manila. The wastewater generated by piggeries includes the excrement and urine from the hogs, combined with floor washwater. All of the washwater is collected in trenches which empty into holding ponds. The overflow from the holding ponds normally flows, without any further treatment, into nearby surface water. The waste generated by the piggery feedlot can be digested. The gas released from the digestion process can be used for heating of the oil in the banana chip production, power production, or for other uses.

9. Banana Chips

Banana chip manufacturers are located in Laguna and Mindanao. Waste material generated by this process are the banana peels, rejects, and rejected chips from the frying steps. This waste material can be cut and used as animal feed. In addition, wastes from piggeries (as described above) can be used to generate process heat for the banana chip industry. Although small, this industry has a very good growth potential.

10. Cashew Nuts

The processing of cashew nuts is based on techniques employed in Africa (Tanzania). Shells are heated and then cracked open. When heated, the nuts release a very corrosive and toxic gas. This primitive method of cashew nut cracking can be improved by employing machines which do not release the gas or acid to the atmosphere. The acid waste once separated from the shell and nut, can have a use in industry. Because of the difficulty in handling the product during the cracking process, only around 40 percent of the total available harvest is processed.

11. Vegetable and Coconut Oil

Copra, with 85 percent production destined for the world market, is a major export commodity. There are presently around 52 crude oil and refined vegetable oil plants operating in the Philippines. Except for the skimming off of any floating oil, which is returned to the process, no other wastewater treatment is provided by these mills. Average BOD in plant effluent is around 400 to 500 mg/l. Advanced wastewater treatment, such as acidulation will free more of the oil contained in the wastewater for recovery.

12. Tanneries

The tanneries are located in the Bulacan area. The tanneries are typically small family operations. The wastewater discharged from these factories contains a high level of BOD in the range of 20,000 to 30,000 mg/l. The wastewater flows untreated into the receiving streams.

13. Pulp, Paperboard, and Paper

Pulp mills in the Philippines have chemical recovery systems integrated into the process line. After the valuable chemicals have been recovered, wastewater from pulp is either stored in lagoons or is discharged untreated to surface waters. Mills are located in and around Manila and Mindanao.

14. Soaps and Detergents

The larger soaps and detergents manufacturers are nearly all located in Manila. All have some sort of wastewater treatment system, including in most cases, a clarification step.

15. Cement

The cement industry is basically a wet/dry process. Air pollution is the major pollution problem of this industry. Electrostatic precipitators are expensive to install and operate and hardly affordable to an industry which must sell its product at a set price. Water pollution from a cement plant is negligible. The cement industry is a fuel intensive industry. Changes in production techniques may result in significant fuel savings. Cement kilns may also be used to burn waste solvents or other waste material that have a high BTU value.

16. Iron and Steel

The major steel producer in the country, National Steel Corporation, located in Iligan City, is presently completing the construction of a fairly advanced wastewater treatment plant. Other steel operations include the production of reinforcing bars and other products from scrap. The industry is a significant polluter resulting from their smelting operations.

17. Semiconductors

There are around 22 semiconductor plants in the Philippines. Two are located in Baguio and Cebu; the rest are located in Metro Manila along the shores of Laguna de Bay and the bordering municipalities of Taguig, Bicutan, and Paranaque. The larger firms are multinational; some of the smaller locally owned firms are subcontractors to the multinationals. To a large degree, pollution control programs for the local multinationals are dictated by their home office. Basic wastewater treatment facilities have been installed at all of the multinational semiconductor firms. The typical wastewater treatment plant includes flow equalization, neutralization, chemical addition, clarification, and sludge dewatering. The effluent, with significantly reduced levels of heavy metals, is discharged into a receiving stream.

The wastewater treatment plant sludge containing the added chemicals and heavy metals, is dewatered in filter presses and stored. Disposal of this hazardous waste presents a problem to the industry. In the past, contractors, for a fee, removed the stored sludge from the factory premises for disposal elsewhere. Since there is no controlled landfill operation in Manila, it is not known where the sludge is ultimately disposed of.

In the past, a local company bought the sludge from some semiconductor firms for export to Japan, where the sludge was incinerated, reportedly to recover the heavy metals. It is now our understanding that this company has ceased to operate because of air pollution problems.

Appropriate treatment/disposal of wastewater treatment plant sludge is likely to remain a significant issue for the semiconductor industry. Studies of recycling and/or disposal alternatives should be conducted.

The semiconductor companies in Metro Manila are nearly all located in areas not properly serviced by the Metropolitan Water and Sewage System (MWSS). Water distribution pipelines have been installed along the South Superhighway; however, water is not available in sufficient quantities for industrial use. Nearly all companies in these areas either operate their own deep wells or truck water in for daily use from Calamba or Laguna. Overpumping of the groundwater aquifers in the area where most of the factories are located has resulted in an overall lowering of the water table down to 250 m, and saltwater intrusion from Manila Bay.

A semiconductor firm with a typical cleaning and plating operation in Paranaque must truck in 900 cubic meters of water per week at a cost of ₱40,500. As a firm's deepwells become unproductive, recycling becomes attractive. A typical semiconductor firm will employ around 1,500 people. The quantity of domestic wastewater produced at a typical plant will range from 25,000 to 30,000 gallons/day (94-113 cubic meters/day). At the present time, the domestic wastewater is collected in septic tanks. In most cases, these septic tanks are very much undersized, so that treatment is inefficient. This results in continuous pollution overflow, which finds its way into Laguna de Bay.

Rather than discharging the domestic wastewater into septic tanks, wastewater could be treated at relatively low cost in a small biologically activated sludge plant with a tertiary filtration step added, so that after chlorination, the effluent can be recycled into the factory for non-potable operations (such as flushing of toilets). One typical package treatment plant on the market today will produce a disinfected effluent with very low (1-2 mg/l) levels of BOD and suspended solids. Assuming that approximately 60 percent of the domestic effluent is recycled, approximately 70 cubic meters of treated water will be available for reuse.

Power requirements for a small package plant would be around 2.5 kw/hr (for operating an air blower and lift pump intermittently). Annual operation and maintenance costs would be less than P 90,000. Capital costs, including installation, would be around P 1,000,000 to 1,300,000. Therefore, payback will be about 1 year, making the recycling project highly feasible, since it also eliminates one source of pollution from that industry.

Fumes generated in the dipping and tinning section of the semiconductor process are presently collected by fume hoods and exhausted through a wet scrubber to the atmosphere. The scrubber water is neutralized in the wastewater treatment plant's equalization tank.

Semiconductor plants typically use chlorinated solvents (such as tetrachloroethylene) or freon for degreasing operations. At present, these solvents are collected in drums and stored indefinitely. In the US and elsewhere, these solvents are frequently redistilled for subsequent reuse on-site. Redistillation can significantly reduce the amount of virgin solvents that must be purchased. Where facilities do not use sufficient quantities of solvents to justify on-site redistillation, it may be possible for a vendor to collect solvents from several small plants and recycle these solvents in a commercial solvent recycling plant.

Air emissions from solvent degreasing units can also be a significant environmental concern. In the Philippines, volatile emissions from degreasing operations are often collected in fume hoods to reduce exposure to workers. These emissions, however, are vented directly into the atmosphere. It is possible for the emissions to be collected via carbon adsorption. Solvents can then be removed from the carbon, which can then be reused. This operation significantly reduces volatile emissions to the atmosphere.

D. Identification of Highest Ranked Industries

1. Ranking Analysis

The values indicated in Table 3 are based on the parameter ranking (Selection Criteria) described earlier in this report. The values were then summed to develop a total score for each criteria. Each value was in turn converted (Table 4) to the percentage of the total score noted at the bottom of each column in Table 3. The percentage were then totalled for each individual industry. The industry with the highest scores were ranked highest priority (Table 4).

2. Sensitivity Analysis

Since the ranking system is subjective, a sensitivity analysis was conducted. A coefficient of impact was created. In Table 4, which was the initial ranking analysis, each selection criterion was given equal weight. The approach to the sensitivity analysis was to modify the relative importance of some of the selection criteria, for example, by doubling the coefficient of impact. The sensitivity analysis provide an indication of the importance of such criteria as social benefits, health and environment, and being on the government's list of major polluters ("Dirty Dozen List").

Two analyses were made. In Analysis 1 (Table 5a), the parameters for social benefits and health and environmental improvement were doubled in value. For Analysis 2 (Table 5b), the parameters for social benefits, health and environmental improvement, and appearance on the EMB list (DD in the table) were doubled in value.

The five highest ranked industries for each analysis are indicated in Table 6.

3. Geographic Location

The industries ranked highest are the recommended candidate industries to be studied in the early phases of the project. These industries have strong presence in the area of General Santos and Bulacan.

Several visits were made by the technical team in the areas of General Santos and Laguna de Bay. Both are good candidates for the initial round of PMAs. Facilities near Metro Manila are easily reached from Manila. General Santos, however, offers a good opportunity for successful evaluation and implementation of the recommended findings by the PMAs for the following reasons:

-- The major industries include piggery operations (estimated 240,000 pigs) and fish canning (presently 3 processing plants, 2 scheduled to open soon).

-- The city has shown serious concern for the environmental quality of life in the area.

-- USAID has long-term investment programs in the area.

Table 1
Classification of Philippine Industries

Industry	Industry Code
Highly Pollutive (Extremely Hazardous)	
Basic industrial chemical except fertilizer	3511
Chemical products not elsewhere specified	3529
Petroleum refineries	3530
Miscellaneous products of petroleum and coal	3540
Highly Pollutive (Hazardous)	
Sugar milling	3118
Distilling, rectifying and bending spirits	3131
Wine industries	3132
Malt liquor and malt	3133
Spinning, weaving and finishing textiles	3211
Tanneries and leather finishing	3231
Leather products except footwear	3233
Pulp, paperboard and paper	3411
Pulp, paperboard and paper, not elsewhere specified	3419
Soaps, cleansing preparations, toiletries	3523
Cements, lime and plaster	3692
Iron and steel	3710
Non-ferrous basic metals	3720
Highly Pollutive (Non-Hazardous)	
Meat Slaughter, preparation	3111
Dairy products	3112
Fruit, vegetable preparation	3113
Paints, varnishes preparation	3114
Vegetables, animal oils and fates	3115
Pollutive (Extremely Hazardous)	
Fertilizer and pesticides	3512
Synthetic resins, plastic materials	3513
Paints, varnishes and lacquers	3521
Tires and tubes	3551
Rubber products, not elsewhere specified	3559

Source: Environmental Impact Assessment Handbook, 1983
National Environmental Protection Council

DIRTY DOZEN LIST

Table 2 GOP List of Major Polluters by Region and Industry Type

	Regions												
	CAR	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Total
Highly Pollutive - Extremely Hazardous														
Basic industry chemicals except fertilizer									1		1		1	3
Petroleum refineries				1										1
Misc. products of petroleum and coal			1		1			1	1		3			7
Power plants				1	1	3								5
Highly Pollutive - Hazardous														
Sugar milling and refining			1	2		1	7	2			1	1		15
Distilling, rectifying and malt products				2			1							3
wine and malt liquor								1	1					2
Spinning, weaving and finishing textile														
Tanneries and leather finishing														
Leather products except footware														
Pulp paperboard and paper						1						1		2
Soaps, cleaning materials, detergents, toiletries														
Cement, lime and plasters		3		2		1		1			2	1	2	12
Iron and steel				2				1						3
Non-ferrous metals						1			2					3
Mining industry		7		1	1	3	1	1	1			2		17

Table 2 GOP List of Major Polluters by Region and Industry Type

	Regions												
	CAR	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Total
Highly Polutive - Non Hazardous														
Meat slaughter			1								1	1		3
Dairy products					3					1			1	5
Fruit, vegetables, preparation		1												1
Fish, crustacean preparation										2				2
Vegetables, animal oil and fats														
Piggery and poultry farms	1	2	3		3	1	1	2				1	1	15
Food products		2				2	1	5	2	1		2		15
Soft drinks		4	1			2				1	1	2		11
Pollutive - Extremely Hazardous														
Fertilizer and pesticides								1	1					2
Synthetic resins, plastics														
Paints, varnishes and lacquers														
Tires and tubes													1	1
Rubber products, not elsewhere specify										1		1	2	4
Highly Pollutive - Non Hazardous														
Rice mills			1				3			2				6
Lumber products			7							1	1			9
Furniture shops			1											1

Table 3 - Industrial Parameters

Industry	Potential Benefits			Improvements		Industry Size	Included in DD	Easy to Implem't
	Financial	Social	Byproducts	Health	Environmt			
Basic industry chemicals except for fertilizer	2	3	3	3	3	1	1	0
Petroleum refineries	1	2	2	2	2	1	0	0
Sugar milling and refining	2	3	3	3	3	1	1	0
Distilling of alcohol	2	2	7	3	3	2	1	0
Blending spirits	1	2	2	1	2	2	0	1
Breweries	2	3	6	2	2	1	0	1
Textile, spinning, dying and weaving	1	3	0	2	2	1	1	0
Tanneries, leather finishing	1	3	0	2	2	2	1	0
Leather products except footware	1	1	0	2	1	2	1	1
Pulp and paper	1	3	0	2	1	2	1	0
Soaps, cleaning materials, detergents, toiletries	1	2	2	2	2	1	1	0
Cement and lime	1	3	0	3	3	1	1	0
Iron and steel	1	2	2	3	2	1	1	1
Non-ferrous metals	1	3	0	3	3	1	1	0
Slaughter houses	1	2	4	2	2	2	1	0
Meat packing	1	2	2	2	2	2	0	1
Dairy products	1	2	2	2	2	2	1	1
Piggery	3	3	10	3	3	2	1	1
Fish canning	3	3	8	3	3	2	1	0
Fruits, vegetable preparation	2	2	4	2	2	2	1	0

Table 3 - Industrial Parameters -2

Industry	Potential Benefits		Byproducts	Improvements		Industry Size	Included in DD	Easy to Implem't
	Financial	Social		Health	Environmt			
Fertilizer and pesticides	1	3	0	2	3	3	1	0
Synthetic resins, plastics	1	1	0	1	2	2	0	0
Paints, varnish and lacquers	1	2	2	1	2	2	1	0
Tires and tubes	1	2	0	0	1	2	1	0
Rubber products-general	1	2	0	0	1	2	1	0
Dessicated coconuts	2	3	7	1	2	1	1	0
Coconut and vegetable oil	2	2	3	1	2	1	0	0
Pharmaceuticals	1	3	0	3	3	1	1	0
Semiconductors	1	3	3	3	3	1	1	1
Mining	1	3	2	3	3	1	1	0
Furniture	2	1	5	1	1	2	0	1
Automotive and metal finishing	1	1	2	1	1	1	0	1
	44	75	81	64	69	50	24	10

Table 4 - Ranking of Industries

Industry	Potential Benefits		Improvements			Ind'try Size	Included in D.D	Easy to Implement	Total
	Financial	Social	Byproducts	Health	Environmt				
Basic industry chemicals except for fertilizer	4.55	4.00	3.70	4.69	4.35	2.00	4.17	0.00	27.45
Petroleum refineries	2.27	2.67	2.47	3.13	2.90	2.00	0.00	0.00	15.43
Sugar milling and refining	4.55	4.00	3.70	4.69	4.35	2.00	4.17	0.00	27.45
Distilling of alcohol	4.55	2.67	8.64	4.69	4.35	4.00	4.17	0.00	33.06
Blending spirits	2.27	4.00	2.47	1.56	2.90	4.00	0.00	10.00	27.20
Breweries	4.55	4.00	7.41	3.13	2.90	2.00	0.00	10.00	33.98
Textile, spinning, dying and weaving	2.27	4.00	0.00	3.13	2.90	2.00	4.17	0.00	18.46
Tanneries, leather finishing	2.27	4.00	0.00	3.13	2.90	4.00	4.17	0.00	20.46
Leather products except footware	2.27	1.33	0.00	3.13	1.45	4.00	4.17	10.00	26.35
Pulp and paper	2.27	4.00	2.47	3.13	2.90	2.00	4.17	0.00	20.93
Soaps, cleaning materials, detergents, toiletries	2.27	2.67	2.47	3.13	2.90	2.00	4.17	0.00	19.60
Cement and lime	2.27	4.00	0.00	4.69	4.35	2.00	4.17	0.00	21.47
Iron and steel	2.27	2.67	2.47	4.69	2.90	2.00	4.17	10.00	31.16
Non-ferrous metals	2.27	4.00	0.00	4.69	4.35	2.00	4.17	0.00	21.47
Slaughter houses	2.27	2.67	4.94	3.13	2.90	4.00	4.17	0.00	24.07
Meat packing	2.27	2.67	4.94	3.13	2.90	4.00	0.00	10.00	29.90
Dairy products	2.27	2.67	2.47	3.13	2.90	4.00	4.17	10.00	31.60
Piggeries	6.82	4.00	12.35	4.69	4.35	4.00	4.17	0.00	40.37
Fish canning	6.82	4.00	9.88	4.69	4.35	4.00	4.17	0.00	37.90
Fruits, vegetable preparation	4.55	2.67	4.94	3.13	2.90	4.00	4.17	0.00	26.34

Table 4 - Ranking of Industries -2

Industry	Potential Benefits		Byproducts	Improvements		Ind'try Size	Included in D.D	Easy to Implement	Total
	Financial	Social		Health	Environmt				
Fertilizer and pesticides	2.27	4.00	0.00	3.13	4.35	6.00	4.17	0.00	23.91
Synthetic resins, plastics	2.27	1.33	0.00	1.56	2.90	4.00	0.00	0.00	12.07
Paints, varnishes and lacquers	2.27	2.67	2.47	1.56	2.90	4.00	4.17	0.00	20.04
Tires and tubes	2.27	2.67	0.00	0.00	1.45	4.00	4.17	0.00	14.56
Rubber products, general	2.27	2.67	0.00	0.00	1.45	4.00	4.17	0.00	14.56
Dessicated coconuts	4.55	4.00	8.64	1.56	2.90	2.00	4.17	0.00	27.82
Coconut and vegetable oil	4.55	2.67	3.70	1.56	2.90	2.00	0.00	0.00	17.38
Pharmaceuticals	2.27	4.00	0.00	4.69	4.35	2.00	4.17	10.00	31.47
Semiconductors	2.27	4.00	3.70	4.69	4.35	2.00	4.17	10.00	35.18
Mining	2.27	4.00	2.47	4.69	4.35	2.00	4.17	0.00	23.94
Furniture	4.55	1.33	6.17	1.56	1.45	4.00	0.00	10.00	29.06
Automotive and Metal finishing	0.00	1.33	2.47	1.56	1.45	2.00	0.00	10.00	18.81
Total Parameters	44	75	81.	64	69	50	24	10	
Coefficient of Impact	1	1	1	1	1	1	1	1	

Table 5a – Sensitivity Analysis $

Industry	Potential Benefits		Byproducts	Improvements		Ind'try Size	Included in D.D	Easy to Implement	Total
	Financial	Social		Health	Environmt				
Basic industry chemicals except for fertilizer	4.55	8.00	3.70	9.38	8.70	2.00	4.17	0.00	40.49
Petroleum refineries	2.27	5.33	2.47	6.25	5.80	2.00	0.00	0.00	24.12
Sugar milling and refining	4.55	8.00	3.70	9.38	8.70	2.00	4.17	0.00	40.49
Distilling of alcohol	4.55	5.33	8.64	9.38	8.70	4.00	4.17	0.00	44.76
Blending spirits	2.27	8.00	2.47	3.13	5.80	4.00	0.00	10.00	35.66
Breweries	4.55	8.00	7.41	6.25	5.80	2.00	0.00	10.00	44.00
Textile, spinning, dying and weaving	2.27	8.00	0.00	6.25	5.80	2.00	4.17	0.00	28.49
Tanneries, leather finishing	2.27	8.00	0.00	6.25	5.80	4.00	4.17	0.00	30.49
Leather products except footware	2.27	2.67	0.00	6.25	2.90	4.00	4.17	10.00	32.25
Pulp and paper	2.27	8.00	2.47	6.25	5.80	2.00	4.17	0.00	30.96
Soaps, cleaning materials, detergents, toiletries	2.27	5.33	2.47	6.25	5.80	2.00	4.17	0.00	28.29
Cement and lime	2.27	8.00	0.00	9.38	8.70	2.00	4.17	0.00	34.51
Iron and steel	2.27	5.33	2.47	9.38	5.80	2.00	4.17	10.00	41.41
Non-ferrous metals	2.27	8.00	0.00	9.38	8.70	2.00	4.17	0.00	34.51
Slaughter houses	2.27	5.33	4.94	6.25	5.80	4.00	4.17	0.00	32.76
Meat packing	2.27	5.33	4.94	6.25	5.80	4.00	0.00	10.00	38.59
Dairy products	2.27	5.33	2.47	6.25	5.80	4.00	4.17	10.00	40.29
Piggeries	6.82	8.00	12.35	9.38	8.70	4.00	4.17	0.00	53.40
Fish canning	6.82	8.00	9.88	9.38	8.70	4.00	4.17	0.00	50.93
Fruits, vegetable preparation	4.55	5.33	4.94	6.25	5.80	4.00	4.17	0.00	35.03

