Journal of Philippine Development
Number 38, Volume XXI, Nos. 1 & 2, First & Second Semesters 1994

ADJUSTING TO THE NEW TRADE AND ENVIRONMENT PARADIGM: THE CASE OF THE PHILIPPINES*

Ponciano Intal, Jr. and Paul Quintos

INTRODUCTION

The story of the Philippine environment during the past two decades is one of growing stress and resource degradation that has recently forced the Philippine polity and society to come to grips with the problem. Poverty, population pressure, unsatisfactory economic policies and performance, poor environment policies and implementation, and natural disasters underpin the worsening environmental situation. This paper seeks to contribute to a deeper understanding of the issue of sustainable development in the country by exploring the linkage between environment and trade both at home and internationally from the perspective of the Philippines.

The paper is divided into six sections. Section two discusses the interaction between the economy and the environment and natural resource sector. Section three examines the impact of cost internalization on the industry incentive structure and on the international competitiveness of (selected) industries. Section four uses a simulation model to determine the likely environmental impact of trade liberalization. Section five discusses the growing clamor for environmental regulation abroad and its implications on Philippine trade. The conclusions and policy implications of the paper are presented in section six.

* This is largely taken from Chapters 1, 2 and 7 of Intal et al. "Trade and Environmental Linkages: The Case of the Philippines."

ECONOMY-ENVIRONMENT INTERACTION

Trade impacts on the environment as it influences economic activity. Specialization resulting from trade heightens the scale of economic activity; environmental degradation is exacerbated in this process when there are market failures and a failure to internalize the environmental costs of production and/or consumption. In the Philippines, the rising resource and environmental stress during the past two decades went hand in hand with the "stop-go" and comparatively poor economic growth in the country. The dissociation between scarcity and price and between benefits and costs in the environment and natural resource sector likewise meant that the weaknesses in economic governance had a magnified effect on the environment and natural resource sector in terms of incentives to rent seeking, increased population pressure on open access resources, and, in some instances, even social conflict.

For instance, underpricing and the political economy of logging are the main reasons for the fast denudation of forests in the country. In the Philippines, government rent capture as a ratio of potential rent in logging during the 1970s was less than 10 percent. This contrasts with 33 percent in Indonesia and 83 percent in Sabah, Malaysia (Panayotou 1993a: 75). Because of the tremendous private fortunes that can be generated from logging, the granting of timber licenses was strongly determined by political influence and considerations; in addition, illegal logging was abetted by powerful political and military officials (Sajise et al., 1992). As a result, the institutional mechanisms and regulation for forest protection and reforestation were ineffective and/or poorly implemented. Forest fires, population pressure from the lowlands, and the shift to agriculture accelerated and aggravated the process of forest denudation in the country.

The increased population pressure from the lowlands reflected the unsatisfactory growth of employment creation in the lowlands in the face of relatively high population and labor force growth rates. Given insufficient employment opportunities in industry, agriculture and services in the lowlands, the open access uplands became an important refuge for subsistence

farming. While estimates of the total upland population vary widely, there is a consensus that the numbers have risen substantially during the past two decades. Moreover, the rate of upland migration appears to have accelerated during the crisis period of the early and mid-1980s. There are also indications that population pressure on coastal, artisanal fisheries intensified during the crisis years of the early 1980s (Cruz and Repetto 1992: 47-50).

The country's macroeconomic and industrial policies during the 1960s and 1970s were central to the unsatisfactory job creation in industry and agriculture. There was a net transfer of resources out of agriculture during those two decades (Intal and Power 1990), thereby discouraging private investments especially in export agriculture. At the same time, the manufacturing sector turned more capital-intensive and (imported) material-intensive during the 1970s, resulting in the faster deterioration of total productivity in the sector during the decade (Hooley 1985). The failure to direct industrial development according to the country's evolving comparative advantage meant that the Philippines had to rely more on the resource-intensive sectors for foreign exchange during the latter 1960s and the 1970s. Given the underpricing of natural resources extraction and the poor implementation of resource protection measures, the country's renewable resources (i.e., forests, fish) were effectively "mined" beyond sustainable levels.

Rent seeking, uncertain tenure rights and the heavy involvement of political, military and other government officials in forestry gave rise to social conflict in a number of instances. Most of the social conflicts involved actual and potential displacements and deprivation of sources of livelihood of cultural communities from their ancestral lands because of logging concessions, illegal logging and the construction of hydroelectric dams. Some of the cultural communities turned to communist insurgents during the 1970s and early 1980s to protect themselves against unpopular logging concessionaires and illegal logging in their areas (Sajise et al. 1992: 21). This contributed to the geographical expansion and worsening of the insurgency problem in the country during the 1970s and the early 1980s (Roque and Garcia 1992).

It is clear from the experience of the Philippines that sustainable development requires a more employment-creating economic policy regime and economic growth sustained at a robust rate. At the same time, natural resource and environment management need to be substantially improved. The challenge is in minimizing conflicts between environmental protection and economic growth. Indeed, the ideal is to heighten the symbiosis between the economy and the environment in production and consumption aimed at improving the quality of life, equitably distributing (among social classes) opportunities for income generation, and increasing resources for resource regeneration and environmental protection.

In reaction to the economic crisis of 1983-85, the heightened pressure from the international donor community, and the economic success of the more export-oriented economies in Northeast and Southeast Asia, the Philippines began to earnestly shift its trade, industrial, investment, and macroeconomic policy regime during the past few years towards an economy that is more outward-oriented and macroeconomically stable. Thus, tariff rates have been reduced, most of the nontariff barriers have been eliminated and transformed into tariffs, the foreign exchange market has been liberalized, the foreign equity restrictions on Philippine industries have been eased up, and competition policies in the utilities sector have been strengthened. The government's fiscal situation remains fragile, however, and can therefore threaten macroeconomic stability. Nevertheless, the government is in the process of addressing the fiscal problem in large part through executive actions to improve tax administration, proposed legislative measures to increase the tax revenue effort, i.e., the overall tax revenue to GNP ratio, and privatization so as to raise the nontax revenue effort.