Table 5a - Sensitivity Analysis* -2

Industry	Potential Benefits		Byproducts	Improvements		Ind'try Size	Included in D.D	Easy to Implement	Total
	Financial	Social		Health	Environmt				
Fertilizer and pesticides	2.27	8.00	0.00	6.25	8.70	6.00	4.17	0.00	35.39
Synthetic resins plastics	2.27	2.67	0.00	3.13	5.80	4.00	0.00	0.00	17.86
Paints, varnishes and lacquers	2.27	5.33	2.47	3.13	5.80	4.00	4.17	0.00	27.16
Tires and tubes	2.27	5.33	0.00	0.00	2.90	4.00	4.17	0.00	18.67
Rubber products, general	2.27	5.33	0.00	0.00	2.90	4.00	4.17	0.00	18.67
Dessicated coconuts	4.55	8.00	8.64	3.13	5.80	2.00	4.17	0.00	36.28
Coconut and vegetable oil	4.55	5.33	3.70	3.13	5.80	2.00	0.00	0.00	24.50
Pharmaceuticals	2.27	8.00	0.00	9.38	8.70	2.00	4.17	10.00	44.51
Semiconductors	2.27	8.00	3.70	9.38	8.70	2.00	4.17	10.00	48.21
Mining	2.27	8.00	2.47	9.38	8.70	2.00	4.17	0.00	36.98
Furniture	4.55	2.67	6.17	3.13	2.90	4.00	0.00	10.00	33.41
Automotive and Metal finishing	0.00	2.67	2.47	3.13	2.90	2.00	0.00	10.00	23.16
Total Parameters	44	75	81	64	69	50	24	10	
Coefficient of Impact	1	2	1	2	2	1	1	1	

* Stressed impact on social benefits, and health and environmental improvements

Table 5b - Sensitivity Analysis *

Industry	Potential Benefits			Improvements		Ind'try Size	Included in D.D	Easy to Implement	Total
	Financial	Social	Byproducts	Health	Environmt				
Basic industry chemicals except for fertilizer	4.55	8.00	3.70	9.38	8.70	2.00	8.33	0.00	44.65
Petroleum refineries	2.27	5.33	2.47	6.25	5.80	2.00	0.00	0.00	24.12
Sugar milling and refining	4.55	8.00	3.70	9.38	8.70	2.00	8.33	0.00	44.65
Distilling of alcohol	4.55	5.33	8.64	9.38	8.70	4.00	8.33	0.00	48.92
Blending spirits	2.27	8.00	2.47	3.13	5.80	4.00	0.00	10.00	35.66
Breweries	4.55	8.00	7.41	6.25	5.80	2.00	0.00	10.00	44.00
Textile, spinning, dying and weaving	2.27	8.00	0.00	6.25	5.80	2.00	8.33	0.00	32.65
Tanneries, leather finishing	2.27	8.00	0.00	6.25	5.80	4.00	8.33	0.00	34.65
Leather products except footware	2.27	2.67	0.00	6.25	2.90	4.00	8.33	10.00	36.42
Pulp and paper	2.27	8.00	2.47	6.25	5.80	2.00	8.33	0.00	35.12
Soaps, cleaning materials, detergents, toiletries	2.27	5.33	2.47	6.25	5.80	2.00	8.33	0.00	32.46
Cement and lime	2.27	8.00	0.00	9.38	8.70	2.00	8.33	0.00	38.68
Iron and steel	2.27	5.33	2.47	9.38	5.80	2.00	8.33	10.00	45.58
Non-ferrous metals	2.27	8.00	0.00	9.38	8.70	2.00	8.33	0.00	38.68
Slaughter houses	2.27	5.33	4.94	6.25	5.80	4.00	8.33	0.00	36.92
Meat packing	2.27	5.33	4.94	6.25	5.80	4.00	0.00	10.00	38.59
Dairy products	2.27	5.33	2.47	6.25	5.80	4.00	8.33	10.00	44.46
Piggeries	6.82	8.00	12.35	9.38	8.70	4.00	8.33	0.00	57.57
Fish canning	6.82	8.00	9.88	9.38	8.70	4.00	8.33	0.00	55.10
Fruits, vegetable preparation	4.55	5.33	4.94	6.25	5.80	4.00	8.33	0.00	39.20

Table 5b - Sensitivity Analysis* -2

Industry	Potential Benefits		Byprbducts	Improvements		Ind'try Size	Included in D.D	Easy to Implement	Total
	Financial	Social		Health	Environmt				
Fertilizer and pesticides	2.27	8.00	0.00	6.25	8.70	6.00	8.33	0.00	39.55
Synthetic resins, plastics	2.27	2.67	0.00	3.13	5.80	4.00	0.00	0.00	17.86
Paints, varnishes and lacquers	2.27	5.33	2.47	3.13	5.80	4.00	8.33	0.00	31.33
Tires and tubes	2.27	5.33	0.00	0.00	2.90	4.00	8.33	0.00	22.84
Rubber products, general	2.27	5.33	0.00	0.00	2.90	4.00	8.33	0.00	22.84
Dessicated coconuts	4.55	8.00	8.64	3.13	5.80	2.00	8.33	0.00	40.44
Coconut and vegetable oil	4.55	5.33	3.70	3.13	5.80	2.00	0.00	0.00	24.50
Pharmaceuticals	2.27	8.00	0.00	9.38	8.70	2.00	8.33	10.00	48.68
Semiconductors	2.27	8.00	3.70	9.38	8.70	2.00	8.33	10.00	52.38
Mining	2.27	8.00	2.47	9.38	8.70	2.00	8.33	0.00	41.15
Furniture	4.55	2.67	6.17	3.13	2.90	4.00	0.00	10.00	33.41
Automotive and Metal finishing	0.00	2.67	2.47	3.13	2.90	2.00	0.00	10.00	23.16
Total Parameters	44	75	81	64	69	50	24	10	
Coefficient of Impact	1	2	1	2	2	1	2	1	

* Stressed impact on social benefits, health and environmental improvements and listed in the "D.D"

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Table 6
Industrial Ranking

Industry	Based Analysis	Sensitivity Analysis	
		1	2
Piggery	1	1	1
Fish Canning	2	2	2
Semi Conductors	3	3	3
Breweries	4	-	-
Distilling of alcohol	5	4	4
Pharmaceuticals	-	5	-

ANNEX M

GOALS AND PROCESSES FOR POLLUTION MANAGEMENT APPRAISAL AND ENVIRONMENTAL RISK ASSESSMENT

ANNEX M: GOALS AND PROCESSES FOR POLLUTION MANAGEMENT APPRAISAL AND ENVIRONMENTAL RISK ASSESSMENT

A. Introduction

One specified goal of the Philippine government is that of sustainable development. Along this line, the industrial sector is an important segment of the economy contributing to national development. However, sustainable development cannot be achieved if the environment and natural resources are not properly managed. It is in this context that another goal of the Philippine government is to prevent contamination of the environment or loss of natural resources due to pollution from industrial sources.

The Industrial Environmental Management Project (IEMP) is designed to make progress toward sustainable development by working primarily with industry to develop practices to reduce the amount and hazard of industrial pollution. To this end, IEMP takes the current Philippine conditions regarding industrial pollution into consideration and has adapted approaches that have been successfully applied in other countries to meet IEMP's goals and objectives.

Two of the most appropriate approaches which could address pollution prevention or reduction by industry are:

- -- Providing incentives for industry to voluntarily reduce the amount and hazard of waste materials through the use of Pollution Management Appraisals (PMAs); and
- -- Assisting government personnel establish priorities for utilizing its limited budget and manpower resources through the use of Environmental Risk Assessments (ERAs).

The objectives of PMAs are to:

- -- Improve process efficiency.
- -- Reduce the amount and hazard of wastes.
- -- Identify opportunities to reuse, recycle, or reclaim by-products; and
- -- Identify practical steps in waste management.

The PMA is broadly patterned after the environmental audit process commonly used in industrialized countries, but differs in that the process has been modified to meet IEMP's objectives. The purpose of the PMA is not so much for industries to achieve compliance with government regulations, although this is desirable and will be sought after where practical, as it is to find practical ways of reducing the amount of pollution generated by an industrial plant. Based on experience in the Philippines as well as other countries, PMAs will help many industrial facilities find ways to reduce operating and maintenance costs as well as increase profits in the medium and long term.

The objectives of ERAs are to identify firms and industrial sectors that warrant high priority in pollution reduction and prevention. While the PMA process is used primarily to identify methods of profitably reducing pollution, the ERA process will be used by the Philippine government to help focus its limited budgetary and manpower resources on those sources of industrial pollution that pose the highest degree of risk to natural resources, human health, and the environment. As a result, monitoring and enforcement actions can be more effectively directed to help bring high risk industrial plants into compliance.

This paper briefly describes the process of conducting PMAs and ERAs.

B. Pollution Management Appraisal

A Pollution Management Appraisal is a procedure for identifying and evaluating opportunities for the reduction of the volume and toxicity of wastes, emissions, and effluents from an industrial plant. A small team of specialists, the size of which will vary with the size and complexity of the plant, with experience in the industrial processes and environmental management will collaborate with the firm's management to identify pollution reduction opportunities and to estimate associated cost savings.

The appraisal usually requires a few days to review existing information provided by the plant, and is followed by a visit on-site. On-site activities include a site/plant inspection tour and review of records. Following the onsite activities, the team evaluates the information collected and prepares an appraisal report. The report contains recommendations intended to:

- -- Improve process efficiency and material handling practices.
- -- Improve worker health and safety.
- -- Reduce the amount and/or toxicity of feedstocks and/or materials treated as wastes; and
- -- Identify potential net positive financial returns in carrying out various recommendations.

Analyses derived from PMAs will be treated as confidential. If, however, the industrial plant implements some of the PMA recommendations and benefits to the environment and to financial balance sheets accrue, permission may be sought to describe these benefits to other companies as an incentive to participate in the PMA process. Sensitive information which companies may regard as trade secrets, however, will remain confidential.

Why complete an appraisal?

- -- It can be used as a management tool.
- -- It helps identify areas of potential concern to regulatory agencies.
- -- It identifies expansion/diversification opportunities.

-- It helps provide useful information for plant managers to address potential problems.

What are the goals of a PMA?

-- Reducing the amount of waste generated (source control).

-- Identifying opportunities for recycling/reclamation/reuse of wastes, including potential markets for byproducts (recovery and byproduct exchange).

-- Recommending feasible pollution control measures (treatment).

What are the potential benefits?

-- Reduced operating costs.

-- Higher product yields.

-- Reduced waste disposal costs.

-- Reduced environmental compliance costs.

-- Reduced overhead costs.

-- Enhanced company image.

-- Reduced exposure to future liability costs.

-- Increased environmental awareness by plant personnel.

-- Increased worker health and safety.

-- Better protection of the environment.

How will results of the PMA be used?

-- To identify cost savings.

-- To provide an early warning system to potential or existing problems on safety, health, or environmental regulations.

-- To serve as input to company emergency response plan.

-- For environmental data management.

-- To plan for growth.

-- To enhance public relations.

The PMA process consists of three phases of activities, which are described below.

1. Pre-appraisal Activities

a. Sell to Industry

It is imperative that the industry voluntarily accept the PMA program. As a government-sanctioned program, it will only be accepted by industry if the following attributes are highlighted. PMA design and objectives are:

-- Flexible and adaptable to changing requirements.

-- Measurable over time.

-- Consistent with overall management goals.

-- Understandable; and

-- Attainable.

b. Select Appraisal Team

An appraisal team is selected to conduct the PMA. The team should include members with knowledge of the industry sector, all applicable environmental regulations, and waste reduction techniques. The composition and size of the team will depend on the size of the plant and the nature of its production processes. A very small plant with relatively simple processes may have a team composed of only one or two members while a large complex plant may require a three to five-member team.

The PMA team should include plant personnel, as well as specialists or outside technical consultants who will guide the facility representatives in the conduct of the PMA. The use of in-house personnel will increase in-house capacity and will improve the likelihood that the firm will use PMAs as an on-going process to maintain production efficiency.

In order to evaluate the data, team members will have the following skills:

-- Environmental management.

-- Engineering and process control technologies.

-- Toxicology and environmental health.

-- Industrial hygiene and safety; and

-- Accounting.

c. Establish Appraisal Procedures

Once the appraisal team is formed, appraisal procedures will be established that ensure consistency of the process from facility to facility. These include finalizing the facility appraisal program/schedule/itinerary which set out dates, meetings, and appraisal durations for all facilities. During this time, an agreement of confidentiality will be signed between plant management

and the appraisal team members to guard trade secrets and confidential business information if required by the company. However, as stated above, the general benefits accrued from the appraisal will be published for wider use.

d. Notify Appropriate Personnel

The next step is the notification by plant management or the appraisal team of plant personnel or work areas affected by the work being undertaken. This is done early in the process to ensure cooperation from plant personnel.

e. Review Existing Information

The appraisal team will contact plant management or the plant representative to obtain and review existing information and site records which will include the following (where available):

-- Site plans and location maps.

-- Environmental monitoring data.

-- Site activity description and process flow diagrams.

-- Reports of inspections from local authorities.

-- Production data.

-- Materials used and quantity/characteristics of wastes generated.

-- Description of processes that generate wastes.

-- Description of air emissions and effluent discharges.

-- Existing pollution control equipment; and

-- Materials handling practices.

The information listed above is necessary to give the appraisal team a site profile to guide them on the conduct of the appraisal. Besides these, the team also needs to evaluate costs within the plant which include:

-- Solid waste disposal.

-- Operation of pollution control equipment.

-- Energy usage.

-- Materials brought in.

-- Production; and

-- Treatment and storage of materials on site.

f. Send Out Questionnaire

The information-gathering process is usually expedited by a questionnaire. The questionnaire will be designed to elicit information on each of the categories of documents identified above.

2. Site Appraisal Activities

The purpose of visiting the site is to resolve questions raised during the review of the site records and to collect additional data.

a. Interview Facility Representatives

The objective of these interviews is to obtain a description of past and present practices of the plant on environmental protection, waste management, and health and safety, as well as to determine past and present activities carried out for site production and materials handling.

Whenever possible, operators, foremen, and supervisors should be directly interviewed. This step is useful to assess the personnel's awareness of the waste or pollution generation aspects of the plant. Plant personnel may also be aware of possible waste reduction opportunities.

The questionnaire mentioned earlier should serve as a guideline for the questions that need to be asked by the appraisal team.

b. Plant Inspection Tour

The team should thoroughly inspect the plant from the point of raw materials receipt and storage, through all process steps, and to the point at which products and wastes exit to storage facilities, treatment units, or disposal facilities. The purpose of the tour is to enable the team to:

-- Assess waste storage, processing, and disposal facilities.

-- Observe materials and product handling, storage, treatment, and handling.

__ Assess housekeeping practices.

-- Identify areas of environmental concern; and

-- Assess actual production processes.

c. Exit Interview

A final interview is conducted with plant officials to discuss preliminary findings the team has made, to clarify issues not answered in the questionnaire, and to inquire about possible modifications in the process and equipment which may be planned in the near future.

3. Appraisal Report and Assessment

All of the facts, analyses, recommendations, and documentation prepared by the appraisal team will be compiled into a Pollution Management Appraisal Report. Report will include:

a. Possible waste minimization or waste reduction opportunities through:

(1) Source reduction, which includes:

-- production planning and sequencing;

-- process/equipment adjustment or modification;

-- raw material substitution;

-- loss prevention and housekeeping; and

-- waste segregation and separation.

(2) Recycling (on-site & off-site) by:

-- use and reuse; and

-- reclamation.

b. Costs/Cost savings on:

-- Solid waste disposal.

-- Operation of pollution control equipment.

-- Energy usage.

-- Materials brought in.

-- Production; and

-- Treatment and storage of materials on site.

c. Expected returns or improvements in air, water, land, and human health conditions.

d. Recommendations to mitigate potential hazards.

e. Recommendations to conduct further studies or to choose appropriate pollution reduction options.

Finally, a report to management is included in the report. The management report is concise, focused on the recommendations, and designed to lead management to decisions where needed. The team leader should be prepared to discuss the report with plant managers.

C. Environmental Risk Assessment

When decisions are made to address industrial pollution problems and budgets are limited, the public and the environment are best served when limited resources are used to address pollution which has the highest risk of adverse effects on the environment, public health, and people's livelihoods. It is in this context that IEMP will assist the public sector to carry out an environmental risk assessment (ERA).

An Environmental Risk Assessment is a method by which information on the hazard of a certain activity or material is combined with information on the likelihood, duration, and extent to which specified targets (receptors) in the environment will be exposed to this hazard to determine its risk relative to other activities or materials. In an Environmental Risk Assessment, the targets in the environment can include not only people but also natural resources such as habitats, species, and populations. Specified endpoints for the environmental risk assessment may include adverse habitat modifications, toxic effects on biota, or adverse effects on human health or livelihoods.

1. Workshop/Training

The first step of the ERA program is to conduct a workshop on the environmental risk assessment process. The workshop will involve technical personnel from the Department of Environment and Natural Resources (DENR) including the Environmental Management Bureau (EMB), the Department of Trade and Industry (DTI), and probably some personnel from trade organizations and local government units. This group will form the initial multidisciplinary scientific and technical group which will conduct ERAs with project personnel.

In addition to orientation and training in the process, the workshop participants will also develop goals and objectives for the ERA program, establish the scope, and establish working groups for the next step in the process.

2. Goals and Objectives

The ERA will be the mechanism for identifying target industries and facilities for subsequent participation in the PMA process. The ERA will also enable the public sector to identify those industries and industrial sectors which warrant high priority in pollution reduction and prevention through compliance monitoring and enforcement.

Government and contractor personnel attending the workshop will work together to identify achievable objectives for subsequent steps in the Environmental Risk Assessment process.

3. Scope

The scope or coverage of the ERA program is expected to be the following:

-- A systems approach -- i.e., it will focus on an industry or an industrial plant and its associated environment.

-- Routine discharges of wastes or pollutants.

-- Existing discharges from industry; and

-- Habitat modification, human health problems, and toxic effects on biota as specified endpoints.

Other items may be identified and included in the scope in the course of the workshop. A representative list of industries and industrial plants to be include in the ERA will also be developed.

4. Work Groups

Work groups will be established to perform specific tasks such as:

-- Locating and reviewing existing information sources -- e.g., existing environmental monitoring data.

-- Monitoring of different pollution sources in industry.

-- Reviewing related environmental regulations; and

-- Studying results of Pollution Management Appraisals.

5. Literature Review

During the workshop, work groups will be established within the government agencies involved, to review literature pertaining to their fields of expertise. Examples of relevant sources of information include:

-- Existing data from DENR's environmental monitoring activities.

-- Publications on typical waste discharges from various industries.

-- Manuals on hazard identification.

-- Published studies on environmental pathways; and

-- Information from the various databases on chemical hazards/exposure, such as the US Environmental Protection Agency's IRIS database.

Likely sources of information will include publications prepared by World Health Organization, United Nations, World Bank, Asian Development Bank, and US Environmental Protection Agency.

6. Initial Industry Contact

Once substantial information has been compiled during the process of literature review, the group will make contact with industries. Small teams will visit corporate officers or plant managers to explain the purpose of the project and the process and potential benefits to industry of participating in

Pollution Management Appraisals. Interviews and site visits will be used to gauge industry interest in participating further in the project activities.

7. First Report/Work Plan

After an analysis of the initial industry contact is made, the team should conceptualize a work plan which will include target industrial plants and sampling protocols or plans.

8. Primary Data Collection

The work plan will then be initiated by conducting sampling on the targeted industrial plants. Data on hazardous pollutants will be collected based on the following:

-- Use of natural resources by the public and the public's perceptions regarding pollution effects on resource uses.

-- Sensitive/critical habitats.

-- Waste characterization.

-- Potential fugitive emissions; and

-- Exposure.

9. Data Analysis

Data gathered during sampling will be analyzed by the team until they arrive at a final assessment or risk characterization of identified industries or pollutants. As part of its efforts to improve DENR's human resource capacity, IEMP will conduct a Data Collection and Sampling Protocol Workshop for GOP officials.

10. Report Preparation

A report will be prepared for review by government and trade associations that have participated in the ERA program.

11. Agency Review

EMB and DTI will be the primary agencies tasked to review the report for proper action.

12. Final Report

The final report will document the approach, results, and analytical process used in the ERA, and will provide a recommended list of priority industries to be approached for participation in Pollution Management Appraisals. Furthermore, the list of recommended priorities can also be used by government agencies to consider internally the direction and priorities of monitoring and enforcement activities.

D. Risk Management

Dr. C. Claudio has recommended an alternative approach to environmental risk assessment that includes a significant component of risk management and risk communication activities. This approach is outlined below. It may be that this type of activity will be used as a waste management initiative for a particular industry or geographic area after IEMP's Pollution Management Appraisals and IEMP's Environmental Risk Assessments have been conducted.

Risk is a probabilistic description of potential damage from a given hazard, while assessment is evaluation in order to judge or decide. Environmental risk assessment (ERA) is a type of assessment that puts emphasis on risks that arise in, or are transmitted by, the natural environment. Hazardous chemicals used by, or produced in, industry are the principal sources of public concern. [1]

ERA, as a process, must be accompanied by risk communication and linked to risk management. Risk communication is the first step for a developing country, such as, the Philippines where the level of risk awareness is still low. [2] It can lead to the objective (or a set of objectives) for risk management which provides the basis for the scope and design of ERA.

ERA identifies and quantifies risks, for example, to human health and safety (expressed in terms of societal risk or individual risk), the industrial facility itself -- e.g., disruptions and monetary losses -- and the environment -- e.g., air, land and water pollution. It can use the results of Environmental Impact Assessment (EIA) which may have been done previously for the industrial facilities in this project. Such results can be used as inputs for the first and, possibly, the third of the following triplet of risk questions that risk assessment addresses [3,4]:

- -- What can go wrong? What scenarios of causes and impacts to human health and safety, the industrial facility, and the environment may arise?
- -- How likely is it to occur? With what frequency might each scenario occur?
- -- What will be the outcome? What are the adverse consequences?

Answers to these questions are obtained in the ERA following an orderly and scientific process. For this project, the recommended ERA framework is presented in Figure 1. This is the framework developed at the East-West Center and adopted by the Asian Development Bank [1].

The first step -- hazard identification -- uses available evidence and experience elsewhere to choose which hazards deserve attention in the assessment. It may also consider the public's perception of risk but, in doing so, care must be taken that risk to health is not confused with other grievances, such as, presence of unsightly plants.

The second step -- hazard accounting -- sets practical boundaries for the assessment. It defines the parts of the flow cycle (Figure 2) and scope of the system to be considered based on the risk management questions.

The third step -- environmental pathway evaluation -- considers various human exposure routes. This measures how many people, and for how long, breathe, ingest, or have skin contact with a certain concentration of a pollutant. Part of this step is the dose-response assessment (potency determination) and other measurements that relate a pollutant to human health.

The fourth step -- risk characterization -- estimates the risk associated with particular exposures and other adverse consequences. The results of this last step of risk assessment are presented in a useful form to decision makers so that management could take appropriate actions. If the results give rise to more questions, an iteration to hazard accounting is done to refine the assessment.

Figure 1 is a general framework that needs to be adapted to a particular case. There is no universal method that can be used for all cases. The specific design for ERA, particularly the choice of level of analysis, system boundaries, and types of risk expression (Table 1 for options), depends on the type of risk management objective and questions.

For this project, the main purpose of conducting the risk assessment is to determine which industries will have priority allocation of resources for pollution prevention, waste minimization, and cleaner production. The principal objective may, thus, be to achieve the maximum level of protection for a given population under resource constraints. [5] For a facility with hazardous chemicals, some of the risk management questions that may be asked are:

-- What internal and external, routine and accidental events may arise and what scenarios will develop from them that may lead to significant pollution exceeding standards?

-- What is the likelihood of exceeding pollution standards? What are the adverse consequences when that happens?

-- What risk reduction measures may be taken and what is the marginal cost per unit risk reduction of each one?

A scoping exercise at the start of ERA is essential for choosing the most appropriate options in Table 1 that can satisfy the risk management objective and provide answers to the questions being asked.

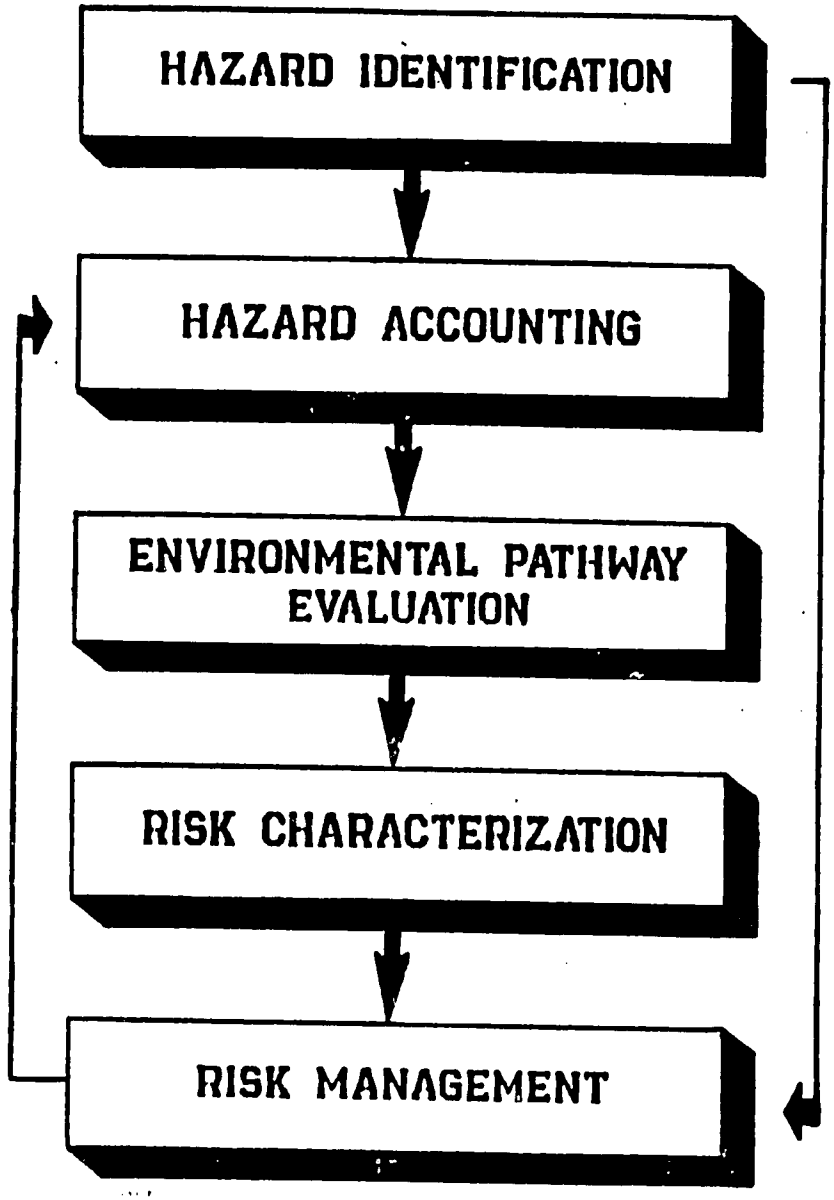


Figure 1. Risk Assessment Framework

Source: Asian Development Bank. 1990. Environmental Risk Assessment: Dealing with Uncertainty in Environmental Impact Assessment. ADB Environment Paper No. 7. Prepared by R. Carpenter, K. Smith, L. Habegger and C. Claudio. Philippines: ADB, Office of the Environment.

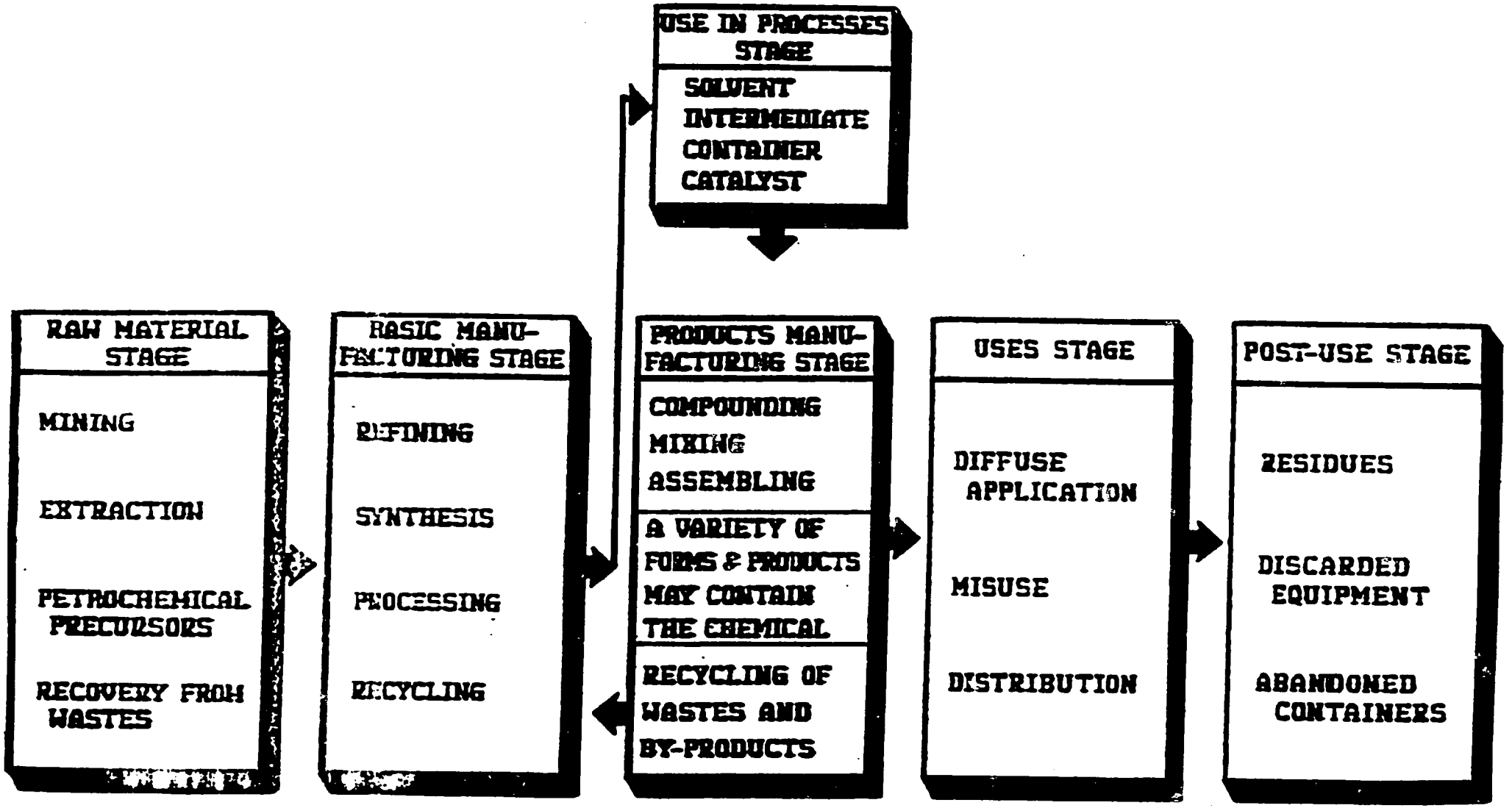


Figure 2. Generic Flow Cycle for Hazardous Chemicals

Source: Smith, K., R. Carpenter and M.S. Faulstich. 1988. Risk Assessment of Hazardous Chemical Systems in Developing Countries. Occasional Paper No. 5. Honolulu: East-

Given the scope of the assessment, the quantification may proceed by identifying the possible scenarios, assessing the frequency of each scenario, estimating the range of impacts of each scenario, and characterizing the results in the form of risk curves (as in Figure 3). Various procedures, methods, tools and models are now available (See [6], for example) for this quantification process. Since quantitative risk assessment is not a trivial exercise, it is important to conduct a screening of facilities to be analyzed. For example, a chemical risk screen relating a case to standards is presented in Figure 4. In some cases, it may be adequate to just adapt and improve further the results of the EIA and conduct a "qualitative" risk assessment -- i.e., one that is not rigorously quantitative.

For a "qualitative" risk assessment, a rudimentary format that may be used is presented in Figure 5. This classifies risks according to their frequency of occurrence and severity of adverse consequences.

This first-level effort of analysis is conducted prior to a quantitative risk assessment. Hence, frequency estimates from similar plants, which are adjusted to account for local conditions, or experts' opinions may be applied. This "qualitative" assessment can help focus on major cases that merit priorities -- i.e., those with unacceptable risks and which require risk reduction measures.

The ERA must use reasonable assumptions, consider a comprehensive set of scenarios, and apply appropriate methods for characterizing the risks. It must also disclose the uncertainties in risk estimates. It must provide clear results as quantitatively as possible which can be used for comparing risks and the benefits of mitigation measures. Such measures may be technical or organizational.

The ERA process, as described briefly here, which consists of a general framework accompanied by scoping, screening, an "qualitative" risk assessment and implemented with a case-specific assessment design, has not been applied in the Philippines. Applying it through this project can contribute to the development of local capabilities, especially in the development of human resources and of adaptable ERA methods, models, and data bases.

ERA ends where risk management begins -- in risk characterization. Risk management applies the results of ERA to produce decisions and actions that can achieve the objective previously defined. In this project, where ERA is to be mainly used by the public sector, several risk management approaches are possible. The major ones are risk management through legislation and regulation, risk management through incentives to the private sector, and a combination of both. These approaches involve values, such as, economic efficiency, justice, and equity. Looking for a balance among these values within an acceptable decision process is more important than looking for an acceptable risk level. [5]

In addition to these major approaches, which are discussed elsewhere in this project paper, the government can also influence the risk management process through other means, such as, the conduct of research on risk-bearing material, technologies, and processes. [7] The results of ERA can also be used to set priorities for such efforts.

Table 1
Options for the Scoping Process in Risk Assessment

Levels of Analysis

Micro (one or a group of pollutants)
Systems (an industrial facility and its associated environment)
National (an industry and its impact on the national economy)

System Boundaries

Routine release and/or accidents?
Which population?
Which parts of the flow cycle?
Which geographic boundaries for each?
Which phases of the project?
Effects for how long into the future?
Which health endpoints?
Which ecosystem risk endpoints?
Which parts of the causal chain?
Interaction with other pollutants/facilities/industries
-- existing or potential

Risk Expressions

Which risk indicators?
Which methods of exposure determination?
Which environmental concentration?
Which final risk measures? Which confidence levels?

Adapted from [1].

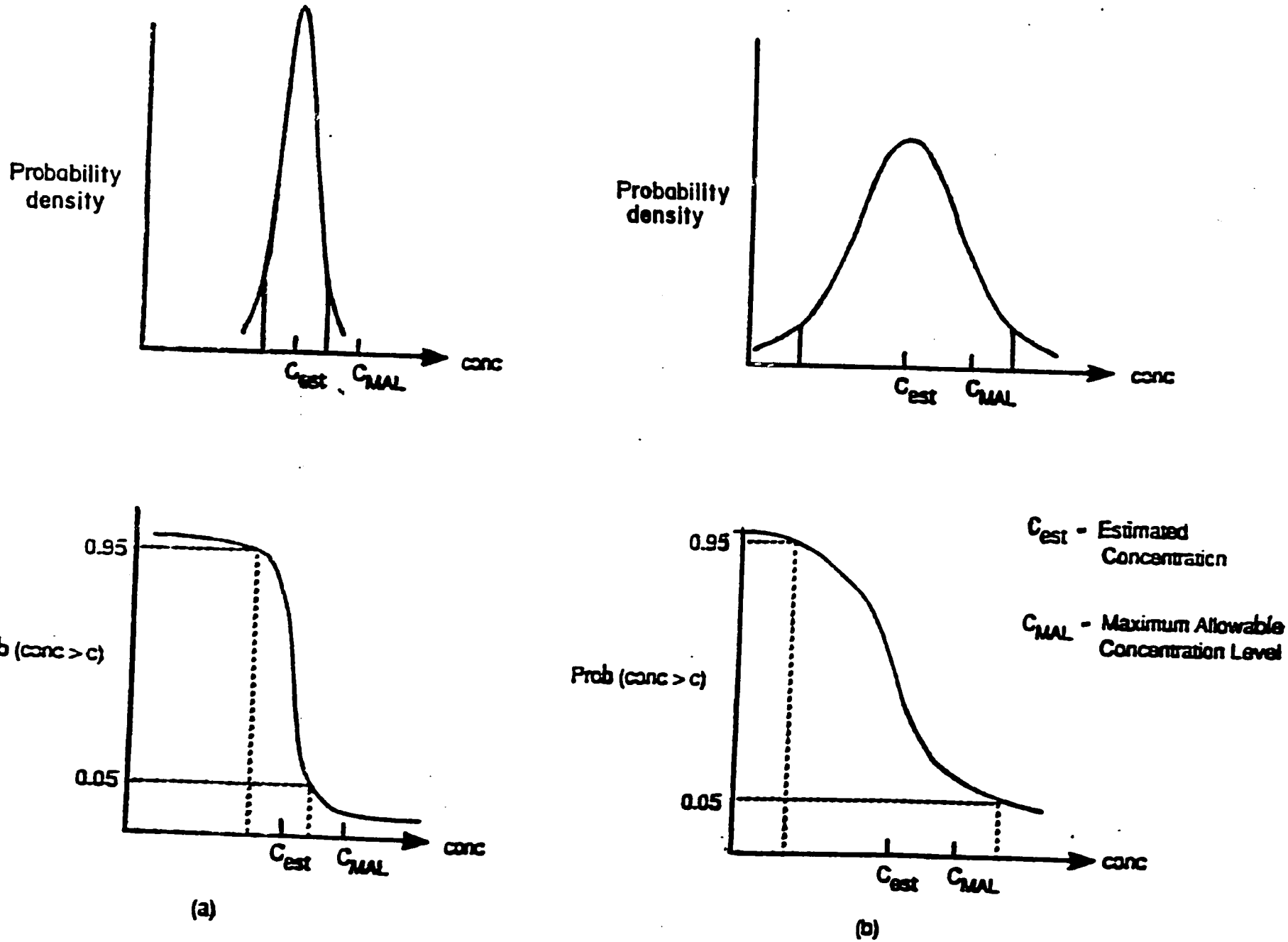


Figure 3. Risk Curves

Source: ADB (1990)