Cross-country studies (e.g., World Bank, 1987: ch. 5) show that outward-looking developing countries experienced higher export and economic growth rates, utilized scarce capital resources more efficiently, and generated more employment in manufacturing from the 1960s to the early 1980s than developing countries that pursued strongly inward-oriented development strategies (Table 1). Morover, as exemplified by the newly industrialized economies of Asia, the strongly outward-oriented countries

also succeeded in significantly reducing their incidences of poverty over the past two and a half decades. Considering that poverty, the lack of employment opportunities in industry, and the "stop-go" overall economic performance contributed substantially to the resource and environmental degradation in the Philippines, the country's current shift towards economic outwardness and export orientation can contribute significantly towards addressing important sources of resource depletion and environmental degradation in the Philippines. (For example, domestic and municipal wastes are the main sources of water pollution; higher economic growth that reduces poverty, increases per capita income and raises government revenues can lead to improvements in sanitation and waste disposal services that will eventually reduce water pollution.)

Nevertheless, the experiences of the Northeast Asian tiger economies suggest that high economic growth and even faster export growth can result in serious environmental pollution. Thus, based on the "Kuznet's curve" or inverted *U* hypothesis (Panayotou 1993b), the pollution problem of the Philippines can be expected to worsen as per capita income increases before being significantly reduced at sufficiently high per capita income levels. The "Kuznet's curve," which is drawn from cross-country comparisons, captures the historically poor environment policies in most countries especially the developing ones; hence, the "curve" is not immutable. The challenge is to improve environment policies in conjunction with an improvement in economic policies so as to shift the "Kuznet's curve" downward at least, i.e., reduce the pollution intensity of production and possibly delink economic growth and pollution. Delinking growth and pollution requires greater efficiency in the use of resource inputs (i.e., reduced resource inputs per unit of output) and a lowering of pollution per unit of output through cleaner technologies and practices. In short, economic openness and export orientation, which underlie the overall strategy for economic growth, necessitate the adoption and implementation of appropriate policies on natural resources, the environment, and investments.

TABLE 1
Comparative Performance of Countries by Trade Regime

	Real GNP growth per capita (%/year)		Growth of manufactured exports (%/year)		Incremental capital output ratio (average ratio)	
	1963-73	1973-85	1963-73	1973-85	1963-73	1973-85
Strongly outward-oriented	6.9	5.9	14.8	14.2	2.5	4.5
Moderately outward-oriented	5.0[a]	1.8[a]	16.1	14.5	2.5	5.0
Moderately inward-oriented	3.9[a]	1.9[a]	10.3	8.5	3.3	6.2
Strongly inward-oriented	1.6	-0.1	5.7	3.7	5.2	8.7

	Growth of real manufacturing value added (%/year)		Share of labor force in industry	
	1963-73	1973-85	1963	1980
Strongly outward-oriented	15.6	10.0	17.5	30.0
Moderately outward-oriented	9.4	4.0	12.7	21.7
Moderately inward-oriented	9.6	5.1	15.2	23.0
Strongly inward-oriented	5.3	3.1	12.1	12.6

[a] Approximate.

Source: 1987 World Development Report, pp. 84-87.

Welfare Analysis of Trade and Environment Policies in a Small Open Economy

The standard welfare analysis of trade and environment in a small open economy (see Anderson 1992) helps crystallize the needed complementarities between economic and environment policies in the drive towards economic openness and export orientation. Specifically, in the presence of environmental externalities and other market failures, the increased efficiency and income from trade liberalization, economic openness and export orientation must be weighed against any negative environmental effects that can be magnified by expanded and intensified economic activity due to increased openness.

The propositions of the standard welfare analysis of trade and environment policies in a small open economy are as follows:

1. *Where the good is an importable*

- If the *negative environmental externality is in the production* of the importable (e.g., chemicals), and if trade liberalization results in increased reliance on imports, then trade liberalization would improve the country's environment and welfare. Moreover, if there is an appropriate production tax (e.g., pollution tax) on the domestic production of the importable or import substitute, the country's environment and welfare would improve further.
- If the *negative environmental externality is in the consumption* of the importable (e.g., oil), and if trade liberalization results in increased imports and consumption, then trade liberalization worsens the country's environment. In this case, an optimal policy mix should include the imposition of an appropriate consumption tax (e.g., oil levy) on the importable, whether domestically produced or imported.

2. *Where the good is an exportable*

- If the *negative externality is in the production of the exportable* (e.g., wood), and trade liberalization results in increased exports and production, then trade liberalization may worsen the country's environment and welfare depending on whether or not the efficiency effects of liberalized trade outweigh the externality effects on the

environment. In this case, the ideal policy is to impose an appropriate production tax (e.g., stumpage fee) on the exportable, whether for the domestic market or for export.

- If the *negative externality is in the consumption of an exportable*, and trade liberalization results in increased exports and reduced domestic consumption, then trade liberalization would contribute to the improvement of the country's environment. Moreover, the imposition of a consumption tax on domestic consumption and on the exportable would reduce further domestic consumption and improve the country's environment and social welfare. Where the exportable is a production input, the higher the domestic price concomitant to the imposition of a consumption tax, the lower would be the effective rate of protection of the consuming industry.

The theory of optimal distortions in international trade shows that in the case where there is an externality or distortion in the economy, the optimal government policy is to intervene directly at the source of the distortion. Thus, for example, if the externality is a production externality, then a move directly aimed at the production externality is the optimal government intervention. Otherwise, additional or by-product distortions result when other intervention measures are resorted to. Specifically, trade taxes or subsidies or quotas result in by-product consumption or production distortions if they are used to address a production or consumption externality, respectively. Thus, trade taxes or subsidies or quotas are less efficient government measures to address production or consumption environmental externalities.