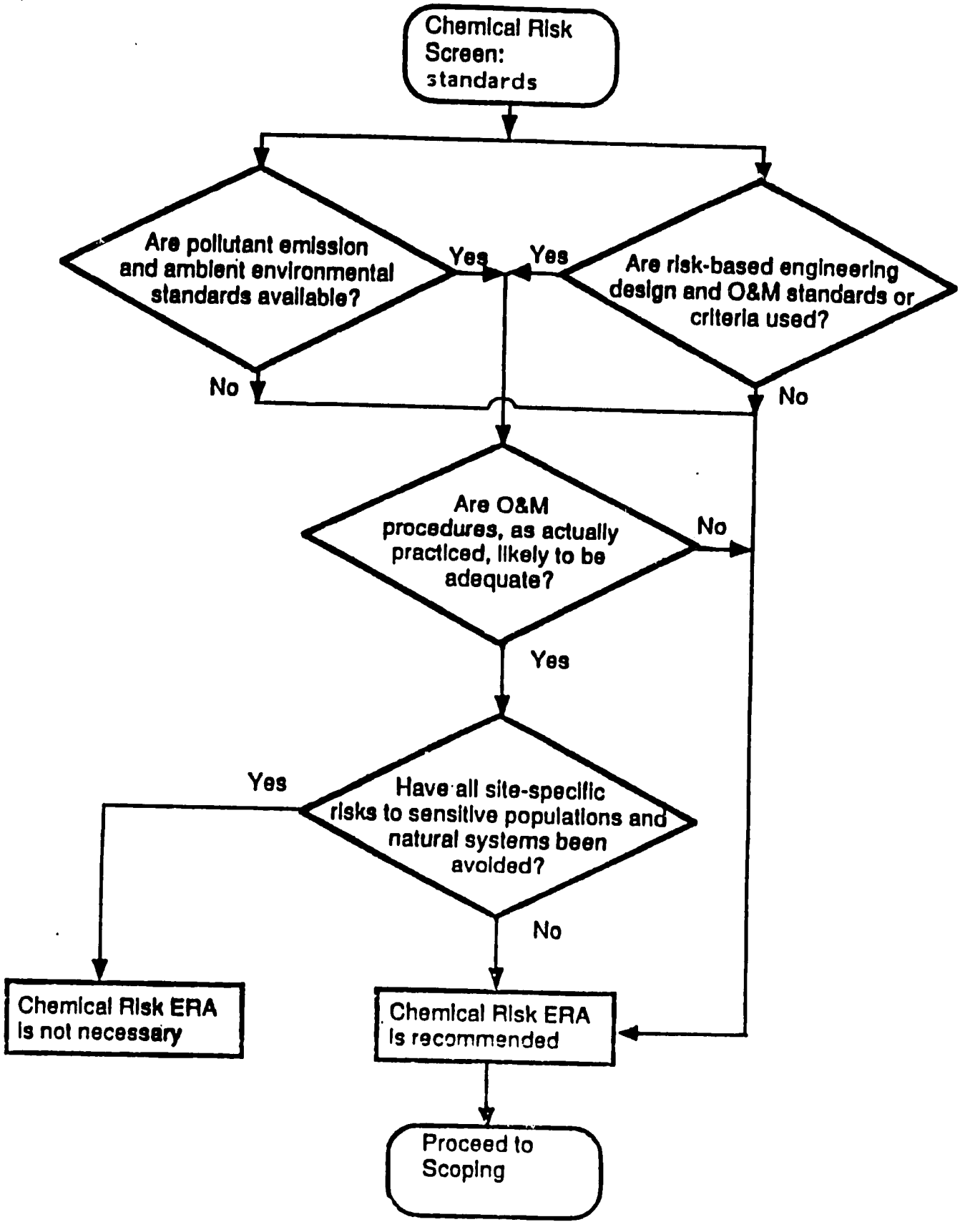
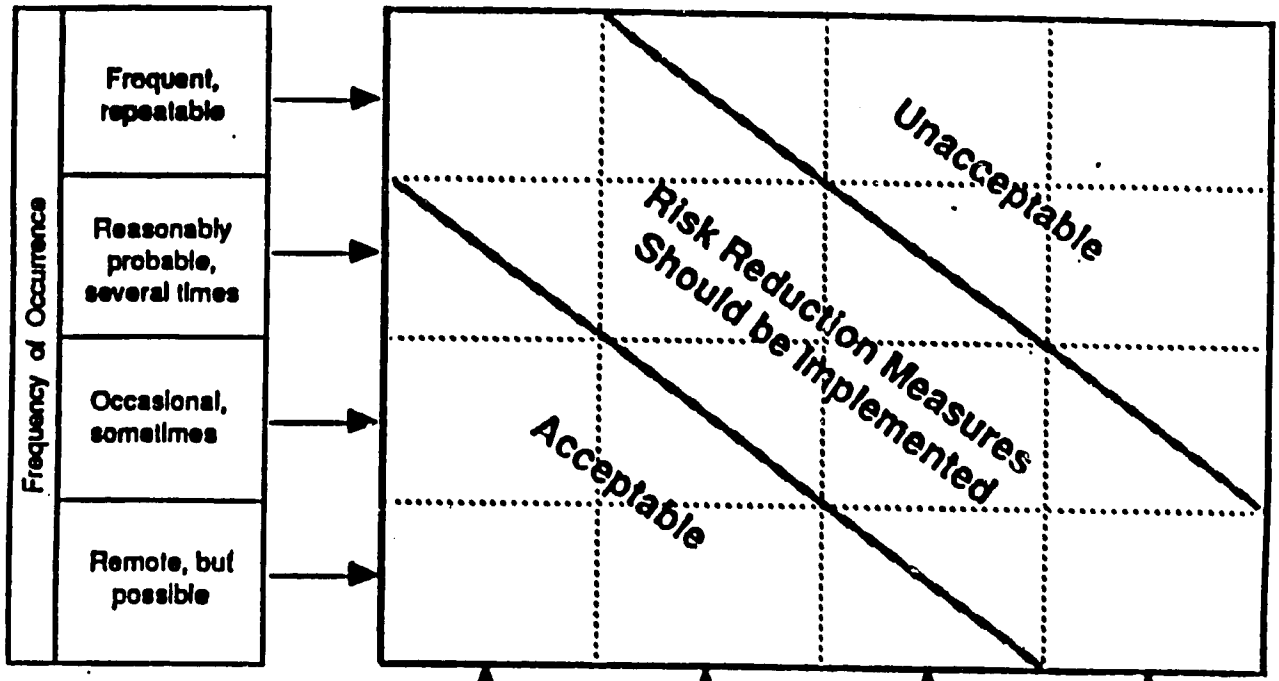


Figure 4. Chemical Risk Screen: Standards

Source: ADB (1990)



		Range of Consequences and Damage			
		Negligible	Marginal	Critical	Catastrophic
Industrial and Community Facilities	Disruption	<1 day for repair	A few days required for repair of facilities	Loss of facilities for >1 month	Widespread destruction of property; total loss of some facilities
	Monetary	<$100,000 damage	$100,000 - $1 million damage	$1-10 million damage	>$10 million damage to property
Human Health and Safety		Minor illness or injury; ≤ 12 mo. lost work time	≥ 12 mo. lost work time from illness or injury	Death or severe illness or injury to ≥1 person(s)	Death to >10 persons; severe injury/illness to >100
Pollution Damage to Ecosystem		Slight, quickly reversible damage to few species/ecosystem parts	Temp., reversible damage. Reversion to earlier successional stage	Loss of keystone species and widespread habitat destruction	Complete, irreversible and immediate destruction of all life

Figure 5. A Format for Qualitative Risk Assessment

Source: ADB (1990)

REFERENCES

[1] Asian Development Bank. December 1990. Environmental Risk Assessment: Dealing With Uncertainty in Environmental Impact Assessment. ADB Environment Paper No. 7. Prepared by R. Carpenter, K. Smith, L. Habegger, and C. PB. Claudio. Philippines: ADB, Office of the Environment.

[2] Claudio, C. PB. December 1988. "Risk Analysis in Developing Countries," Guest Editorial, Risk Analysis. Plenum Press.

[3] Kaplan, S. and B.J. Garrick. 1981. "On the Quantitative Definition of Risk," Risk Analysis. Plenum Press. 1 (1), 11:27.

[4] Claudio, C. PB., R. Carpenter, K. Smith, L. Habegger. In Press. "A New "ERA" for Hazardous Waste Management," Proceedings of the 1990 Pacific Basin Conference on Hazardous Waste , East-West Center, Honolulu, Hawaii.

[5] Pate-Cornell, M.E. 1988. "Setting Priorities Among Health and Safety Policies: A Risk Analysis Approach," Prepared for the World Health Organization.

[6] AIChE (American Institute of Chemical Engineers). 1985. Guidelines for Hazard Evaluation Procedures. New York: AIChE.

[7] Claudio, C. PB. "The Role of Government in Risk Management: A Private Sector's Perspective," Presented at the Second National Risk Management Conference of the Society for Risk and Insurance Management, May 17, 1991, Manila Mandarin Hotel.

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ANNEX N

POLICY STUDIES AND PUBLIC/PRIVATE DIALOGUE

ANNEX N: POLICY STUDIES AND PUBLIC/PRIVATE DIALOGUE

A. Introduction

As the implementation of IEMP progresses, it is anticipated that issues will surface concerning the effectiveness of industry's pollution reduction efforts. Some of these issues may be the result of constraints imposed by policies and regulations of the GOP. These constraints may inhibit voluntary action on the part of industry. As these policy-related issues are identified, they will become topics for policy studies aimed at developing practical recommendations for optimizing voluntary industry action and utilizing scarce government resources efficiently.

While the need for specific policy studies will be determined primarily by the results of Pollution Management Appraisals, the Environmental Risk Assessment and other technical activities, certain policy issues are evident now that should form the basis for policy studies. These include:

-- Gaps in the current environmental regulatory structure and their potential impacts on voluntary industry action.

-- Integration of regulation/enforcement actions and voluntary industry efforts.

-- Incentives and impediments to voluntary industry efforts.

-- Institution strengthening and the distribution of resources among national, regional, and local government bodies.

-- Fines for industrial pollution.

-- Market-based instruments for management of industrial pollution; and

-- Integration of pollution prevention planning and risk assessment into the EIA process.

It is recommended that these studies be initiated promptly. Background information on the issues and how the results of these policy studies could be used are described below.

Other policy studies that potentially may be required are listed below. The need for these or other policy studies will be determined as the results of pollution reduction appraisals and the environmental risk assessment are analyzed by the project team.

Enhancing public/private dialogue is also critical for improving industrial environmental management. Specific activities for improving public/private dialogue on environmental management issues are described below.

B. Policy Studies

1. Background

As noted above, this section describes seven policy studies that are recommended to provide input and direction to the project. The major issues to be examined in each policy study are described below. In addition, this section discusses study coordination, possible information sources and expected uses of the study results.

2. Recommended Policy Studies

a. Gaps in Existing Regulatory Programs and Their Potential Impacts on Voluntary Industry Action

Background of the Issues: As discussed in the "Sustainable Urban and Industrial Environmental Management Review" report, certain gaps exist in the regulatory structure for environmental management in the Philippines. For purposes of this project, the most notable gaps exist in the areas of hazardous waste management, control of toxic chemicals, and protection of ground water resources. As required by Republic Act 6969, DENR is currently drafting regulations for the management of hazardous wastes and the control of toxic chemicals; however, no such effort is currently underway concerning groundwater protection.

The Pollution Management Appraisals conducted as part of this project will examine potential feedstock substitutions, process changes, recycling/reclamation/reuse options for waste materials, and exchange of by-products. Industry may be hesitant or unwilling to make investments in new feedstocks or industrial processes if the regulatory status of these materials is uncertain. For example, a company may be reluctant to switch from one solvent to a less toxic solvent if it has concerns that the less toxic solvent may nonetheless be prohibited (or restricted in use) by DENR in the future. Likewise, a company may be reluctant to invest in process changes that would eliminate the generation of a particular hazardous waste if DENR may regulate the waste material from the new process at a later time.

The purpose of this policy study is to find ways to reduce regulatory uncertainty and to examine how the developing hazardous waste/toxic chemical programs can be structured to encourage the development/use of safe substitutes and clean technologies. The study should examine how the term "waste" should be defined, particularly with regard to materials that are recycled, reclaimed, or reused. In addition, the study should consider the role of permits, deferred or negotiated compliance, or other assurances that DENR could provide to industry that their pollution reduction efforts would not be adversely affected by regulatory changes (at least in the short term).

Possible DENR strategies to be considered include targeting of priority materials and regulatory "clusters"[1]. The study should also consider how the hazardous waste regulations should be structured to minimize the transfer of pollutants from one environmental medium to another.

Approximately 28 percent of the domestic water supply in the Philippines is obtained from groundwater. The quality of groundwater is threatened by a number of different contaminant sources including septic systems, pesticide application, hazardous material storage and waste disposal. While the Water Quality Criteria formerly contained standards for the protection of groundwater, these criteria were dropped in the 1990 revisions. As a result, groundwater resources are essentially unprotected.

With regard to groundwater protection, the study should examine the relative risks associated with various groundwater contamination sources and the extent to which improved housekeeping and other pollution reduction activities could improve groundwater protection. Benefits to the public from improved protection of groundwater should be considered. The study should also evaluate non-industrial sources of groundwater contamination and the feasibility of establishing protection areas for aquifer recharge zones and/or around public water supply wells.

Study Process: This study will require extensive coordination with EMB and DENR Regional Offices staff responsible for the preparation and implementation of hazardous waste and toxic chemical regulations, as well as with EMB and DENR legal staff. The study will also require collection and review of existing data on groundwater contamination and possible field survey of representative water supply well fields and contaminant sources.

The study should include meetings with selected industrial firms to obtain their views on the issues. Firms selected should represent the full range of industry size (in terms of number of employees or sales). If appropriate, trade associations could be used to coordinate these meetings.

The study should also include a review of pollution prevention programs in other selected countries. It is recommended that these include both developed and developing countries.

b. Integration of Regulation/Enforcement Activities and Voluntary Industry Efforts

Background and Issues: While voluntary industry efforts can be a significant role in achieving pollution reduction, it is anticipated that an

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[1] This is a concept used in the United States whereby the U.S. Environmental Protection Agency plans to categorize the air quality, water quality, waste management and toxic chemical management rules it may issue over the next few years for certain chemicals and sources. The purpose of these "clusters" is to foster improved cross-media evaluation and encourage early investment in pollution prevention technologies and approaches.

effective enforcement program will still be needed. Some companies may not recognize the value of voluntary pollution reduction and thus must be required to comply with the existing (and developing) environmental standards in order to control pollution. Without enforcement of these standards, companies undertaking substantial voluntary efforts may actually be penalized by their investments in pollution reduction.

A strong enforcement program can actually create incentives for pollution reduction. In addition, enforcement can help to achieve equity across the regulated community and provide a level of regulatory stability needed to attract new investment.

The overall goal of this study is to determine the appropriate mix of regulation/enforcement action and voluntary industry efforts and how these two components should be integrated. The study should examine the possible use of compliance audits and whether such audits should be mandatory and/or independently validated.

The study should also evaluate the current air quality/water quality permitting system and its role in encouraging or discouraging voluntary pollution reduction.

Various aspects of the enforcement should be considered, including:

-- Should pollution reduction studies be mandated in enforcement actions?

-- Should DENR use enforcement discretion with companies that are making good faith efforts to reduce pollution?

-- Should negotiated compliance schedules be incorporated into settlements agreements?

-- Should the existing structure for penalties and fines be revised to increase the incentives for compliance and pollution reduction?

The role of the public, NGOs and the LGUs should also be addressed by this study. In particular, the study should evaluate the need for citizen enforcement provisions in environmental laws. Finally, the study should consider and recommend methods for measuring progress in pollution reduction. This examination should consider the use of ambient standards, the need for monitoring, and reporting of emissions/effluents/ wastes for industrial facilities.

Study Process: This study will require a review of current laws and regulations as well as an examination of current enforcement policy. The history of environmental enforcement cases in the Philippines should also be examined.

The study should also consider the results of Pollution Management Appraisals conducted early in the project and include interviews with DENR staff, selected

NGOs, and affected industries. Possible uses of compliance audits should also be explored and recommendations provided in a report.

c. Incentives and Impediments to Voluntary Pollution Reduction

Background of the Issues: It is clear the significant incentives already exist in the Philippines for industries to reduce the amount of pollution they create. These incentives include possible cost savings from reduced raw material purchases and from the sale or exchange of by-products. Pollution prevention also offers an attractive alternative to the installation of expensive pollution control equipment in some cases.

It appears that many industrial companies do not understand the current incentives for pollution prevention/pollution control, possibly because these incentives may be ambiguous or indirect. Formerly, investments in pollution control equipment were exempt from certain taxes, but the time frame for this exemption has lapsed. Pending amendments to the Pollution Control Law may provide some incentives for pollution control, but the status of these amendments is unclear.

However, some of the primary incentives for pollution prevention in other countries do not exist in the Philippines. These include liability for clean-up of contaminated sites, high disposal costs for hazardous waste disposal, and taxes on effluents and emissions, among others.

Further, it appears that certain impediments to pollution prevention may exist, including limited access to financing, lack of information/training on pollution reduction alternatives, and limited availability of cleaner technologies, among others.

The lack of certain key incentives, in combination with the existence of the impediments noted above, may limit the degree of pollution reduction that can be achieved on a voluntary basis. The purpose of this study is to identify and evaluate the impacts of key incentives for and impediments to pollution reduction. The results of this study will be used to determine if new incentives should be created and/or if certain impediments should be removed.

The study should consider the following types of incentives: tradeable permits (or credits) for pollution, pollution taxes or fees, liability for clean-up costs, waste disposal costs, feedstock taxes, and insurance costs. The costs and benefits of establishing one or more of these incentives in the Philippines should also be evaluated.

Impediments to pollution reduction, including lack of financing, lack of information/training, lack of enforcement, changing rules and regulations, and the unavailability of clean technologies or chemical substitutes, should also be evaluated. The social costs and benefits of removing certain impediments should be examined and recommendations for removing selected impediments should be provided.

Study Process: This study should be coordinated with DENR, BOI, DOST, and industry representatives. An economic analyses of various alternatives should

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be conducted with the goal of identifying the optimum mix of incentives. Based on the analysis, recommendations for implementing the selected alternatives should be developed.

d. Strengthening Institutions and Decentralization of Resources Among National, Regional and Local Governments

Background of the Issues: The current government structure for industrial environmental management is multi-tiered. Environmental policies and regulations are set at the national level, while implementation of these regulations (in the form of permits and enforcement) is undertaken at both the national and regional level. Land use planning is exercised at the local level, primarily through the establishment of zoning districts. There is a chronic shortage of staff, equipment, training, and other resources at all level of government.

The current emphasis on decentralization must be factored into the technical assistance, training and other support provided by this project. Implementation of the Local Government Code, which will require each LGU to have an "environmental officer" also raises major issues. Funding for such officers will be difficult in most cases and significant training will likely be required. It will be critical to identify the appropriate government units that can best develop and implement the industrial pollution reduction program. The purpose of this study will be to review current government roles and resources, and to identify the appropriate methods for developing and implementing programs and strengthening institutions. The results of this study can be used to direct limited resources in a manner that will ensure best use.

The study should consider the following issues:

- -- Does the current division of responsibilities among government units encourage voluntary efforts by industry?
- -- What is the appropriate role for the national government in issuing permits, evaluating EIA's, initiating enforcement actions, and conducting monitoring programs?
- -- How can the role of the LGU's be effectively expanded? What resources will this require? How can the transition period to full implementation of the Local Government Act be best effected?
- -- How can communication among DENR, regional offices and LGU's be enhanced?
- -- What resources are currently available to LGU's for environmental planning and monitoring?
- -- What resources should be directed at the regional level to expand the use of pollution reduction appraisals and compliance audits?

Study Process: This study will require extensive discussion and coordination with DENR officials and selected regional offices. The current division of responsibilities among government units should be examined and resources available to fulfill these responsibilities evaluated. Recommendations for resource distribution and meeting decentralization goals should be provided.

e. Integration of Pollution Prevention Planning and Risk Assessment in the EIA Process

Background of the Issues: The primary focus of this project is on existing industrial facilities. However, the information to be gained from pollution reduction appraisals and risk assessments could serve as valuable inputs for enhancing the current EIA process.

First, the results of the risk assessment of various industrial sectors could help DENR to focus its resources on those new developments likely to pose the greatest risks to human health or the environment. It may be possible for DENR to evaluate lower risk developments through an abbreviated process that would determine if a full EIA was warranted. (The implementation of such a process would likely require revision of the current EIA regulations.)

The results of Pollution Management Appraisals conducted at existing facilities may provide information on alternative technologies, chemical substitutes, recycling/reuse options or other information that may be useful to parties designing new projects.

In addition, the overall pollution prevention concept should be encouraged early in the planning process so that project designs can minimize pollution impacts.

Study Process: The purpose of this study will be to evaluate methods for integrating risk assessment and pollution prevention into the EIA process. This effort will require a critical examination of the current process and the extent to which risk assessment and pollution prevention concepts are employed. In addition, lessons learned from on-going projects should be identified and their potential value to the EIA process considered. Recommendations should be provided in the form of an implementation plan for modifying the current EIA process. This implementation plan should include support for DENR revision of existing regulations (if necessary).

f. Fines in Industrial Pollution

Background of the Issues: Regulatory policies require a penalty structure for non-compliance. In the Philippines, these fines are low, such that some industrial polluters prefer to pay nominal fines rather than abate their effluents/emissions. An important policy issue is to determine whether the current penalty structure needs revision in light of several criteria that might be proposed:

- -- Deterrent effect.
- -- Administrative efficiency of fine collection.

-- End use of revenues collected.

-- Cost burdens and consequences of higher fines on industrial producers.

-- Vulnerability to corruption; and

-- Alternatives to fines -- e.g., advance deposits.

Study Process: The analysis will describe the current penalty system in the Philippines, reporting on: existing fine levels, reasons why fines are set at these levels; amounts and uses of revenue generated from fines, fine collection methods and costs, estimates of uncollected fines (and explanations for this), effect of current fine levels as a deterrent to pollution, and cost burdens of fines on different kinds of industries.

This analysis will lead to the next step, the development of a revised penalty structure, and/or recommendations of alternatives to fines. The analysis will be conducted by a small team of specialists who will be required to make extensive contacts in government, local communities, and Philippine industries to obtain the data and range of perspectives to draw intelligent conclusions.

g. Market-Based Instruments for Management of Industrial Pollution

Background of the Issues: A national objective in pollution management is to find the optimal combination of policy instruments that will reduce industrial pollutants at minimum overall cost to industry and society. The purpose of this study is to consider how direct regulation compares with market-based incentives.

In direct regulation, governments prescribe regulations which must be followed by the industries so regulated. Penalties are assessed for failure to comply. The system requires an inspection and enforcement system, backed by reporting requirements and inspection procedures.

In market-based approaches, the emphasis is not so much on legal restrictions as on economic incentives. Various market-based approaches are available (see World Bank, The Safe Disposal of Hazardous Wastes (1989), Vol. I, pp. 266-267):

-- Effluent Charges: An effluent charge (or emissions charge) is a tax per unit of pollutant discharged. The approach allows the industrial establishment to decide how much waste to control, the method to achieve that control, and how much waste to simply discharge and pay the fee. This approach is not well suited to toxic pollutants, but may be effective for controlling non-toxic wastes at relatively low cost by providing the producer with choices among different options.

-- Taxes on Industrial Products: Rather than apply a tax to quantities of effluents (which may be difficult to measure), the tax is on quantity or value of product. However, this may require a different level of

tax for each kind of industrial product in relation to the quantity and hazard of pollutants generated as well as the hazards associated with product use and disposal; posing a problem for analysis and administration.

-- Marketable Discharge Permits: For a given type of pollutant, the acceptable level of waste discharge is determined by the legislature, DENR, or other national authority. The regulating agency (e.g., DENR) then auctions permits for this amount, and one permit is needed for each unit of effluent/emissions. These permits can be subsequently bought and sold among industries which need them. Each industrial establishment has the choice of either abating pollutants or buying permits. In this way a given establishment chooses the least-cost alternative for its circumstances, and society achieves a given standard of environmental quality at greatest efficiency.

-- Feedstock Tax: A tax can be levied on the use of toxic chemicals and other materials that serve as feedstocks for various products. This approach can be used to encourage recycling and to discourage use of certain materials that may pose hazards during manufacture, processing, use, or disposal.

-- Deposit-Refund Programs: Every industrial establishment is required to make a deposit in proportion to the wastes it generates. When proof is given that a desirable technology is being used to manage the pollutants, the deposit is refunded.

Various other approaches might be proposed and compared. For example, DENR already uses an Environmental Guarantee Fund. In IEMP, the proposed policy analysis will evaluate this and other economic instruments to determine the best choice of market-based incentives for pollution reduction in the Philippines.

Study Process: A specialist in pollution economics will organize a small study team on this topic, and this team will propose several market-based approaches relevant for the Philippines. Criteria for comparing the different alternatives include: allocative efficiency, equity considerations, administrative simplicity, vulnerability to corruption, monitoring costs, and so on. The team will be expected to make extensive contacts in different kinds of industries in order to evaluate the advantages and disadvantages of each approach under consideration.

The result of the analysis will be a comprehensive report which describes the approaches chosen for comparison; the criteria, methods, and data used to compare them; and recommendations and justifications for a chosen approach (if any). Also, the report will lay out an implementation plan for the selected alternative, backed by estimates of budget and time to achieve results.

h. Other Policy Studies

In addition to those studies described above, the need for other policy studies may be identified during the course of the project. These studies might include, but would not necessarily be limited to:

- -- Appropriate roles of government and donor agencies in establishing environmental business opportunities in the Philippines.

- -- Costs/benefits of establishing community "right to know" programs (i.e., programs requiring industrial facilities to report their pollutant discharges to the public).

- -- Public perception of the sources and impacts of pollution in the Philippines.

- -- Use of full cost accounting in evaluating pollution reduction alternatives.

- -- Impacts of pollution prevention activities in other countries on the Philippines' competitive position in the world economy.

The need for these or other policy studies will be determined based on the results of Pollution Management Appraisals, Environmental Risk Assessments or other project components.

C. Public/Private Dialogue

1. Introduction

A substantial amount of communication between the public and private sectors regarding environmental pollution and protection exists today in the Philippines. This is true despite chronic shortages of resources at all levels of government and within most PVOs. However, the approach endorsed by this project (focusing on voluntary industry pollution reduction) will require enhancement of the existing dialogue. Expanding the processes for public/private dialogue on voluntary pollution reduction, advocacy activities, and other information campaigns will be critical to the success of this project.

While the title of this section is "public/private dialogue" this title can be misleading as to the actual needs of the project. Lines of communication that require enhancement include:

- -- Communication between national government, regional government and the LGUs.

- -- Communication between government and trade associations/Chambers of Commerce.

- -- Communication between government and individual industrial firms.

- -- Communication between trade associations and their members.

- -- Communication between industrial firms and the public living around industrial facilities; and

-- Communication between the government and PVOs.

Recommendations for some of the more critical elements are discussed below.

2. Recommended Programs

a. Expand NGO Participation in Promoting Communication Between the Public/Private Sectors

Because the NGOs represent widely divergent views and interests in the area of environmental protection, they represent a valuable resource for social consideration of environmental protection policies and actions. This resource pool should be exploited to provide input to government decision-making on regulations and policy (see below) as well as to educate and inform the public at large.

Both environmental/public interest groups (PVOs) and industry groups should be encouraged to use their talents to increase the public awareness of pollution impacts, pollution control laws and regulations, and voluntary pollution control efforts. Groups should take advantage of existing public forums such as schools and churches, as well as local/regional public meetings specifically geared to environmental protection issues. These public meetings should be part of an overall information campaign on voluntary industry pollution reduction efforts.

It is anticipated that this will require the contractor to prepare and hold a series of workshops for NGO representatives. These workshops should cover environmental protection laws/regulations, the voluntary industry program, and the role of the public in reducing pollution.

b. Improve/Enhance Public Participation in the Standard-Setting Process and Other Decision-making Activities of DENR

In the past, DENR has experienced difficulty in identifying all the parties potentially affected by a new regulation and determining the impacts of a new regulation on the industrial community. Lack of involvement by the regulated community in the process has led to industry opposition to new regulations and, in many cases, non-compliance.

There is an urgent need to enhance the current methods for obtaining public participation in the standard-setting process. Through this consensus-building effort, opposition to new regulations could be minimized and levels of compliance could be increased.

On the government side, this should include project support to:

-- Identify parties potentially subject to new regulations during the regulatory development phase.

-- Distribute information to potentially affected industries and other interested parties on regulatory alternatives and their costs/benefits.

-- Developing proposed regulations for public comment.

-- Evaluating public comments; and

-- Preparing final regulations based on the proposal and input from the public.

On the NGO side, this could require project support to:

-- Track the development of new regulations.

-- Analyze the potential impacts on member companies (trade groups) and the environment (PVOs).

-- Develop comments and data for submission to DENR; and

-- Explain the impacts of final regulations to businesses and the public.

c. Establish or Promote Environmental Staff Position in Chambers of Commerce/Other Trade Associations

It is recommended that the project support the establishment or promotion of an environmental staff position in the American and Philippine Chambers of Commerce and other trade associations. The role of the staff position would be to:

-- Keep members informed on new developments.

-- Assist members in developing comments and data on draft or proposal rules.

-- Provide input to DENR on environmental matters.

-- Prepare information for the public on industry pollution reduction efforts; and

-- Meet with DENR, the public, other NGOs and member companies, as needed.

This effort could help to educate the public on industry's voluntary efforts and increase the levels of compliance within the industrial community. One option would be to fund (or partially fund) the staff position for a fixed period of time (one year). After that period, member companies would be required to fund the position directly.

d. Communicate Information on Industry's Hazardous Material Usage/Management and Pollution/ Pollution Control to the Public

One of the significant driving forces to voluntary pollution reduction in the U.S. and elsewhere has been the availability to the public of information on emissions, effluents and other wastes from industrial facilities. This

information allows the public to maintain pressure on industry to reduce pollution and provides a baseline for measuring progress in pollution reduction from year to year. Information on hazardous material usage and management is also useful in the preparation of in-plant and community emergency response plans.

It is recommended that this project support the establishment of such a program. The collection of this information may actually serve a dual purpose. In addition to informing the public, it may also create data needed to conduct effective Pollution Management Appraisals. The program will require a determination of which hazardous materials and pollutants will be regulated, what industry sectors will be covered, and what information must be reported. This will likely require assistance to DENR in preparing a regulation.

It will also be necessary to develop guidance and conduct workshops with affected industries in order to explain data collection requirements and estimation techniques. In addition, a handbook should be prepared for the public explaining the information available and how it should be used.

e. Establish Local Oversight Committees For Industrial Facilities

In line with the government's efforts to encourage decentralization and greater local control, it is recommended that the project support the training of local committees to oversee the activities of industrial plants. This committee would be composed of the Mayor, the Sanitation Inspector, the CENRO representative, representatives from local industries and local NGOs, and the general public. This committee could arbitrate environmental disputes and meet regularly to discuss public concerns and industry efforts to reduce pollution.

This effort would require training of local officials on pollution control and monitoring techniques and the voluntary industry pollution reduction program. This effort will require an on-going training program for new local officials as they are elected.

ANNEX O

CAPABILITY BUILDING

ANNEX O: CAPABILITY BUILDING

A. Capability Building Component Goal

The goal of the Capability Building component is to develop increased capacity in the Philippine industrial sector, government sector, and NGOs to conduct a variety of impact assessments, analyses, and appraisals pertinent to pollution management in the Philippines.

B. Training Objectives

By the end of the project, the training component staff (or trainers) will:

- -- Present 20 Introductory Seminars.
- -- Train 200 participants in Pollution Management Appraisals.
- -- Train 60 participants in Environmental Risk Assessment.
- -- Train 300 participants in data collection and sampling protocols for ambient air and air emissions, ambient surface water and effluents, groundwater, and hazardous waste.
- -- Train 200 participants in Compliance Audits.
- -- Train 200 participants in Compliance Monitoring; and
- -- Train 700 participants in Environmental Impact Assessments.

C. Training Philosophy/Methodology

All training programs will use adult education techniques. Training activities will:

- -- Meet participants' needs as determined by pre-training needs appraisals.
- -- Be hands-on skills based practical exercises (otherwise referred to as experiential training) designed to respond to the Philippine context.
- -- Be dependent upon the full participation of all training group members (trainers and participants).
- -- Be based upon participant feedback concerning training content and style; and
- -- Be supportive so that participants are willing to take risks and develop their own analytical abilities.

Practical exercise will be supplemented by lectures. The project team will develop training manuals which will adapt each training program -- i.e., PMA, EIA -- to the Philippine context. The training budget provides for the first training team in each training program to develop a training manual and supporting material (computer assisted training, video-based instruction).

Training programs will be conducted in the Philippines. Unless geographic areas are targeted for project activities, events should be presented in or around Manila because of ease of logistical support.

All training will be short-term. Workshops will require one to two weeks (plus time for practicum and follow-up when appropriate). Whenever possible, the training staff should use the following format:

-- Workshop training.

-- On-the-job supervised work; and

-- Follow-up workshop to evaluate trainees' performance and conduct remedial training as needed.

The above format will ensure that training participants will have both the competence and confidence to use their new skills by the end of the training event (workshop).

The training component will primarily target local environmental management professionals who have the requisite skills needed to master various impact assessment methodologies pertaining to industrial environmental management. Pollution Control Officers, environmental consultants, and representatives from trade associations who could act as a Pollution Control Officer for a number of related firms will be targeted from the private sector. Public sector participants will come from DENR and DTI, as well as other pertinent departments. Regional and LGU officials from these departments will also be trained.

Each of the project's training programs -- Pollution Management Appraisals, Environmental Risk Assessments, Data and Sample Collection Protocols, Compliance Audits and Compliance Monitoring, and Environmental Impact Assessments -- have been designed to engender local training capacity by:

-- Producing a training manual for each program which will be adapted to local conditions, regulations, and expectations.

-- Recruiting training teams comprised of expatriate and local experts; and

-- Suggesting that the project management team reduce, and eventually phase out, expatriate trainers' participation in training events once local training capacity has been developed.

The training component will include on-going evaluations. Each training event and each training session will include explicit training objectives.

Participants and trainers will be required to determine if training objectives are being met. Training evaluations will be both informal (on-going feedback from participants) and formal (written evaluations during and after training events). Evaluations will be presented as problem-solving exercises whereby all members of the training community help to improve the workshop and participants improve their analytical abilities.

The project staff will conduct follow-up interviews with training participants at regular intervals after a workshop. These interviews will determine if the workshops were practical -- i.e., are participants using the skills acquired during the workshops -- as well as how workshops can be improved. Thus, the training staff will be able to ascertain if the workshops are efficient (are training objectives being met?) and effective (do workshops improve professional capacity?).

D. Recommendations Concerning Training Management and Staffing

A U.S. firm should implement IEMP's training component because technical training material will be based upon methodologies developed in the United States. As such, most technical trainers who are competent in the various methodologies are from the United States and they would be most readily identified and recruited by an U.S. firm.

The contractor responsible for the training component will recruit and provide logistical and management support for a host country national Training Coordinator. The Training Coordinator will ensure that training objectives adhere to IEMP's overall project objectives, and that training objectives will be adjusted as project objectives evolve.

Local training firms are capable of providing logistical support for the training component. Two USAID officials interviewed for this report -- i.e., the Training Officer and the Deputy Chief of the Private Enterprise Support Office -- indicated that local training firms are capable of implementing the training component as currently designed. By way of example, the latter observed that the local firm responsible for implementing the private sector training component of the USAID-funded Development Training Project has trained more than twice the projected number of participants in the project's first year of operation.

Two local training contractors were visited to determine their training capacity. Both firms have assembled competent training staffs many of whom have had professional training in the United States. A review of training material indicated that both companies are currently presenting training programs of their own design which are based on adult education methodologies (experiential and practical), and which are innovative as well as responsive to participants' needs. One firm produces training videos which rival any found in the U. S. and do so at one quarter the cost of the United States.

Both local firms indicated that many training facilities exist which could easily accommodate the workshops as currently envisioned. The National Manpower and Youth Council regularly publishes the Directory of Training

Institutes to which the training staff should refer when selecting training site(s).

1. Alternatives for Training Coordinator position

A host country national, as opposed to an expatriate, is recommended for the Training Coordinator position for the following reasons:

-- Sustainability: The Training Coordinator will develop the skills necessary to design and implement training courses for Pollution Management Appraisals, Environmental Risk Assessments, Data Collection and Sampling Protocols, Compliance Audits, Compliance Monitoring, and Environmental Impact Assessments. As stated above, these skills are currently lacking in the Philippines and must be established if project impacts are to continue beyond project termination.

-- Cost: Personnel costs are much lower. Price Waterhouse estimates indicate that the annual personnel costs for an expatriate is $180,000 per year whereas that of a host country national [local hire] is $48,000 -- a savings of $610,000 over the life of the project.

-- Continuity: Due to reduced costs, the Training Coordinator position can be maintained for the entire project period.

-- USAID Policy: The Mission recommends that long-term expatriate project staff be kept to a minimum.

The following is a prioritized list of experience skills which the Training Coordinator should possess:

-- Training: Ten years of experience designing, managing, and delivering training programs preferably targeting mid-career professionals.

-- Environmental Management: Ten years of professional experience in environmental management with preference given to the private sector (industry).

-- Impact Assessment: Five years of practical experience conducting any of the following: Pollution Management Appraisals, Environmental Risk Assessments, Compliance Audits and Monitoring, and EIAs.

-- Organizational Experience: Five years of experience working for an international donor with preference given to USAID experience.

E. Description of Training Programs

1. Introductory Seminars

Number of Workshops: 20
Number of Participants: 50-100
Frequency/Sequencing: 10 at project outset, 10 after completion of Environmental Risk Assessment

Target Participants: Strategic decision-makers, private and public sector

IEMP's operational paradigm is that economic and environmental interests can be concomitant: pollution reduction practices and technologies can render some industrial production processes more efficient and therefore more profitable. IEMP's assumption is based upon the U.S. experience, where the dominant paradigm has been evolving from that of confrontation between environmental interests and industry to that of a mutuality of interests between public and private concerns.

The U.S. industrial sector's "greening" is due in part to increased corporate responsibility, partially to the enforcement of environmental regulations, in part to public and consumer pressures, and partially to the economic benefit derived from pollution reduction technologies. IEMP is devoted to introducing the last-named techniques and technology to the Philippines, but it cannot do so if the industrial sector is not aware that its interests are being met by IEMP's efforts.

The IEMP Training Coordinator and Chief of Party will be responsible for introducing the project's goals, objectives, and rationale to decision-makers in industry, government, and NGOs in order to generate support and to gain entrance for IEMP to conduct the Pollution Management Appraisals. Primary emphasis will be given in the seminars to the anticipated economic benefits to be derived by industry from the Pollution Management Appraisals.

Seminar participants will include selected stakeholders from industries, government, and NGOS with interests in industrial environmental management. These seminars also become the first forum for IEMP's policy dialogue efforts. Possible participants from the GOP could include government representatives from DENR and DTI.

Every effort should be made to develop a case study from the Philippine experience which could be documented and presented on video-tape. As noted above, the capacity to produce multi-media presentations at one quarter the cost in the United States exist in the Philippines.

There will be two rounds of Introductory Seminars. The first will take place at the project's outset and presentations will be made in Metro Manila to national business associations such as PCCI and the U.S. Chamber of Commerce and to industrial associations in General Santos and other cities. The second round seminars will be revised after the team has determined its target industries for the second round PMAs as determined by the Environmental Risk Assessment (see "Proposed Project Implementation" in the Project Paper).

2. <u>Pollution Management Appraisal Workshops</u>

Number of Workshops: 17
Number of Participants: 12
Frequency/Sequencing: First in month 12
Presented on a quarterly basis thereafter

Target Participants: Private Sector Environmental Consultants, Pollution Control Officers, Trade Association Representatives, GOP officials

The initial Pollution Management Appraisal workshop will be designed and presented by a training team of three expatriates and two local experts. The workshops will require six to eight weeks to present and will be broken down as follows:

Training	-	1 week
OJT	-	4-6 weeks
Review	-	1 week

The training group will receive one week's training before joining a PMA team as it conducts an on-site appraisal in the Philippines (OJT). The participants will join in every aspect of the PMA including developing a questionnaire for the firm, on-site inspection, interviews with the firm's management team, analysis, and writing the team's report which will include recommendations for pollution abatement action.