In summary,

- Where there is an environmental cost, either in production or in consumption, it is better to deal directly with it through a production tax or consumption tax irrespective of the trade regime.
- Where there is no domestic policy to internalize environmental costs of production or consumption of tradables (i.e., exportables or importables), a movement towards a freer and more liberal trade

regime may actually worsen the country's welfare. Specifically, where the good is an exportable and the environmental cost is in production, or where the good is an importable and the environmental cost is in consumption, then trade liberalization would worsen the country's environment/natural resources and therefore may end up worsening the country's social welfare if the negative social effects of environmental degradation outweigh the gains from trade.

- Even when efficiency gains are outweighed by the negative environmental effects of liberalized trade, the appropriate intervention is not trade-restriction per se but cost internalization. Trade taxes-cum-subsidies is a less efficient way of internalizing externalities than direct production and consumption taxes (or subsidies) because of the attendant by-product distortions in production or consumption arising from the imposition of trade taxes-cum-subsidies.
- The analysis brings to the fore the importance of appropriate environmental policies in order to ensure that negative environmental effects of trade and production are adequately addressed.
- Given an appropriate internalization of environmental effects either in production or consumption, a policy move towards freer or liberalized trade will improve the country's environment and welfare by raising efficiency and income as well as increasing the demand for and the wherewithal to finance environmental protection.

COST INTERNALIZATION, COMPETITIVENESS AND INDUSTRY INCENTIVE STRUCTURE

Economic theory dictates that the full social costs (including the environmental costs) of economic activity should be internalized by private agents. Whatever the resulting environmental damage, if any, would then be "optimal" since all the costs and benefits are accounted for in the decision

making of the different agents. Moreover, to establish the proper incentive-structure, ideally, the agent engaged in the activity that is generating the externality must be the one to bear these costs, i.e., the polluter's pay principle.

The recently concluded Environment and Natural Resource Accounting Project (ENRAP Phase II) provides the most comprehensive and internally consistent set of estimates of the value of "waste disposal services" of the environment provided to the economy's industries, households and government sectors (de los Angeles and Peskin 1994). Ebarvia (1994) and Orbeta (1994) summarize the environmental damages from soil erosion and sedimentation as well as the abatement costs of water and air pollution should the different industries reduce their current rate of pollution emission by 90 percent.

The project results reveal that the major sources of environmental damage and pollution are the government, households, forestry and agricultural sectors and not the industrial sector as is commonly believed. Households, for example, account for 48 percent of BOD discharges and 19 percent of particulate matter emissions; public administration and defense accounts for 38 percent of suspended solids discharged because of urban run-off arising from poor drainage systems and soil erosion from public lands. The large contribution of forestry to water pollution reflects the off-site damages from soil erosion and sedimentation caused by logging activities. The large abatement costs in agricultural crops represent the cost of shifts in farming systems in order to minimize soil erosion. The major losers from the ill effects of urban and surface run-off and sedimentation are the fisheries sector, tourism industry and irrigation (Ebarvia 1994). In the industrial sector, the country's major source of pollution is the food, beverages and tobacco sector; this is not surprising because the sector, which is a water polluter, has the largest share of total manufacturing value added. For air pollution, the major sources are the household sector, electricity generation, transportation services and the food, beverages and tobacco sector (Table 2).

The ENRAP II estimates of abatement costs could be used as a proxy measure of environmental externalities for examining the possible impact

TABLE 2
Prospective Abatement Costs
(In thousand pesos, 1988)

PSIC	Industry and process	Prospective abatement costs		
		Water	Air	Total
AGRICULTURE, FORESTRY AND FISHERY		8,331,401	17,134	8,344,542
11	Agri crops production	1,588,721	9,276	1,597,997
12	Livestock, poultry and other animal products	1,059,720	2,705	1,062,425
13	Agricultural services	n.e.	756	n.e.
14	Fishery	n.e.	3,155	n.e.
15	Forestry	5,682,960	1,242	5,684,120
16	Hunting, trapping and game operation	n.e.	n.e.	n.e.
MINING AND QUARRYING		12,448	127,853	140,301
21	Metallic ore mining	12,375	88,210	100,585
22	Nonmetallic mining and quarrying	73	39,643	39,716

TABLE 2 (continued)

PSIC	Industry and process	Prospective abatement costs		
		Water	Air	Total
MANUFACTURING		513,835	732,117	1,245,952
31	Manufacture of food, beverages and tobacco	430,545	381,620	812,165
32	Textile, wearing apparel and leather industries	43,805	40,443	84,248
33	Manufacture of wood and wood products, including furniture and fixtures	6,188	57,108	63,296
34	Manufacture of paper and paper products, printing and publishing	15,401	46,224	61,625
35	Manufacture of chemical and chemical, petroleum, coal, rubber and plastic products	15,164	52,633	67,797
36	Manufacture of nonmetallic mineral products	392	58,582	58,974
37	Basic metal industries	292	54,360	54,652
38	Manufacture of fabricated metal products, machineries and equipment	2,048	32,967	35,015
39	Other manufacturing industries	n.e.	8,180	8,180
ELECTRICITY, GAS AND WATER		23,921	481,508	505,429
41	Electricity	23,693	447,251	470,944
42	Gas and steam	228	n.e.	228
43	Waterworks and supply	n.s.	34,257	34,257

TABLE 2 (continued)

PSIC	Industry and process	Prospective abatement costs		
		Water	Air	Total
CONSTRUCTION		n.e.	14,987	14,987
50	Construction	n.e.	14,987	14,987
WHOLESALE AND RETAIL TRADE		4,443	65,909	70,352
61	Wholesale trade	4,443	12,848	17,291
62	Retail trade	n.e.	53,061	53,061
TRANSPORTATION, STORAGE AND COMMUNICATIONS		n.s.	450,562	450,562
71	Transportation services	n.s.	324,833	324,833
72	Storage and warehouse	n.s.	46,040	46,040
73	Communication	n.s.	79,689	79,689