The Review phase of the workshop will be conducted after the PMA is completed and will provide participants with the opportunity to strengthen those skills they found were weak during the appraisal.

Since one of the project's objectives is to develop local training capacity, participants who subsequently develop experience in the field (those who have incorporated Pollution Management Appraisals into their professional portfolio, for example) will be selected as counterpart trainers for subsequent workshops.

Selected public sector officials will receive training in Pollution Management Appraisals so that the government is aware of its objectives and methodologies. The GOP will be more receptive to IEMP and its objectives if it has an in-depth understanding of its methodologies.

It is suggested, for reasons of confidentiality, that GOP officials not join PMAs conducted in private firms in the Philippines. Two alternatives present themselves in this case. First, the Training Coordinator could coordinate with other entities such as World Environment Center (WEC) to schedule government member participation on an Industrial Audit in a third country (in Thailand, for example, where WEC is currently active and is planning to establish a Cooperative Agreement with the Mission). Since the PMA will be adapted to the Philippine context it will differ from other organization's Industrial Audits. The GOP participants will have to be given a quick overview of the methodological differences between the two appraisals in order to minimize confusion. Second, the GOP participants could participate in PMAs being conducted in Philippine parastatals where the question of confidentiality would not be as acute.

Pollution Management Appraisal workshops will be conducted on a quarterly basis throughout the life of the project.

3. Environmental Risk Assessment Workshops

Number of Workshops: 4
Number of Participants: 15
Frequency/Sequencing: First in month 12
Presented on an annual basis thereafter
Target Participants: GOP officials (EMB, Regional/LGU Environmental Officers, DTI) NGOs

The IEMP technical staff, in collaboration with GOP officials, will conduct an Environmental Risk Assessment (ERA) in order to gather data to help orient its second round of PMAs. The ERA will also provide the GOP with data with which it can make rational decisions about where to direct its regulatory actions. An immediate beneficial impact of the ERA would accrue to the EMB staff of nine which is currently charged with the review of 700 EIAs a year. The ERA will provide the EMB with a rational basis upon which to prioritize its review activities.

The EMB staff counterparts on the project design team expressed strong interest in receiving Environmental Risk Assessment training from the project (especially if the training is based upon the Philippine context and is experiential) since they plan to address the national hazardous and toxic waste problem in the near future. In addition, because environmental NGOs in the Philippines are responsible for citizens' interest identification, aggregation, and articulation concerning environmental issues; NGO members should be included in IEMP workshops.

A team of two expatriates and two local experts will been given a month to develop a training design and training manual which is adapted to the Philippine context and to IEMP's objectives. The team will include experts in ecology, water quality, air quality, groundwater, chemistry, public health, and sociology.

The workshop itself will be a week long. Subsequent workshops will be developed in response to public and private sector requests such as those mentioned in the paragraph above. As with all training events, the Training Coordinator will be charged with identifying local experts who are capable of assuming responsibility for workshops in following years, thereby reducing expatriate involvement.

4. Data Collection and Sampling Workshops

Number of Workshops: 3
Number of Participants: 100
Frequency/Sequencing: First in month 17
Presented year 3 and 4 thereafter
Target Participants: Pollution Control Officers
GOP officials (EMB, Regional/LGU Environmental Officers, DTI)

The first workshop will train participants who will be responsible for data collection and sampling activities during IEMP's ERA. Both private sector and

public sector officials responsible for compliance activities require further training in data collection and sampling protocols in order to ensure the accurate measurement of standardized ambient air and air emissions, ambient surface water and effluents, groundwater, and hazardous waste samples. The private sector must increase its ability to conduct technical analyses for EIAs in order to reduce the workload of the over-burdened EMB staff.

A team of four expatriate and two local experts will be charged with developing a workshop training manual. The four expatriates will have expertise in the four areas mentioned in the above paragraph. Participants will be given hands-on training using equipment which they will use for the ERA. As such, provisions have been made in the budget for the purchase of technical supplies and equipment.

The workshop will be repeated in years 3 and 4 of the project in response to training needs expressed by the GOP and private sector.

5. Compliance Audit and Monitoring Workshops

Number of Workshops:	4 each
Number of Participants:	50 (Audit), 25 (Monitoring)
Frequency/Sequencing:	First Audit Workshop in month 15 First Monitoring Workshop in month 21 Presented on an annual basis thereafter
Target Participants:	Pollution Control Officers (Audit) GOP officials; EMB, Regional/LGU Environmental Officers, and DTI (Monitoring)

The Compliance Audit and Compliance Monitoring Workshops are similar yet represent two methods for ensuring responsible environmental management. Compliance Audits are typically conducted by a regulated company (either internally or by consultants) to evaluate the company's operations and their compliance with government regulations. Compliance Monitoring, on the other hand, is the responsibility of the government. Thus, Compliance Audit workshops will be conducted for the private sector and Compliance Monitoring workshops will be conducted for the public sector.

The two types of compliance workshops are designed to support IEMP objectives by improving local professional environmental management capacity. Whereas the objective of a PMA is to reduce pollution; Compliance Audits and Compliance Monitoring workshops will be geared towards evaluating industrial operations and their compliance with government environmental regulations.

The Compliance Investigation Workshop will be devoted to helping the EMB meet its environmental monitoring responsibilities as called for in Strategy 6.4 of the PSSD -- to impose plausible sanctions upon industrial firms which are out of compliance with regulations. The private sector participants in the Compliance Audit workshops will be Pollution Control Officers from firms which are interested in ensuring that their companies are in compliance with government regulations.

Training manual preparation for the Compliance workshops as well as workshop presentation will require one expatriate and two local experts. The expatriate will have expertise in chemical or environmental engineering and the local experts will have complimentary skills to complete the training team. Public sector participants will be given hands-on training using equipment which they will use while conducting monitoring activities. As such, provisions have been made in the budget for the purchase of technical supplies and equipment.

6. Environmental Impact Assessment Workshops

Number of Workshops:	7
Number of Participants:	100
Frequency/Sequencing:	First EIA Workshop in month Presented on a semi-annual basis thereafter
Target Participants:	Pollution Control Officers, GOP officials; EMB, Regional/LGU Environmental Officers, and DTI

Training in Environmental Impact Assessment methodologies has been recommended because there is a need to improve private and public sector capacity to conduct this important component of the environmental management process. Private sector officials (Pollution Control Officers and plant managers) regularly request training in EIA methodologies which would include a review of government regulations as well as EIA methodologies. As mentioned above, the EMB currently reviews more than 700 EIAs annually partially because the private sector lacks the expertise to admissible EIAs. Training for Pollution Control Officers in EIAs should reduce this burden for the EMB.

In accordance with its goal of improving professional environmental management capacity in the Philippines; IEMP's EIA training will concentrate upon training EMB officials who are currently responsible for reviewing industrial project EIAs. The EMB EIA review staff is currently divided into task forces which are responsible for sectors such as Industrial and Solid Waste, Resource Extraction Industries, and Energy and Infrastructure. The training component will target those staff members who are responsible for the review of EIAs of those industries which are associated with IEMP.

At the time of this report, the EMB staff was still developing a detailed workplan which will determine how Local Government Unit Environmental Officers will be recruited and trained. IEMP's training staff will have to consult this document when planning its training workplan to determine if IEMP can also help LGU Environmental Officers improve their capacity to conduct and review EIAs.

The project implementation team will need to be aware of donors which are planning EIA training projects in response to the GOP's decentralization policies. The Asian Development Bank (ADB) plans to fund a feasibility study (the Bank refers to such studies as Technical Assistance projects) in conjunction with the EMB in September of 1991 though it has not yet developed a scope of work. In addition, AIDAB's two-year Strengthening Environmental Assessment Project is scheduled to begin by December of 1991. It is designed to provide EIA training for EMB and Regional staff.

The UNDP also is a planning human resources development strengthening project in the environmental management field. The UNDP project, while not providing EIA training, will target LGU officials so there will be a need to maintain contact with that project. The UNDP might be able to provide remedial training for officials (such as the newly appointed LGU Environmental Officers) who lack requisite training and skills for IEMP workshops.

The EIA training team will consist of two expatriate and two local experts. The first training team will be charged with developing a training manual for the workshops. The workshops will last ten training days and will draw from a variety of fields of expertise such as those listed in Section 8 below. The workshops have been scheduled on a semi-annual basis because of the great demand for EIA expertise in the Philippines.

F. Environmental Education

Even though it is a major area of GOP interest, IEMP does not include training in environmental education. IEMP does not include environmental education because:

-- IEMP's primary training objective is to improve professional environmental management capacity. Environmental education activities would not contribute to meeting these objectives.

-- The ADB is planning a major environmental education project as spelled out in Strategy 9 of the PSSD.

As such, training participants in most environmental education issues will not help IEMP meet its objectives.

The team should maintain contact with the ADB project officer responsible for the bank's Technical Assistance project charged with conducting a study of environmental education. The project officer evinced great interest in collaborating with the IEMP training staff to incorporate its various appraisal and assessment methodologies into appropriate university-level course curricula. The ADB anticipates that it will provide a $20 million concessional loan in 1993 to incorporate environmental education curricula into the Philippine school system.

G. Strategies to Ensure Sustainability

IEMP's objective is to improve industrial pollution management. The training component's objectives can be divided into two major strategies. The first strategy is to train individuals in impact assessment techniques. The second strategy is to develop an impact assessment training capacity beyond the life of this project. This latter strategy will be carried out by:

-- Recruiting and training a Training Coordinator.

-- Actively recruiting local experts as IEMP counterpart trainers and determining when expatriate participation is no longer required in training; and

-- Attempting to incorporate the project's PMA, ERA, Compliance Audit, Compliance Monitoring, Data Collection and Sampling, and EIA training manuals and methodology into the local universities' curricula or that of the proposed National Institute for Environmental Research and Training (a proposal has been submitted to JICA for consideration).

All three strategies will lead to the creation of a new professional service industry in the Philippines -- Industrial Environmental Management.

One concern which is common to all human resources development programs is that participants, once trained, will seek more lucrative markets in which to offer their services. In this instance, industrial and chemical engineers, toxicologists, and other professionals will acquire a skill which will enable them to work in the industrial sector worldwide.

The design team consulted personnel managers at two professional firms as well as government officials to solicit input concerning the "brain drain" issue. All persons interviewed stated that their companies base their HRD decisions upon the following realities:

-- The Philippines market can not compete with other markets (the Gulf, OECD countries) on a purely financial basis; and

-- Established professionals are less likely to seek employment overseas than are younger professionals.

The officers suggested that training program participant selection should be partially based on their ties to the Philippines and their organization. Participants with direct family responsibilities and a responsible position in an organization tend to remain in the Philippines more often than those people who do not have such ties.

A final recommended strategy to promote sustainability is that participants pay a training fee. A service which is received without cost is not valued and a training fee will ensure that workshop participants are in attendance because they believe that they will derive a benefit from the skills they will acquire.

USAID policy requires that participants' organizations continue to pay salaries and travel costs. These costs, however, are not directly associated with participation in a training program. A fee which is directly associated with the service to be rendered, and is labeled as such, should be included as part of the training program costs. The fees should not be so high as to be prohibitive. For example, the DTP has a sliding fee scale of P 100 to P 1,500 depending on the participants' ability to pay.

H. Participant Baseline Expertise by Training Program

The following is a list of the types of expertise which would be identified to participate in the training component. Job titles of positions targeted by

the workshops are included parenthetically though many job-holders lack the requisite skills and expertise called for in each workshop.

For example, EMB officials indicated that most Environmental Officers at the Regional level are foresters who were selected for the position by their supervisors. Most lack the requisite training for the position and have not yet received EIA training though the EMB is currently presenting such workshops (to be supported by AIDAB project funds). Once EIA responsibility has devolved to the LGU level, the skills level of workshop participants could diminish further.

1. Pollution Management Appraisals

Chemists & Chemical Engineers
Environmental Engineers
Water Pollution Control Engineers
Mining Engineers
Metallurgists
Industrial Engineers
Ecologists/Biologists
Toxicologists
(Pollution Control Officers)
(Production Managers)
(Plant Managers)

2. Environmental Risk Assessment

Water Quality Specialist
Air Quality Specialist
Groundwater Specialist
Public Health Specialist
Sociologist
Chemist/Toxicologist
Ecologist
Occupational Health/Safety Specialist
Environmental Engineer
Sanitary Engineer
Environmental Planner/Manager
(EMB, DTI, LGU officials)

3. Data Collection and Sampling Workshop

Chemist/Toxicologist
Water Quality Specialist
Air Quality Specialist
Environmental Engineer
(Pollution Control Officers)

4. Compliance Audit and Monitoring Workshops

a. Audit

Environmental Engineers

Ecologist/Biologist
Civil Engineer
Environmental Lawyer
(Environmental Officer - LGU)

b. Monitoring

Air Pollution Control Engineer
Chemist
Ecologist/Biologist
Hydrologist
Environmental Engineer
Industrial Engineer
(Pollution Control Officer)

5. Environmental Impact Assessment

Air Quality/Pollution Analyst
Geologist
Soil Scientist
Environmental Engineer
Ecologist/Zoologist
Economist
Land Use Planner
Sociologist
(Pollution Control Officer)
(Environmental Officer)

I. Training Component Cost

The Financial Analysis section of the Project Paper presents the component's budget in great detail. However, a few assumptions concerning the training team's level of effort (LOE) must be made explicit. The preparation time required for each training event was minimized through the following measures:

1. Trainers' Level of Experience

It was assumed that all expatriate members of the training team would be senior level experts. As such, their daily rates were calculated upon a $15,000/person month (22 day month). The same assumption, that trainers would be senior-level, holds for the local trainers. The figures cited for LOE are for work days only. Trainers will work a six-day work week (26-day month).

2. Training Team Level of Effort

The design team attempted to minimize training preparation time through the following measures:

a. Developing a training manual which is adapted to the Philippine context

The manual will indicate to expatriate trainers how the PMA has been adapted to local conditions.

b. Creating the Training Coordinator position

A full-time staff member will orient expatriate trainers and to convey to them lessons learned from previous training events.

c. Incorporating local counterpart trainers in the training team

Preference for counterpart trainers will be given to experts who were participants in earlier training programs. The Training Coordinator should make a conscious effort to identify and recruit local trainers and to determine when the local technical training capacity is sufficient to reduce (and finally end) expatriate participation.

As such, expatriate and local training LOE budgets for only one preparation day per presentation instead of 1.5 or two days preparation per presentation day. LOE was based on the following basis:

(1) Expatriate Trainer LOE = 2x + 5 days (workshop presentation time is equal to x).

x days = Presentation time
x days = Preparation time
3 days = Round Trip travel time from the U.S.
2 days = report writing time.

For example, expatriate LOE for a 5 day training program is 15 working days. LOE was expressed in person months for planning purposes.

(2) Local Trainer LOE = 2x + 2 days. Same as above except for travel.

(3) Travel Costs

The design team assumed that each training event would be presented by a separate training team. Thus, each training event includes international travel costs for a full complement of expatriate trainers.

Alternately, travel costs for the first training event in each program (PMA, ERA, Compliance Audit etc.) does not include airfares since the training manual development team will present the first training event (to field test the manual).

3. Pollution Management Reduction Appraisal Workshops

Number of Workshops: 17
Training Team: 3 expats, 2 locals

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Training Manual Development LOE (one time only):	1 month/team member
Presentation LOE:	Expat - 17/ (51 total) Local - 14/ (28 total)
Follow-up:	Expat - 7/ (21 total) Local - 7/ (14 total)
Number of Participants:	12
Frequency/Sequencing:	First in month 12 Presented on a quarterly basis thereafter
Target Participants:	Private Sector Environmental Consultants, Pollution Control Officers, Trade Association Representatives, GOP officials

4. Environmental Risk Assessment Workshops

Number of Workshops:	4
Training Team:	2 expats, 2 locals
Training Manual Development LOE (one time only):	1 month/team member
Presentation LOE:	Expat - 15/(30 total) Local - 12/(24 total)
Number of Participants:	15
Frequency/Sequencing:	First in month 12 Presented on an annual basis thereafter
Target Participants:	GOP officials (EMB, Regional/LGU Environmental Officers, DTI)

5. Data Collection and Sampling Workshops

Number of Workshops:	3
Training Team:	4 expats, 2 locals
Training Manual Development LOE (one time only):	1 month/team member
Presentation LOE:	Expat - 15/(60 total) Local - 12/(24 total)
Number of Participants:	100
Frequency/Sequencing:	First in month 17 Presented year 3 and 4 thereafter
Target Participants:	Private Sector laboratory technicians GOP officials (EMB, Regional/LGU Environmental Officers, DTI)

6. Compliance Audit and Monitoring Workshops

Number of Workshops:	4 each
Training Team:	1 expat, 2 locals
Training Manual Development LOE (one time only):	1 month/team member
Presentation LOE:	Expat - 15/(15 total)

	Local - 12/(24 total)
Number of Participants:	50 (Audit), 25 (Monitoring)
Frequency/Sequencing:	First Audit Workshop in month 15 First Monitoring Workshop in month 21 Presented on an annual basis thereafter
Target Participants:	Pollution Control Officers (Audit), GOP officials (EMB, Regional/LGU Environmental Officers, and DTI [Monitoring])

7. Environmental Impact Assessment Workshops

Number of Workshops:	7
Training Team:	2 expat, 2 locals
Training Manual Development LOE (one time only):	1 month/team member
Presentation LOE:	Expat - 25/(50 total) Local - 22/(44 total)
Number of Participants:	100
Frequency/Sequencing:	First EIA Workshop in month 12 Presented on a semi-annual basis thereafter
Target Participants:	Pollution Control Officers, GOP officials; EMB, Regional & LGU Environmental Officers, DTI

ANNEX P

PRIVATE SECTOR VOLUNTARY PARTICIPATION IN ACHIEVING ENVIRONMENTAL GOALS

ANNEX P: PRIVATE SECTOR VOLUNTARY PARTICIPATION IN ACHIEVING ENVIRONMENTAL GOALS

A. Objective

In spite of intensive efforts by most nations during the last two decades to minimize pollution, industry, transport and agriculture continue to contribute to deterioration of the environment. New environmental problems have emerged, including those arising from greenhouse gas emissions and ozone depletion while long standing problems, such as acid deposition and dispersal of toxic chemicals continue. The great majority of environmental problems stem from private sector actions. Regulation has achieved limited change, but has been inadequate by itself to achieve larger objectives, particularly in the developing world.

The Philippines is no exception to the pattern. Through a process of adoption and modification the Philippines has established a substantial and comprehensive body of environmental legislation and regulation. It has been largely unsuccessful, however, in altering the continuing pattern of environmental degradation. Enforcement of the regulations would require enormous public sector resources, and would still encounter cultural obstacles which could stop it short of an acceptable goal.

Regulation and enforcement alone, though essential, are not sufficient to achieve national goals. An additional approach is required. As the private sector is the source of most of the problem, only the private sector has within its control the ability and the resources to alter the pattern. As enforcement is insufficient, the active participation of the private sector must be elicited on a voluntary basis. For that to happen they must see their participation in their own near-term and long-term interest.

A combination of government and non-government interest groups can serve as a vehicle and a force to bring about the shift in natural resource management so badly needed for a viable national future, but they require active participation of all sectors of the economy to do so. Government can help redirect priorities, policies, programs and projects to achieve immediate economic opportunities as part of a strategy to maintain, enhance and restore the productivity of the natural resources base of the Philippines. It can do so though careful development of the country's entrepreneurial ability and spirit, through institutional change, and through enhancement of opportunities for its youth. The result will be a practical application of "sustainable development" through the creation of new industries and jobs in resource stewardship: a new way to do business successfully and continuously in the Philippines. The NGOs can be the facilitator and the vehicle of this change.

Government cannot achieve all of its objectives with the available resources. It must leverage those resources, and the key means to do so is to enlist the support of private sector resources. In leveraging its resources it can not only induce compliance with environmental regulations, it can create new self-sustaining ventures which will help to achieve its objectives while also generating new income and employment. Together, government, non-government

organizations (NGOs) and business can lead the way to a new definition of resource management, complementing the regulatory function of government by promoting clean production and supporting in a focused way new ventures and even new industries which will lead to sustainable management of the natural resources of the Philippines.

B. Strategy

In order to achieve the ambitious national environmental goals of the Philippines the public and private sectors, government and business must work together collaboratively, not confrontationally. To achieve this, a new strategy is needed which coordinates three principal thrusts of an integrated approach to change the bottom line calculation of business.

-- Regulation, enforcement and monitoring -- all placing pressure on business to comply with established standards.

-- Infrastructure development -- providing the physical and financial means by which to comply with regulations and to take voluntary initiatives.

-- Information, coordination and facilitation -- helping business to understand their options and the positive and negative consequences of each.

Regulation, enforcement and monitoring are the essential means by which to place a financial and social cost on undesirable options, altering the financial calculation of the company in a market economy. The costs of polluting options must be not only the fines and possible closure imposed by Government, but also the cost of a bad public image. Monitoring through voluntary NGOs can play a significant role in establishing this cost element of the calculation.

Infrastructure comes in many forms. It is a hazardous waste disposal facility, itself a profitable private sector venture, which makes it possible for an industry to comply with regulations without the prohibitive cost of building its own disposal facility. It can be access to financing for new ventures, such as a disposal facility or conversion of a waste stream to a profitable product, or a process change to achieve cleaner production. Funds could come either from a special loan fund created for such a purpose or from commercial lenders which understand that clean production and environmental investments are profitable. In this case access to infrastructure depends on information, which laps into the area of the third strategy element.

Or it is a Government bureaucracy which responds efficiently, whether to a request for information or in the permitting process. Collectively, access to infrastructure changes the business calculation in favor of the environmentally preferable options and provides the means for the private sector to respond voluntarily.

Information, coordination and facilitation (ICF) is the area in which government, business and the public can cooperate to bring about change. Even

in an age of information, research still cites lack of information as a principal obstacle to more desirable corporate decision. The objective of this element is to help business management to understand all of its policy, procedural and technological options, and to understand for each the full extent of financial and social costs and benefits. Business must be assumed to make decisions largely on the basis of a bottom line calculation. Through lack of information it may either fail to include real costs from factors such as public image, or it may simply fail to evaluate an option of which it is not aware.

ICF can be accomplished by Government, by business itself, singly or cooperatively, and by a wide range of NGOs. It is the latter, including chambers of commerce, industry associations, business foundations, environmental interest groups, community organizations and others which are the facilitators of the ICF.

C. Routes of Response

The pressure placed on the private sector by a coordinated strategy should be for more than strict compliance with environmental regulation. It is pressure to become an environmentally responsible corporate citizen, seeking ways in which a company can contribute positively to ecologically sustainable development. There are a number of ways in which the private sector can respond:

-- Waste minimization through improved housekeeping.

-- Waste reduction or elimination through investment in process change or change of raw materials.

-- Processing, exchange or other conversion of wastes to a profitable product.

-- Investment in new profitable ventures which are ecologically sustainable; and

-- Direct action through NGOs to help relieve existing environmental problems external to the business.

Each of these types of action requires substantial information. Waste minimization is the simplest and least costly solution, yet even there businesses often lack experience and can learn from their associates. Process change involves more extensive technology transfer and access to information on new processes which may be unknown locally. Waste conversion requires both extensive technical information and either a knowledge of a new market or an effective coordinating body which can find a user for wastes as a raw material.

Investment in new ventures requires the most extensive and complex form of information. Most managers do not have the resources and do not consider it their normal role to seek out new investment opportunities. An outside stimulus may be required, identifying new opportunities and conducting

prefeasibility analyses. It is still a matter of bringing new information to the attention of management so that it can evaluate new options.

Working with NGOs on projects such as the clean-up of environmental impacts also involves a transfer of information to business. The NGOs are both part of the pressures on management and a route to positive action. The NGOs can serve constructively, both to make corporate management aware of the image (and possibly market share) price they may be paying, and to show management routes by which to resolve the problem. In the case of a community-based NGO in a community impacted by an industry, the relationship may be very direct and symbiotic.

Information, the coordination of flow of that information and the responses to it are the key to voluntary corporate action. The key in turn to the flow and coordination of information is the facilitators. They can reach business in its own environment and on its own terms to an extent that Government can never achieve. In most cases they can both elicit information from business which can be shared, and they can be heard by business without a defensive posture.

D. Facilitators

There are many different types of facilitators, some conservative, some activist, some very local, others international in scope. Their principal objectives vary enormously, from those whose objective is better corporate profits to those who seek an unpolluted world. They find a common goal in efficient, clean production and ecologically sustainable industry. They also have a significant common aspect -- they work with information.

The facilitators and what they can accomplish fall loosely into four categories:

1. Chambers of Commerce and Industry

Chambers of Commerce and Industry have the objective of supporting their members, whether by developing positions on lower taxes and protectionist tariffs, or by disseminating information on new markets and interested investors. They are not specialized by industry, though they often have committees to deal with the interests of specific industry sectors. Increasingly they have environmental committees, both to support the growing environmental services and equipment industry sector and to help their broad membership understand and respond to environmental regulations and issues.

Chambers are ideally situated to reach a large and varied audience of businesses. They can effectively disseminate information, either industry non-specific or to a particular industry group. Their greatest impact is in broad spectrum dissemination, since most industry groups also have an industry association which works closely its industry members.

In the Philippines the lead organization is the Philippine Chamber of Commerce and Industry (PCCI) with over 1,400 corporate members and 72 local associated chambers throughout the Philippines. It has a substantial professional staff

and active programs in market research, statistical development and information dissemination through publications and meetings. In addition, there are nine national chambers representing the interests of foreign companies (US, Australia/New Zealand, Canada, Europe, Japan, Taiwan, India, Spain and Korea), as well as the Philippine Association of Multinational Companies Headquarters, Inc. (PAMURI) representing the interests of multinational corporations (MNCs).

Activities that the chambers could undertake to promote voluntary corporate actions include:

-- Workshops/Seminars on subjects such as development of a responsible corporate environmental policy

This would include introducing corporations to opportunities for community action, as well as how to relate productively to Government and the public. The international and multinational organizations can draw effectively on the experience of their MNC members.

-- Research on public opinion concerning various business sectors

This information will both advise the corporations of the costs they are already paying and exert peer pressure to adopt new courses of action.

-- Conducting training programs on waste minimization, waste management, financing environmental control and other topics of concern to a broad membership.

-- Establishing a forum to promote communication between business and the government regulatory body in the development of both general and specific environmental regulations.

-- Conducting market analysis for ecologically oriented products or for the products of clean production.

-- Conducting policy studies on the overall costs and benefits of clean production and ecologically sustainable products by which to influence national legislation and programs. By providing tax and other incentives to represent the value to the nation of certain corporate decisions, the government can further shift the corporate bottom line decision. Policy economic studies can show that it is in the national interest to offer a tax incentive now rather than incur litigation and clean-up later.

-- Acting as a clearing house to help members find either new investment opportunities or investment financing for their own operations to achieve cleaner and more ecologically sustainable production.

Chambers of Commerce are particularly well situated to reach small and medium enterprises, which are often overlooked by Government in its need to deal with the major polluters. Chambers can provide information and other support to

SMEs which they can not afford commercially and for which they may be reluctant to approach government.

2. Trade Associations

There are 126 registered trade associations in the Philippines, most of which represent an industrial group or some form of economic activity which has environmental consequences. The trade associations have much the same objectives as the Chambers of Commerce, to promote the interests of their members. They are much more specialized in their interests, however, focused on a single industry and the subset of problems which it faces.

The associations are therefore a better forum for specific technology transfer and for detailed analysis of options specific to the industry. The range of their possible actions is otherwise similar to those for chambers, and includes:

-- Workshops/seminars on technology options for waste minimization, waste management and process change to achieve clean production.

-- Organizing a special industry environmental and safety organizations to share waste minimization and control experience and other non-sensitive data within the industry.

-- Conducting market analysis of new and ecologically sustainable improved products.

-- Conducting training programs in waste minimization and management.

-- Working collaboratively with government in the regulatory development process.

-- Identifying and developing ecologically sustainable investment opportunities specific to an industry.

-- Searching for new clean production and waste conversion technology and acting as an agent of technology transfer; and

-- Research on industry image and conducting public information programs to recognize environmentally positive actions of members.

The trade associations are more directly concerned with the bottom line impacts of the actions of their members. If by research, analysis and information dissemination they can show their members the benefits of new options, they can probably get support from their membership for the continuing actions to carry out an active program.

3. Business-Oriented NGOs

There are a number of NGOs which grow out of the business community and for which the environment is either a principal concern or one of many concerns. Phili)ine Business for the Environment (PBE) is established specifically to

promote voluntary action by business in achieving national environmental goals. Its purpose is to act as a vehicle where business can collaborate with government and NGOs to promote ecologically sound management decisions. It proposes to help develop the skills, knowledge and general awareness of its corporate members, while providing government and the public a business perspective of environmental concerns, particularly in regard to the environmental legislative and regulatory process.

Organizations such as Philippine Business for Social Progress (PBSP) are concerned with a broader range of issues, though very much including ecologically sustainable development. Other business related organizations for which the environment is an important issue include the Management Association of the Philippines (MAP), Makati Business Club (MBC), Financial Executives Association (FINEX) and many more. Each of these organizations has already explored the issue of ecologically responsible business, and each is willing to take a constructive role.

Actions which they can undertake are again similar to many of those for the chambers of commerce, though focused in some fashion on their particular areas of interest. In general their interests are less technology oriented than those of the trade associations. For example, access to capital is often an obstacle to a company making an investment for process change or waste conversion. Financial institutions have traditionally seen investment for environmental control as having no productive value and resulting in a net bottom line loss. Much has changed in recent years, and there are now many tangible examples or profitable and environmentally beneficial investments. FINEX could undertake a program or workshop with financial institutions to change that perspective and make both financial executives and financing institutions more open to new options.

Organizations such as PBE, MAP and others can act as a forum or arbitration body where ecological interest groups, business and government can reconcile differences. A version of this has been undertaken by the Technology, Risk and Development Foundation (TRDF) as an Integrated Risk Communications Assessment and Management Program (IRCAM). It creates a forum in which industry managers can communicate with the community directly impacted by their plant in seeking cooperative solutions.

Business NGOs can also productively undertake a variety of information workshops, as well as policy studies. They are well situated to undertake the type of study mentioned above which is focused on assessing the national economic costs of failing to induce positive corporate actions versus the economic incentives needed to induce those actions.

Overall, the business-oriented and business related NGOs are in a good position to act as a professionally neutral forum to seek resolution of issues while also working to change attitudes within business toward a more open and ecologically oriented approach to management decision-making.

4. Ecologically-Oriented NGOs

Ecological action groups can play a collaborative and constructive role with business without sacrificing their independence or goals. In many instances

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enlightened corporate management which wishes to make a positive external contribution to solving environmental problems neither knows what is needed nor has the human means to deliver the assistance. The NGOs often have their proposed programs but lack the resources to implement them. There is an obvious match, though between parties which have traditionally had great difficulty communicating with each other.

The NGOs and the corporations must be willing to deal as peers with what each may have viewed as the devil incarnate. Someone must initiate the contact. Since the NGOs have the project ideas and more established communications among themselves, they should collectively maintain a clearinghouse of projects and a forum in which the two groups can find mutual interests. It i important that business and NGOs work together and are seen by the public as true co-sponsors of projects, not just the NGO extracting guilt money from business.

Corporations may be the initiators, however, in a situation where they impact surrounding communities and want to establish community-based programs to reduce those impacts and otherwise help the community.

Environmental NGOs, perhaps in partnership with business based NGOs, can act as a forum to resolve environmental disputes. They can also act as intermediaries between business and government in the environmental legislative and regulatory process.

Finally, they are often the watchdog for the environment, monitoring corporat actions and bringing transgressions to the attention of the public and Government. As such they serve as part of the pressure on business to be ecologically responsible. They also have the potential to be a positive element for business by recognizing accomplishment, and by using their grass roots network and their public stature to reward environmentally responsible management. Just as chambers and other organizations may establish programs of annual environmental evaluation and through it reward the accomplishments of members, so also can the ecologically oriented NGOs carry out their own review, and make public both the negative and the positive results.

Overall, the activist NGOs have an important role to play in informing the public. Their thrust has been to seek out the problems and bring them to light. Undoubtedly this will continue to be a principal direction. They can play an equally effective role, however, working with business to achieve substantial ecological results through collaboration between all aspects of the public and private sectors.

5. Collaboration

There are fundamental beliefs in the Philippines which demand public and private sector cooperation in solving natural resource problems. Sustainable resource management is important in itself for the nation's economic well-being and for the overall quality of life. The citizens of the Philippines share this belief and are eager for both government and industry to take immediate action. The enormous effort to repair past environmental problems and to prevent new ones is best achieved by a productive partnership between the public and private sectors. This must be accomplished not solely through

confrontation, which may make cooperation impossible, but through collaboration in which all parties achieve a desired goal. The facilitators, the many forms of non-governmental organizations, are the means to this collaboration and to causing business to adopt ecologically responsible management.

6. Donor Support

There are many ways in which an external donor can help to make possible the role of the facilitator. Most NGOs, even business-sponsored chambers and trade associations, have limited funds for other than their basic functions. Their membership is usually not inclined to give them more funds for actions which they vaguely perceive may not be in their best interests.

A donor-established fund is needed from which supporting grants and technical assistance can be made available to organizations to carry out programs and actions which will promote ecologically responsible management by business and greater voluntary participation by the private sector in achieving national environmental goals. The fund should both support existing programs and promote the rise of new NGOs focused and informed on the issues of ecologically responsible business. Uses of such a resource could include the following:

-- Support the core operations of key NGOs and foundations whose programs are targeted at public-private sector environmental programs -- e.g., PBE and industry-specific environment and safety associations.

-- Support the establishment of new industry associations specifically for environmental and safety action, exchange of information, etc.

-- Support specific relevant programs of various non-profit organizations -- e.g., IRCAM of TRDF or an environmental program within a trade association.

-- Support workshops, seminars, etc. of chambers, associations and other NGOs.

-- Fund studies on policy, regulatory impact, investment options, financing options, etc. by any of the facilitators.

-- Support creation of new support organizations -- e.g., a Philippine Conservation Corps, which can serve an important social development purpose while making skilled inexpensive manpower available to the private sector for environmental projects, including rehabilitation of damaged lands and for emergency and disaster relief.

-- Provide a funds transfer mechanism to help finance innovative and cooperative industrial solutions -- e.g., technical assistance and concessional funding for incremental investment in hazardous waste disposal capacity beyond the plant requirements of the investing corporation.

-- Support development of feasibility studies and project development activities for needed infrastructure -- e.g., a toxic/hazardous waste disposal facility.

-- Support the development of an overall strategy to induce private-public sector collaboration and voluntary private sector action; and

-- Develop handbooks, training materials, etc. for associations and others to use in training programs.

The facilitators are almost always low overhead, partially voluntary organizations which can greatly leverage modest resources. They have been particularly successful in the Philippines, and represent the highest potential yield in donor resources. To carry out some actions described in this paper through commercial channels will cost many times more and will never have the access that NGOs enjoy in the Philippines. As facilitators they represent the most effective and efficient means to bring about private sector voluntary participation in achieving ecologically sustainable development.

PROGRAM OPPORTUNITIES

A wide range of individual program elements is possible. Four examples are briefly described below.

A. New Investment Opportunity Development

A great number of opportunities exist in the Philippines to establish new business ventures which are both profitable and environmentally desirable. Materials recovery and recycling, conversion of waste products to industrial uses or new end products, combustion or other conversion of wastes to energy, rehabilitation or conversion of damaged areas, sustainable mariculture, aqua silviculture for mangroves, eco-tourism and non-destructive use of materials from tropical forests are but a few of the possibilities.

In order to make investments happen in these areas DENR must undertake to design and demonstrate commercially viable ventures. When convinced they are viable, DENR staff will then present this information, along with clear interpretations of applicable investment regulations and other aspects of the business climate to both financiers and technical specialists of the relevant industry. In effect, DENR must act as a venture developer, bringing the

information and the prospective parties together to facilitate new investments.

The toxic and hazardous waste disposal industry is an excellent example of an investment possibility. It is both a needed investment in itself and it will provide the infrastructure to assist other existing and potential industries to meet environmental regulations.

With continued industrial expansion in the Philippines there is a rapidly growing need for environmentally safe disposal of toxic and hazardous wastes. Many industries now dispose of such wastes inappropriately, damaging both surface water bodies and aquifers and creating severe health risks to area residents. Some companies manage to contain and partially process their wastes, but proper toxic and hazardous waste disposal at an individual plant level may be prohibitively costly. A commercial scale disposal operation is required in order to make the investment in equipment and disposal site financially viable. Most industries do not know what their options are, or how to increase those options, or most important how to make a profit disposing of wastes correctly. DENR can help to overcome these problems.

The proper disposal of toxic and hazardous wastes also provides an excellent example of the opportunity for a multifaceted and coordinated effort by DENR to achieve its program objectives. The first aspect of the effort involves the regulatory program which should be rigorously enforced in order to make the industries feel the pressure. DENR can refine the regulations to make proper disposal procedure and criteria both clear and feasible. DENR can also increase compliance pressure on industry by developing improved monitoring and enforcement capability, such as through environmental NGOs and business associations.

A second aspect of the coordinated effort is a public information program which makes the importance of the issue known to the public, thereby increasing the pressure, while simultaneously making known the possible solutions. This will work through the media and possibly through public fora in which industrialists can interact with the people whose lives are affected by the improperly disposed wastes. This program aspect can bring enormous community pressure and even peer pressure on industries, not only to comply with regulations but also to work to substantially improve the environment of their area. This element also makes the solutions known both to the public and to the firms and provides a vehicle for conflict resolution.

Finally, the third aspect of the coordinated effort is to help implement the solutions by providing industry a way out through promoting private investment in a toxic and hazardous waste disposal facility. This will provide the affected industries a financially acceptable solution to their dilemma by creating a commercial waste disposal industry. To do so DENR must carry out market research (e.g., types and quantities of wastes for disposal) and a preliminary business feasibility analysis, clarify the applicable environmental and investment regulations, and seek out firms experienced in the sector and assist them to explore the possibility of investing in disposal installations in the Philippines.

All three aspects of the effort are essential. Most important, they must be coordinated in order to achieve results and DENR must orchestrate all three aspects. It is unlikely that DENR can depend on other agencies to undertake parts of the combined effort.

The toxic and hazardous waste disposal industry is a particularly timely example of needed investments which DENR can help to facilitate through a new investment promotion program. It is, however, only one of many possibilities which are found in almost every sector of the economy. What is needed is a systematic program to identify and analyze the opportunities and to effectively present those found commercially viable to potential investors.

B. Renewable Resource Investment Fund

It is clear that we have entered an era in which our economic prosperity, the condition of our environment and the quality of our lives will be determined by how carefully we manage our remaining resources.

The short time horizon of traditional year-to-year budget planning in government is on a far different time scale than the natural resources it seeks to manage, in which it may take 20 years to grow a tree and more than three budget years to rear a fish. Five to ten-year planning is routinely used in many industries, such as electrical utilities and the chemical industry. Too many companies, however, spend their days making tactical responses to turbulent markets over which they have little control. In these circumstances the overwhelming dominance of short-term pressures causes too little attention to be paid to the problems of the next decade, still less to the next century. We thereby drift into troubles which preventive action and careful investment could have avoided. Clearly, the time has come when DENR must provide leadership for progressive adjustment to the uncertainties of resource availability over the long term.