TABLE 2 (continued)

PSIC	Industry and process	Prospective abatement costs		
		Water	Air	Total
FINANCING, INSURANCE, REAL ESTATE AND BUSINESS SERVICES		n.e.	33,798	33,798
81	Banking institution	n.e.	7,333	7,333
82	Financial intermediaries	n.e.	1,123	1,123
83	Insurance	n.e.	2,194	2,194
84	Real estate	n.e.	16,389	16,389
85	Business services	n.e.	6,759	6,759
COMMUNITY, SOCIAL AND PERSONAL SERVICES		1,824,102	110,314	1,934,416
91	Public administration and defense	1,804,440	81,724	1,886,164
92	Sanitary and similar services	n.s.	n.e.	o
93	Education services	n.s.	1,805	1,805
94	Medical, dental, other health and sanitary services	13,895	1,805	15,700
95	Other social and related community services	n.e.	1,805	1,805
96	Recreational and cultural services	n.e.	1,805	1,805
97	Personal and household services	2,010	1,805	3,815

TABLE 2 (continued)

PSIC	Industry and process	Prospective abatement costs		
		Water	Air	Total
98	Restaurants and hotels	3,757	1,805	5,562
99	International organization and other extra-territorial bodies	n.s.	17,760	17,760
HH	Household sector	3,638,510	1,282,737	4,921,247
	Nature sector	n.e.	n.e.	n.e.
TOTAL		**14,342,660**	**3,316,919**	**17,665,579**

n.e. Not estimated
n.s. Not significant
Source: ENRAP II preliminary estimates as of 28 March 1994.

of cost-internalization on Philippine industries.[1] Based on the ENRAP II estimates, the sectors/industries that have the highest pollution abatement cost per unit of output are forestry (22.9 percent), the government sector (i.e., public administration and defense, 10 percent), poultry (6.2 percent), livestock (2.5 percent), agricultural crops production (3.6 percent), and mining (1.5 to 2.8 percent). In contrast, most manufacturing industries have ratios of pollution abatement costs to total output (i.e., "pollution intensity") of less than 0.5 percent (Table 3).

The high "pollution/environmental damage intensities" of agricultural crops, livestock and poultry are somewhat mitigated by the widely dispersed nature of production and by their locational focus in the countryside rather than in the densely populated urban areas. Small-scale and dispersed (say, backyard) livestock/poultry raisers may not pose serious environmental damage; they may even benefit the surrounding environment with manure-fertilizer. Nevertheless, given the fragility of the Philippine agroecological system (i.e., the preponderance of small islands and hilly areas; vulnerability to heavy downpours during typhoons), the country needs to shift to less erosive crops and/or to invest in soil erosion preventive agricultural technologies (e.g., terracing). For the metallic ore mining sector, the environmental damages are much greater than the abatement costs, indicating that it is socially imperative to be stricter on mining firms with respect to pollution control. Perhaps the most compelling of all is forestry where investments in reforestation are urgent and its effects are both resource-regeneration and lower environmental damages resulting from forestry activities.

The estimates of pollution/environmental damage intensities by de los Angeles et al. are national-level estimates. Environment problems have strong locational variations. For instance, water pollution is far more serious in some areas of the country (say, Manila) than in others (e.g., Western

1. These are estimates of the costs (annualized capital costs plus operating and maintenance costs) of pollution control devices necessary in reducing existing air emissions and water effluents by 90 percent, by industry sector. In this case, the "costs" internalized pertain to abatement costs rather than the cost of damages.

TABLE 3
Philippine Industries, Ranked by Pollution Intensity, 1988

PSIC	Sector description	Percent share of abatement cost to output
15	Forestry	22.8530
91	Public administration and defense	9.9900
122	Poultry and poultry products	6.1563
11	Agri crops production	3.5711
229	Other nonmetallic mining and quarrying	2.7900
121	Livestock and livestock products	2.5382
219	Other base metal ore mining	2.1900
712	Road passenger transport	1.6524
72	Storage and warehousing	1.4190
214	Nickel ore mining	1.5400
215	Chromite ore mining	1.5200
211-212	Gold ore mining and other precious metals	1.4800
213	Copper ore mining	1.4600
361	Manufacture of pottery, china and earthenware	1.3756
341	Manufacture of paper and allied products	1.2717
313	Beverage manufacturing	1.1561
363	Manufacture of cement	0.9087
372	Nonferrous metal basic industries	0.7802
331	Manufacture of wood and wood products	0.6745
41	Electricity	0.4942
311-312	Food manufacturing	0.4518
321	Textile manufacturing	0.3917
371	Iron and steel basic industries	0.3447
323-324	Manufacture of leather and leather products	0.2562
351-352	Manufacture of chemicals and plastic products	0.2124
382	Manufacture of machinery except electrical	0.2112

TABLE 3 (continued)

PSIC	Sector description	Percent share of abatement cost to output
81	Banking institution	0.1991
83	Insurance	0.1957
96	Recreational and cultural services	0.1915
84	Real estate	0.1893
61-62	Wholesale and retail trade	0.1771
73	Communication	0.1759
94	Medical, dental, other health and sanitary services	0.1752
43	Waterworks and supply	0.1646
223	Stone quarrying, clay and sand pits	0.1541
95	Other social and related community services	0.1493
97	Personal and household services	0.1477
50	Construction	0.1299
98	Restaurants and hotels	0.1127
82	Financial intermediaries	0.1088
39	Other manufacturing industries	0.1071
342	Printing, publishing and allied industries	0.0983
322	Wearing apparel	0.0977
85	Business services	0.0947
355	Rubber products	0.0942
713	Water transport	0.0924
381	Manufacture of fabricated metal products	0.0861
314	Tobacco manufacturing	0.0798
332	Manufacture and repair of furniture	0.0786
383	Manufacture of electrical machinery, etc.	0.0674
99	International organization and other extra-territorial bodies	0.0629
369	Manufacture of other nonmetallic products	0.0542
384	Manufacture of transport equipment	0.0539

TABLE 3 (continued)

PSIC	Sector description	Percent share of abatement cost to output
93	Education services	0.0503
714	Air transport	0.0231
362	Manufacture of glass and glass products	0.0201
353	Petroleum refineries	0.0151
354	Manufacture of miscellaneous production of petroleum and coal	0.0004
386	Manufacture and repair of metal furniture and fixtures	0.0000

Source: Environment and Natural Resource Accounting Project, Phase II.