In 1980 the Legislature of the State of California wrote into law the concept that some of the revenue from California's non-renewable resources such as minerals and oil should be devoted to the protection and improvement of California's renewable resources -- its productive streams and other natural systems, and its opportunities to harness the energy in these resources. The Energy and Resources Fund, which includes the Renewable Resource and Investment Fund, vastly expanded California's ability to manage and enhance its productive resources.

The theme of this program implemented by the California Resources Agency is investment. The real breakthrough of the Fund was the recognition that the health of the large and strong state economy was vitally linked to the health of the natural resource base, and that continuing investments are necessary to maintain, enhance and restore the productivity of that resource base. As the farmer must invest in his fields, we must all invest some of our annual returns and dividends in all of our resources. In such a case, the government has a responsibility to show leadership to organize the private and public sectors to accomplish that goal.

The non-renewable-to-renewable theme is only one conceptual approach to finance the transition. For example, some of the capital we use up (the non-

renewables) needs to be invested in the capital that we will depend on in the future (the renewables). Many other approaches will do the job, so long as they protect the productivity of the resource base.

Selective investments in California's resource base have:

-- Protected and increased jobs in tourism, forest, fishing and other industries.

-- Preserved and increased recreational opportunities, particularly in urban areas; and

-- Maintained and expanded the productivity of natural systems.

This program includes a 20-year plan for managing natural resources, providing the framework for investment decisions. For the first time in California's history resource managers can weigh short-term strategies and decisions in light of their long-term goals.

A sound resource policy is central in the fight to reduce inflation and increase employment. Projects which enhance the productivity of a natural resource or reduce dependency on costly, diminishing fossil fuels are counter-inflationary. In this era of economic and fiscal constraints, sound investments in natural resource management are part of the solution, not part of the problem.

The Philippines can create such an investment program, utilizing both public and private sector funds. The essential starting point is a long-term investment strategy and the professional capabilities which will convince national government, donors and corporations that investments made by a Renewable Resource Investment Fund (RRIF) will yield immediate benefits while building a long-term return in economic stability and employment to justify the contributions one must make today.

Investments made with loan funds from the multilateral lending institutions must yield a monetary return as well as a national asset return in order to repay the loans. This can be accomplished through investments in a variety of commercial ventures which either manage the natural resources in a productive and sustainable manner or find solutions for environmental problems which themselves promote increased economic activity.

With a convincing long-term investment strategy DENR can secure funding from a number of sources. Most notable will be the bilateral and multilateral donors, but also foundations, corporations and the national government will be interested to invest. The program will in turn encourage joint venture public-private sector investments in environmentally sustainable agriculture, agro-forestry, marine resource development, manufacturing, energy generation and agro-industrial projects.

The fund will initiate a joint effort among public agencies and sources of capital, private lending and financing institutions and bilateral and multilateral assistance donors. It will draw from these sources to provide financial planning, technical assistance, loan guarantees and direct

development financing for ventures which can make identifiable contributions to sound natural resource management. Key to the success of the RRIF will be the use of innovative alternative financing schemes, such as public-private partnerships and debt swaps, including debt-for-nature swaps.

C. The Philippine Conservation Corps

Like the disenfranchised youth of many of the world's larger cities, the youth of the Philippines are today faced with many new and some not so new options as we move into the 1990s. Over half of the country's population is under the age of nineteen and many of these youth find few rewarding social and employment opportunities. These youth will eventually join an increasing population of young adults who are frustrated in both social and career settings. Competition for opportunities will increase and rural to urban migration, due to lack of opportunity in rural areas, will aggravate urban problems. Some may choose to leave for other destinations offering even less in the way of professional, social or cultural support, and others may turn to socially undesirable ways of life.

At the same time, the country today faces a fast growing need for direct action on a number of issues related to environmentally sustainable economic growth. The maintenance of an acceptable and productive environment must be a forefront issue if the Philippines is not to be overcome by the inherent changes and outside interests that are predictable for the coming decade. Not only will population growth and the introduction of new technologies simply force major changes, but growing international interest in Asia and the Pacific for its human and natural resources will bring vast new challenges for the improvement of the quality-of-life in the Philippines.

Far from being a time for despair, the 1990s are a time to consolidate human resources and a time to invest not just in infrastructure but in the fabric of society and its culture -- in the youth who are the future. If met with the appropriate knowledge and technical skills, these challenges can greatly enhance the Filipino's quality-of-life. Clearly, there is a need to assist today's youth with a clarification of their values, hopes and desires. We must also find a way to create new incentives and opportunities toward which they can focus their hard earned self-esteem and marketable skills.

One means to do so is by establishing a youth-oriented program called the Philippine Conservation Corps (PCC). The PCC may be a joint public-private sector partnership for the purpose of organizing and setting up the program. The program will seek to achieve self-sustainability as an NGO and eventual withdrawal of the involvement of both the public and the private sector partners. The PCC would be adapted from the experience of the California Conservation Corps established in the early 1970s. This extremely successful program is now in its nineteenth year, and it may be tapped to assist in establishing the PCC.

The PCC's major goal will be to provide participating youth with an opportunity to enhance personal growth while directing their efforts towards community service in the realm of environmental control and restoration. It is not a conventional training program wherein students pay tuition fees. It is perhaps more appropriately called a youth enterprise development and

employment program, wherein special community projects become the vehicle for training through an emphasis on problem solving and action, in areas like small business management, natural resource management, tourism, forestry and various technical skills.

The PCC will offer opportunity to maximize the strong social and community involvement skills and values of Philippine youth while preparing them for the next phase of their professional and adult lives. The program will use both "hands-on" and classroom training to offer an approach to meet pressing local needs in a way that is financially self-sustaining and with minimum reliance on government funding.

Participants will be carefully selected on established criteria. They will be asked to commit to a minimum two year "assignment," although such commitment would not be legally binding. They will be paid a minimum wage while employed in the program, and the PCC schedule will be approximately 30 to 50% classroom training, and 50 to 70% field work and community action projects.

The five principal functions of the PCC can be described as:

-- Restoration and conservation work under contract with appropriate government agencies.

-- Natural resource management, restoration and enhancement work under contract with private sector organizations.

-- Education and training in business, trade and professional skills.

-- Emergency response using a decentralized and rapid deployment capability of the trained cadre of corps members for natural and man-made disasters; and

-- Enterprise operation and management in rehabilitation and public services and in materials recovery and fabrication.

While the core of the program will reside in the first three functions, and the financial self-sustainability of the program is largely derived from its community service projects, the fifth function of the Conservation Corps, enterprise operation and management, is seen as the ultimate goal of the program -- to empower youth with the skills and resources needed to pursue socially responsible forms of enterprise development. The idea taps a growing potential for small to medium-scale industries that could, for example, target value-added processing of natural resources and agricultural products, or that could perhaps work to minimize or recycle the growing accumulations of waste now burdening the country. These are just a couple of examples, and there is no shortage of real opportunities.

D. Targeted Information Program

An information program targeted at the private sector will have many elements to identify positive and constructive things both the firms and the affected public can do to prevent or remedy problems. Collectively the elements will

be designed to make both those who control the sources of impacts and those impacted aware of the causes and nature of the problems and of the actions which are possible to redress them. DENR already has in place many elements of a public information program. What is needed now is a strategy and implementing program elements specifically to reach the business and industrial community and the public impacted by those communities in a coordinated fashion. The objectives of this strategy will be greater private sector support and participation in meeting national economic development and environmental objectives.

Technology transfer is one aspect of an information program, designed to make industry aware of technological options available to solve resource and environmental problems. The DENR can undertake a program of technology data collection and of workshops to introduce to Philippine industry new processes and technologies which are more environmentally benign than those currently in use. An example is the introduction of alternatives to the use of chlorofluorocarbons (CFCs) as refrigerants, solvents, fire extinguishers and other applications. Use of CFCs contributes to both destruction of the ozone layer and global warming. Substitute chemicals have been developed only recently in response to increased awareness of both problems.

Through a series of industry-specific workshops NRDC can take an active role in the introduction of these and other environmentally preferable technologies. Technology transfer programs can also be used as a means to encourage more environmental R&D, showing how the end products of such R&D can often be highly profitable.

Showing the means to reduce waste at the source is another form of technology transfer. As with energy conservation, dealing with the issue at the source gives the best return on investment. Good housekeeping or minor investment in process change can often reduce the amount of waste generated by an industry, usually reducing the industry's operating costs. The DENR can sponsor a series of industry-specific workshops on waste source reduction for highly polluting industries such as printing, electroplating, alcohol, paper pulp, petroleum and others. Experts from the industries concerned can be secured free to lecture at the workshops through the World Environment Center, a US organization whose members are major industrial corporations.

Through enhanced liaison with business groups, such as the Philippine Chamber of Commerce, the several international chambers of commerce and the industry associations, DENR can create improved channels by which to reach the private sector with information and proposals. By providing guest speakers, articles in organization journals and participation in relevant committees DENR can make business increasingly aware of its objectives and resources and can solicit support for its programs. Good communication is the necessary precursor to cooperation, and the objective of DENR will be to communicate and demonstrate that it is a potential cooperative partner. Business can find bottom line reasons to cooperate on environmental issues, but business may not often approach the subject area spontaneously. DENR can reinforce its cooperative posture by selectively taking equity positions through NRDC in desirable projects to get them going. At a later date its equity holdings may be sold, perhaps to workers in the venture.

A public forum on industrial environmental impacts will bring about both understanding and opportunities for solutions. Many industrial managers do not realize the impact that their plants have on nearby residents, and most of the people affected believe that they have no recourse to abate the pollutants endangering their lives. The DENR can assist NGOs to establish a program of public meetings between industry management and the affected people on a plant or area specific basis. Such meetings will provide a much needed mechanism for conflict resolution. Each forum would be preceded by an in-plant analysis of pollutant streams and possible abatement procedures.

Simple measures by an industry can often appreciably abate its impacts. Based on better understanding the industry may agree to take more significant steps in order to improve relations with the community, which may include many of its own employees. Often there are ways in which the community can participate in the abatement actions. In general, information programs and fora should seek means to involve cooperation from private citizens, for example in seeking alternatives to dumping wastes into rivers and canals. Overall, the public fora will seek mutually agreed and supported programs of action, based on cooperation and the voluntary compliance of both the citizens and industry rather than on enforcement.

A targeted information program will have other elements such as strengthening links of NGOs and PVOs, both with DENR and with corporations. In particular the DENR may provide seminars to PVOs on how to approach the private corporate sector for support of PVO programs. The important point is that the various elements exist within a coherent strategy designed to reach all aspects of the private sector and to show how it is to its advantage to participate in the national environmental program.

E. Workshop on Corporate Environmental Policy

In North America and Europe a transition has taken place in recent years called the "greening of business" in which corporations have adopted environmentally responsible policies in their actions and in their products. Many corporations have gone beyond the normal boundaries of their own operations to engage in public programs and community-based projects which make positive contributions toward good resource management and an improved human environment. Other corporations have invested in projects which convert wastes to useable products or utilize natural resources in a sustainable manner, often quite profitably.

These changes have been driven by a combination of regulatory pressures, consumer demands and preferences, profitability and the enlightened perspective of some corporate officers. These forces are starting to emerge in the Philippines though not all are yet apparent. However, the popular demand for sustainable management of the nation's resources is growing daily. With improved communications and more active public information programs, the rising force of consumer preference is not far away.

When the tide of public opinion turns there will be considerable confusion among Philippine corporations as to what is expected of them and exactly what are their options. As happened in the more developed countries there will be

delays and false starts. In some cases there may be well-intentioned bad decisions based on poor information.

Many members of the American Chamber of Commerce are multinational corporations whose headquarters have already passed through the "greening" transformation. They have established responsible environmental policies and many have carried out innovative programs. Though the experience of some Philippine branches is limited to their internal policies, their corporate systems can offer a wealth of experience and ideas in both internal and external activities.

There is an opportunity for the American Chamber of Commerce to make positive contributions to accelerate change toward responsible management of natural resources in the Philippines. It can start by conveying the experience of its members in creating and carrying out corporate environmental policies and programs. Working collaboratively with the Philippine Chamber of Commerce and Industry and with other environmentally concerned organizations the Chamber can reach a large audience of Philippine businessmen with new ideas and options on corporate environmental policy.

The experience of Chamber members can be presented in the forum of a two or three-day interactive workshop managed by a professional organization experienced in the subject area. It will include speakers from Chamber members to discuss their own programs and how they have evolved. It will also include speakers from the Department of Environment and Natural Resources, Philippine environmental voluntary organizations and Philippine business to discuss their various perspectives on the needs and possibilities here. The format of the workshop will be an interactive one, encouraging the audience to question and learn from the experience of the speakers.

Not all Philippine businesses will implement the changes right away. Most will delay because the pressures here are not yet focused and the economy is still weak. However, a few will take action, some will follow and others will note the ideas for another time when they are more motivated to act.

Some members of the Chamber who have not yet fully developed their own policies will also benefit from the exposure. Others which already have active programs may learn new approaches which are particularly applicable to the Philippine setting.

The Chamber may approach USAID to fund half of the workshop costs from the Enterprise in Community Development Program, stressing that a principal thrust of the workshop will be to describe and encourage private enterprise participation in community development programs for all purposes, including sound resource management and environmental rehabilitation.

Some Chamber corporate members, especially those with active environmental programs to show, may be willing to underwrite part of the cost of the workshop. A fee will be charged for participation to cover the balance of costs. However, the participation fee should be kept below P1,000, preferably less, in order to encourage wide participation.

The proposed workshop can be the first step in a continuing Chamber program of actions to help Philippine business to cooperate in better resource management. They can thereby guarantee the long-term sustainable use of the Philippine resource base for all parties, including the members of the Chamber and others in the foreign and domestic business community.

A PROPOSED PROGRAM TO PROMOTE PARTICIPATION OF THE PRIVATE SECTOR IN INVESTMENT IN NATURAL RESOURCE MANAGEMENT

The Department of Environment and Natural Resources is on the threshold of redefining natural resource management in the Philippines. To do so, DENR needs the active participation of all sectors of the economy. It must redirect priorities, policies, programs and specific projects to create immediate economic opportunities as part of a strategy to maintain, enhance and restore the productivity of the natural resource base of the Philippines.

These changes will result in a practical application of "sustainable development" through the creation of new industries and jobs in resource stewardship: a new way to do business successfully and continuously in the Philippines.

DENR must leverage its resources by becoming a proactive development organization. DENR can thereby not only induce compliance with environmental regulations, it can create new self-sustaining ventures which will achieve its objectives while also generating income for DENR and the private sector participant. DENR will thus lead the way to a new definition of resource management, complementing its regulatory function by promoting new investment and even new industries which will support sustainable management of the natural resources of the Philippines.

A. The Potential

Worldwide the private sector, including private corporations, is increasingly adopting new policies as environmentally responsible world citizens. Many corporations are spending their own resources to achieve objectives of sustainable natural resource management. In doing do they have found innovative ways to use less resources, to replenish damaged resources, to replace toxic substances and to turn pollutants into profitable products. Almost invariably they find that is also good business to be responsible corporate citizen.

DENR must encourage and assist Philippine industry to join this trend by incorporating sustainable resource management as a mainstream part of corporate policy and production processes. Environmental concerns must no longer treated as a costly afterthought. In the more developed countries most corporations have already made this transition, going beyond regulatory compliance to take positive actions to correct adverse impacts and to improve economic opportunity and the human environment. The private sector is the source of much of the environmental impacts, and it also holds the potential solution to the problems.

There are major economic development and commercial business opportunities which DENR can help private sector to realize. Coordinating the regulatory requirements skillfully with selective incentives, DENR can tap the considerable financial resources and the enormous goodwill and shared interests of the private sector which are often obscured by confrontation.

Internal donors, lenders and financial guarantors are increasingly expressing a requirement for environmentally responsible projects and corporate policies, and a strong preference for those projects and ventures which have positive natural benefits. A growing number of venture capital funds and investment trusts are restricted to new or existing ventures which are judged environmentally responsible. Scarce financial resources are therefore increasingly focused toward both public and private ventures which are part of the solution to world resource problems.

B. The Program

In order to encourage the application of these newly available resources of corporations, donors and financiers toward environmentally productive ends in the Philippines, DENR must take a proactive role to establish an integrated program strategy and to design and initiate a series of implementing projects. The program will include joint public-private sector undertakings as well as information and facilitation to actions to bring about the physical and financial infrastructure which will allow private corporations both to comply with the law and to go the next step to take a responsible role in constructive actions.

The proposed program is a DENR-wide effort, involving may organizational elements in a coordinated effort. As an important element of the program DENR may utilize the Natural Resources Development Corporation (NRDC) whose purpose is to work with the private sector and which mandate to invest in new ventures. It will refocused to accomplish the objectives of a program of expanded private sector investment in management of natural resources, broadening its role beyond the current forest and mineral extractive projects.

DENR will expand the business development group of NRDC and enhance their ability to assess new ventures for operational and financial viability. The group will shift its basic orientation from reviewing unsolicited proposals to one of generating business concepts to achieve an economic development strategy that incorporates natural resource productivity.

The new program will include identification and promotion of new business ventures with a direct environmental benefit, as well as seminars, workshops, publications and other forms of information dissemination, targeted specifically at industry and coordinated with the on-going information programs of Environmental Management Bureau (EMB). Other important program elements may include a Renewable Resource Investment Fund, very successfully implemented in the State of California to marshall public and private resources for long-term investment in resource management. The program may also establish a Philippine Conservation Corps which will support public and private sector resource rehabilitation efforts while producing important social benefits.

Collectively, the diverse elements of the program will form a new integrated approach to leverage DENR resources in achieving its objectives through cooperation and participation of the private sector. Above all, DENR will take a proactive role as an animating force for new business ventures and new private sector related programs.

The principal argument for the proposed program is that more can be accomplished by cooperative public-private efforts that by regulatory confrontation alone. The enforcement capability of the Philippines is limited. More important, only the voluntary participation of the private e sector can make available the enormous resources required to correct past abuses and to create the long-term investments in proper management of natural resources needed to arrest continued erosion of the resource base.

The specific intent of the proposed program is to create through a combination of regulatory, public and peer pressure and enhanced opportunity for compliance a setting in which the private sector will find it desirable, both to comply with the national environmental regulations and to undertake projects and new business ventures which will make a positive contribution to sustainable management of natural resources.

The program to produce this will have three main aspects. The first to increase pressure from the regulatory program, seeking support form NGOs and business associations in monitoring and producing peer pressure for compliance, and facilitating compliance by rationalizing the regulatory program and presenting it in a clear and understandable format.

The second aspect is to bring peer and public pressure for compliance and positive contributions, such as through public information programs and through public forum where managers of pollution industries can meet the people affected by their activities and vice versa.

The third aspect is to create the infrastructure needed for compliance -- e.g., a hazardous waste disposal facility or a Philippine Conservation Corps to undertake environmental rehabilitation work -- by identifying and promoting new investment and project opportunities.

In essence the proposed program will be base on the successful experience of the "greening" of corporations in North America and Europe, and it will create a new environment in which the same can happen in the Philippines.

C. <u>The Requirement</u>

DENR is primarily a regulatory agency and has limited practical experience in interacting cooperatively with the private sector. DENR professional staff have little experience with the technical, financial and organizational requirements to mount an expanded program of joint public-private sector efforts. Their experience is almost exclusively in mineral and timber projects and in the review proposals, not in the skills required to identify diverse new business opportunities and to mount and sustain an expanded private sector program.

The DENR needs expert assistance to determine the best mix of actions to include in an overall strategy, how to evaluate the resources required, how to find those resources, and with what emphasis and priority proceed. These are the elements of a strategy and an implementation program which DENR will establish in order to secure program funding and carry out a successful course of action.

The DENR needs assistance in the early phase of the program in training its professional staff, in expert advice on specific business ventures, in conducting workshops and seminars and in contacting international and multinational donors, corporate and foundation participants, supporters and investors.

A wealth of experience is available from the transition to private sector participation which has already occurred in the more developed nations. To design the program strategy and implementing projects and to get the program underway DENR needs the assistance of experienced professionals who have first-hand practical knowledge of how the transition was accomplished elsewhere and understand the operation of the private sector in developing nations such as the Philippines.