Visayas). The same is true with air pollution. All this points up the need for locational differentiation of any fiscal or nonfiscal action by the government to address the problem of environmental degradation. More importantly, the importance of industrial locational policy as a complementary measure to the internalization of environment costs is also highlighted.

It can be argued that the pollution abatement costs examined above only pertain to air emissions and water effluents, thus understating environmental externalities which cover a host of other factors (e.g., biodiversity loss, congestion, aesthetic amenities, etc.). The shortcomings of the ENRAP II estimates notwithstanding, we can use hypothetical environmental costs (in percent of industry output) in order to examine the possible impact of cost-internalization on the effective rates of protection and comparative advantage of (selected) industries where the country currently enjoys comparative advantage.

The ratios of the domestic resource cost (DRC) to the shadow exchange rate (SER) as well as the ratios of the DRC_m (at market rates) to the official exchange rate (OER) for commercial fishery, aquaculture, fish canning, fish drying and other manufacturing, coconut/copra production, forestry, furni-

ture, copper mining, textiles (export), fabric knitting mills (export), and garments (export) are shown in Table 4. They all exceed unity only at very high levels of environmental costs (all greater than 5 percent of output). A DRC/SER < 1 implies social profitability while a DRC_m/OER < 1 implies private profitability or competitiveness. The notable exception is municipal and inland fishing for which unity is reached when environmental costs equal 5 percent of industry output, which is still substantially high considering that the pollution intensity of fishing is negligible. Sawmills and planing mills and paper products, on the other hand, are unprofitable even assuming that there are no environmental externalities associated with their production in the Philippines.

Overall, Table 4 indicates that social and private profitability can be maintained for most of the sectors studied even with an environmental tax of up to 5 percent of output (or more, in the case of a few industries).

Examining the effect of cost-internalization on the industry incentive structure, it is notable that at any given level of environmental cost (EC > 0), cost-internalization (via market-based instruments such as environmental taxes) lowers effective protection for all industries compared to where there is no cost-internalization. This is true for all of the industries examined above. Conversely, in the absence of cost-internalization (i.e., zero environmental tax), effective protection rates increase as environmental costs increase. Given this, industries currently enjoying protection may deem cost-internalization as contrary to their private interests.

It can be seen from Table 4 that cost-internalization reduces effective protection as environmental costs increase for all the export industries in Table 4.By lowering effective protection, environmental policy based on cost-internalization worsens further the already negligible or negative effective rate of protection for many export industries and, thus, increases the disincentive to exporting. This suggests that the imposition of the "polluter pays principle" on the export industry needs to be tied to broader trade-liberalizing reforms, e.g., a significant redirection of the country's trade and tariff regime toward lower industrial protection of the import substituting industries and toward a more realistic exchange rate.

TABLE 4
Some Measures of Protection and Competitiveness of Selected Sectors

	Environ-ment cost (% of output value)	EPR (%) (w/ environment tax = environment cost)	NEPR (%) (w/ environment tax = environment cost)	EPR (%) (environment tax = 0)	NEPR (%) (environment tax = 0)	DRC/SER	DRC/OER
Commercial fishery	0	-0.88	-17.40	-0.88	-17.40	0.36	0.43
	5	-1.89	-18.24	3.95	-13.37	0.43	0.52
	10	-3.01	-19.18	9.28	-8.93	0.50	0.61
	15	-4.26	-20.21	15.18	-4.02	0.57	0.69
	20	-5.64	-21.37	21.75	1.46	0.64	0.78
	30	-8.95	-24.12	37.44	14.54	0.79	0.95
Municipal and inland fishing	0	57.56	31.30	57.56	31.30	0.83	1.01
	5	60.56	33.80	70.13	41.77	1.00	1.22
	10	64.07	36.73	84.87	54.06	1.17	1.42
	15	68.26	40.21	102.41	68.68	1.34	1.62
	20	73.31	44.43	123.63	86.36	1.51	1.82
	30	87.46	56.21	182.96	135.80	1.84	2.23

TABLE 4 (continued)

	Environment cost (% of output value)	EPR (%) (w/ environment tax = environment cost)	NEPR (%) (w/ environment tax = environment cost)	EPR (%) (environment tax = 0)	NEPR (%) (environment tax = 0)	DRC/SER	DRC/OER
Aquaculture and other fishery activities	0	6.48	-11.27	6.48	-11.27	0.72	0.87
	5	5.66	-11.95	12.94	-5.89	0.78	0.95
	10	4.74	-12.72	20.23	0.19	0.85	1.02
	20	2.47	-14.61	38.05	15.04	0.98	1.18
	30	-0.58	-17.15	62.07	35.06	1.11	1.34
Fish canning	0	19.50	-0.42	19.50	-0.42	0.63	0.77
	5	19.41	-0.49	40.07	16.72	0.81	0.98
	10	19.29	-0.59	69.20	41.00	0.99	1.19
	15	19.10	-0.75	113.63	78.02	1.16	1.40
	20	18.78	-1.02	189.70	141.42	1.34	1.61
	30	15.76	-3.54	906.49	738.74	1.69	2.04
Fish drying, smoking, and mfg. of other seafood products	0	17.14	-2.38	17.14	-2.38	0.69	0.85
	5	16.74	-2.72	33.61	11.34	0.84	1.03

TABLE 4 (continued)

	Environment cost (% of output value)	EPR (%) (w/ environment tax = environment cost)	NEPR (%) (w/ environment tax = environment cost)	EPR (%) (environment tax = 0)	NEPR (%) (environment tax = 0)	DRC/SER	DRC/OER
	10	16.20	-3.16	55.47	29.56	0.99	1.21
	15	15.46	-3.78	85.88	54.90	1.14	1.39
	20	14.36	-4.70	131.09	92.58	1.29	1.56
	30	9.01	-9.16	349.94	274.95	1.58	1.92
Coconut/copra	0	-0.19	-16.83	-0.19	-16.83	0.68	0.83
	0.6	-0.30	-16.91	0.32	-16.40	0.69	0.84
	5	-1.09	-17.57	4.24	-13.14	0.73	0.89
	10	-2.07	-18.39	9.08	-9.10	0.77	0.94
Production of crude coconut oil, copra cake and meal	0	-1.54	-17.95	-1.54	-17.95	0.76	0.92
	0.6	-1.89	-18.24	0.03	-16.65	0.78	0.95
	5	-4.79	-20.65	13.27	-5.61	0.94	1.14
	10	-9.17	-24.31	33.33	11.11	1.13	1.36
Forestry	0	-0.81	-17.34	-0.81	-17.34	0.57	0.81
	5	-2.19	-18.49	5.75	-11.87	0.66	0.91
	10	-3.76	-19.80	13.25	-5.63	0.74	1.01

TABLE 4 (continued)

	Environment cost (% of output value)	EPR (%) (w/ environment tax = environment cost)	NEPR (%) (w/ environment tax = environment cost)	EPR (%) (environment tax = 0)	NEPR (%) (environment tax = 0)	DRC/SER	DRC/OER
	15	-5.57	-21.31	21.88	1.57	0.83	1.11
	20	-7.68	-23.07	31.94	9.95	0.91	1.21
	25	-10.17	-25.15	43.82	19.85	1.00	1.32
Sawmills and planing mills	0	-1.38	-17.82	-1.38	-17.82	1.62	1.96
	2	-2.37	-18.64	3.20	-14.00	1.71	2.07
	5	-4.05	-20.04	10.92	-7.56	1.84	2.24
Veneer and plywood	0	-2.17	-18.48	-2.17	-18.48	0.92	1.12
Paper and Paper Products	0	77.80	48.17	77.80	48.17	1.38	1.67
Manufacture and repair of rattan furniture including upholstery	0	-1.55	-17.96	-1.55	-17.96	0.49	0.60
Manufacture and repair of wood furniture, including upholstery	0	2.11	-14.91	2.11	-14.91	0.65	0.80
Copper mining	0.0045	-4.20	-20.17	-4.19	-20.16	0.70	0.85

TABLE 4 (continued)

	Environment cost (% of output value)	EPR (%) (w/ environment tax = environment cost)	NEPR (%) (w/ environment tax = environment cost)	EPR (%) (environment tax = 0)	NEPR (%) (environment tax = 0)	DRC/SER	DRC/OER
Textile	0					7.08[a]	8.67[a]
						0.85[b]	1.04[b]
(spinning, weaving, texturizing and finishing)	0.67	48.99	24.16	51.26	26.05	7.29[a]	8.91[a]
						0.87[b]	1.07[b]
Fabric knitting mills	0					1.48[a]	1.80[a]
						0.75[b]	0.80[b]
	0.38	37.01	14.18	38.14	15.12	1.50[a]	1.83[a]
						0.76[b]	0.81[b]
Garments	0	0	-16.67	0	-16.67	0.53	0.65

[a]average
[b]export
Source of Data: 1988 Input-Output Table (230 x 230 commodity x commodity).

TRADE LIBERALIZATION AND THE PHILIPPINE ENVIRONMENT

Trade liberalizing reforms are expected to impact on the environment by changing the relative effective rates of protection of the different industries which have varying degrees of associated environmental externalities. In the case of the Philippines, trade liberalization across the board can be expected to encourage exportable industries including nature-based industries such as forestry, mining and agriculture which are associated with large off-site environmental consequences. Moreover, liberalizing trade (along with currency depreciation) also favors those sectors where the country enjoys comparative advantage — which includes not only the nature-based industries already mentioned but also sectors such as food, beverages, tobacco and wood products which are relatively pollutive.

A simple multi-industry partial equilibrium simulation model is used in this paper to provide some indication of the likely direction of changes in economic structure and of the environmental impact of trade liberalization (i.e., tariff reduction with or without induced changes in the real exchange rate). The simulation model, which builds upon the model developed by Chunglee for the Philippine Tariff Commission, links changes in industry outputs to changes not only in interindustry effective rates of protection but in the real exchange rate as well. The model is static and assumes fixed input-output ratios and constant factor prices. As such, the model cannot capture the dynamic effects of investments that can arise from trade liberalization. Moreover, shifts in factor proportions due to changing factor prices and relative prices are not considered. Thus, essentially, the Chunglee simulation captures the impact effects of trade liberalization. Because of the limitations of the model, the simulation results are meant primarily to give some indications of the direction of change in the economy and of the probable impact on the environment.

The results of the simulation appear intuitively reasonable (Table 5). An across-the-board reduction in tariffs by 50 percent or the institution of a uniform 15 percent effective rate of protection (EPR) across all sectors

TABLE 5
Trade Regimes and the Environment
(In percent)

1983 1-0	Description	Change in output				Pollution/damage intensity[e]				
		I[a]	II[b]	III[c]	IV[d]	I	II	III	IV	base
03-19	Agriculture	-1.89	9.95	3.14	18.05	3.5711	3.5711	3.5711	3.5711	3.5711
19-20	Fishing	-0.90	11.18	5.42	20.97	0.0000	0.0000	0.0000	0.0000	0.0000
21	Logging	8.24	22.59	26.46	47.92	22.8534	22.8534	22.8534	22.8534	22.8534
22	Other forestry activities	-9.15	0.91	-13.54	-3.30	5.1093	5.1093	5.1093	5.1093	5.1093
23	Gold and other precious metals	1.82	14.58	11.69	29.00	1.4800	1.4800	1.4800	1.4800	1.4800
24	Copper ore	3.15	16.23	14.74	32.00	1.4800	1.4600	1.4600	1.4600	1.4600
25	Other metallic mining	3.28	16.40	15.05	33.31	1.7300	1.7300	1.7300	1.7300	1.7300
26	Sand, stone and clay quarrying	-5.04	6.03	-4.09	8.79	1.6000	1.6000	1.6000	1.6000	1.6000
27	Other nonmetallic mining and quarrying	-4.43	6.79	-2.69	10.59	2.7900	2.7900	2.7900	2.7900	2.7900
28-45	Food manufacturing	-7.08	10.88	-4.28	16.97	0.4518	0.4518	0.4518	0.4518	0.4518
46-47	Beverage	-6.72	11.32	-3.46	18.01	1.1561	1.1561	1.1561	1.1561	1.1561
49-50	Tobacco	-10.89	6.12	-13.05	5.73	0.0798	0.0798	0.0798	0.0798	0.0798
51-53	Textile manufacturing	-20.38	-5.70	-34.87	-22.21	0.3917	0.3917	0.3917	0.3917	0.3917
54-55	Garments and footwear	0.00	19.70	12.00	37.81	0.0977	0.0977	0.0977	0.0977	0.0977

TABLE 5 (continued)

1983 1-0	Description	Change in output				Pollution/damage intensity[e]				
		I[a]	II[b]	III[c]	IV[d]	I	II	III	IV	base
56-58	Wood and wood products	-5.42	12.94	-0.47	21.84	0.6745	0.6745	0.6745	0.6745	0.6745
59-60	Paper and allied products	-33.80	-22.42	-65.74	-61.73	1.2717	1.2717	1.2717	1.2717	1.2717
61	Publishing and printing	-36.82	-26.19	-72.69	-70.64	0.0983	0.0983	0.0983	0.0983	0.0983
62	Leather and leather products	-2.02	17.18	7.35	31.88	0.2562	0.2562	0.2562	0.2562	0.2562
63-65	Rubber products	-33.27	-21.76	-64.52	-60.17	0.0942	0.0942	0.0942	0.0942	0.0942
66-75	Chemicals and plastic products	-23.29	-9.33	-41.56	-30.78	0.2124	0.2124	0.2124	0.2124	0.2124
76	Products of petroleum, coke and coal	-25.08	-11.56	-45.68	-36.05	0.0151	0.0151	0.0151	0.0151	0.0151
77	Cement	-14.63	1.46	-21.65	-5.28	0.9087	0.9087	0.9087	0.9087	0.9087
78	Glass and glass products	-20.39	-5.71	-34.89	-22.24	0.0201	0.0201	0.0201	0.0201	0.0201
79	Other nonmetallic manufactures	-14.60	1.50	-21.58	-5.19	0.0542	0.0542	0.0542	0.0542	0.0542
80	Primary iron and steel products	-17.74	-2.41	-28.80	-14.43	0.3447	0.3447	0.3447	0.3447	0.3447
81	Nonferrous basic metals	-3.61	15.20	3.69	27.18	0.7802	0.7802	0.7802	0.7802	0.7802
82	Fabricated metal products	-33.15	-21.62	-64.26	-59.84	0.0861	0.0861	0.0861	0.0861	0.0861
83	Machinery and equipment except electrical	-43.92	-35.04	-89.01	-91.54	0.2112	0.2112	0.2112	0.2112	0.2112

TABLE 5 (continued)

1983 I-O	Description	Change in output				Pollution/damage intensity[e]				
		I[a]	II[b]	III[c]	IV[d]	I	II	III	IV	base
84-89	Electrical machinery, etc.	-10.67	6.40	-12.54	6.38	0.0674	0.0674	0.0674	0.0674	0.0674
90-91	Transport equipment	-22.51	-8.35	-39.77	-28.48	0.0539	0.0539	0.0539	0.0539	0.0539
92	Furnitures and fixtures, primarily of wood	0.04	19.74	12.08	37.92	0.1071	0.1071	0.1071	0.1071	0.1071
93	Furnitures and fixtures, primarily of metal	-29.70	-17.31	-56.31	-49.66	0.0000	0.0000	0.0000	0.0000	0.0000
94-95	Other manufactures	31.78	59.30	85.10	131.43	0.1071	0.1071	0.1071	0.1071	0.1071
96	Miscellaneous manufactures, n.e.c. and scrap	-29.13	-16.61	-55.01	-48.00	0.0000	0.0000	0.0000	0.0000	0.0000
03-96	ALL	-9.88	5.49	-11.88	5.09	1.7988	1.7480	2.0443	2.0043	1.5823

[a]Case I: Post Trade Reform Output given a 50% decrease in EPR from its 1985 levels, given fixed exchange rate.
[b]Case II: Post Trade Reform Output given a 50% decrease in EPR from its 1985 levels, given flexible exchange rate.
[c]Case III: Post Trade Reform Output given a uniform EPR of 15% across all sectors, from its 1985 levels, given fixed exchange rate.
[d]Case IV: Post Trade Reform Output given a uniform EPR of 15% across all sectors, from its 1985 levels, given flexible exchange rate.
[e]Ratio of abatement costs or environmental damage costs to sector output.
Sources: 1983, 1988 I-O Tables, NSO; ENRAP II.

without a corresponding change in the real exchange rate leaves much of Philippine agriculture and the manufacturing sectors vulnerable to import competition. Specifically, those industries where the Philippines remains internationally uncompetitive (i.e., the more capital intensive import substituting industries) are the ones that could be hit hardest by the tariff reduction — e.g., paper and plastics, chemicals, machinery, basic metal and metal products, and nonmetallic mineral products.

However, when the tariff reform (50 percent reduction in EPR or a uniform 15 percent EPR) is accompanied by real peso depreciation, the overall output effect is positive. The industries/sectors with the largest positive output effects are forestry, wood furniture, mining, and labor-intensive manufactures such as garments and leather products. These sectors/industries in which the Philippines has comparative advantage generally have lower than average effective rates of protection. The heavily protected import substituting industries like paper, chemicals, and basic metals are adversely affected by the tariff reduction despite the induced real peso depreciation. Nevertheless, the negative output and income effects on the import substituting industries are minimized under a flexible exchange rate regime; this reflects the protective effect of a real peso depreciation.

The simulation results also indicate that trade liberalization raises the national average "pollution intensity" of production. This arises from the reallocation of output towards logging, mining, and agriculture which have large off-site environmental damages and therefore relatively higher abatement cost to output ratios. Even within the manufacturing sector, there appears to be a reallocation of output towards the industries with higher pollution intensities (e.g., food processing, beverages, wood products).

In sum, the available evidence suggests a possible trade-off between trade liberalization and its implied gains in efficiency and welfare, on the one hand, and environmental protection, on the other. This points up the importance of putting in place cost internalization and complementary environmental and natural resource management policies in conjunction with the trade liberalization reform process. It must be pointed out, though, that the simulations do not consider the positive dynamic effects on the

environment of increased competition resulting from freer trade, e.g., state-of-the-art, resource-efficient technology that brings its own ecological gains. Furthermore, liberalizing trade can also help ease population pressure on the country's dwindling (fishery and forestry) resource-base by sourcing more of the country's needs from abroad. At the same time, trade liberalization exerts competitive pressures for greater efficiency on downstream processing industries and thereby helps conserve scarce resources.

FOREIGN ENVIRONMENT REGULATIONS AND PHILIPPINE TRADE

The preceding discussion highlights the importance of economic openness and strong environmental policy for the Philippines (and other similarly-situated developing countries). It is clear that such policy initiatives at the national level need to be complemented by international efforts toward a much more open international economy and the prevention of the occurrence of "environment-managed trade" (Stevens 1993). For the Philippines, economic openness means that the country will export or import according to its evolving comparative advantages (disadvantages). Protectionist policies in the export markets (especially in the developed countries) against products where the Philippines has comparative advantage will subvert ongoing efforts toward greater economic openness. In this regard, the recently concluded Uruguay Round will contribute toward furthering economic openness in both developed and developing countries and thereby help provide the international trade regime that is complementary to economic liberalization efforts in the Philippines.

The Uruguay Round negotiations did not tackle fully the issue of the environment in the various working groups. Already there is growing pressure for the use of trade sanctions to influence the environment policies of other countries. At the heart of the trade and environment debate is the proposed use of trade sanctions against imports using "unacceptable" processes and production methods (PPMs) (Stevens 1993). In this regard, what is perhaps the most important for the Philippines and other ASEAN

countries is the proposal for an international agreement or bilateral agreements on tropical timber. There is the danger that, unless the principles of international cooperation on trade and the environment are clear, the environmental cause can become a subtle form of industrial protection especially in developed countries (e.g., through so-called "life cycle" regulations).

So far, domestic environmental regulations in GATT member countries have largely been governed by GATT principles which guard against discrimination of imports and extraterritoriality. During those times when they were charged with arbitrating trade disputes among GATT member countries, GATT panels displayed a propensity to block attempts at institutionalizing environment-related trade restrictions (Buencamino 1994). To the extent that governments recognized the need for a rule-based liberal international trading system, GATT members were unlikely to break GATT's rules.

Many aspects of environmental policy are best dealt with using the principle of subsidiarity, i.e., environmental problems should be addressed at the lowest appropriate level. Environmental regulations pertaining to point-sources of pollution, for example, can be best addressed at local/national levels and need not require uniform regulations across countries. For this reason, and given existing GATT principles, foreign environmental regulations per se do not seem to pose any serious constraint on Philippine trade at present. Foreign environmental regulations that deal with production and even consumption externalities (e.g., emissions standards) have not been generally import-restricting or coupled with import-restricting trade measures.

Nevertheless, there is growing concern about global and transboundary environmental problems that has given rise to calls for the harmonization and/or complementarity of national environmental policies and for multilateral environmental agreements (MEAs) outside the GATT framework.

Environmentalism used for economic protectionism is probably essentially a transitional phenomenon, born out of wrong perception, lack of information and adjustment difficulties in the developed world. Environ-

mentalism as reflected in changing demand patterns and production processes, however, is a permanent phenomenon. Environmental attributes have seeped into the consumer preferences especially of those in the developed countries. This has led to the adoption of environment-related product and process standards in the developed world. Green consumerism in the developed countries has also given rise to such practices as eco-labelling schemes which in effect enable consumers to directly influence production and product standards without mandatory stipulations from government. The changes in consumer preferences offer opportunities for new export niches as well as challenges for product and process modifications for old exports of developing countries. Thus, it behooves Philippine exporters to take cognizance of environment-related changes in consumer preferences and production techniques in the developed countries.

On the Philippine front, a number of "environmentally preferred products" (EPP) have been or are currently being developed such as handmade paper, charcoal briquettes and various "organic" (biodegradable) substitutes to chemical fertilizers, insecticides and herbicides. Other innovations include alternative building materials or alternative uses of agricultural or industrial waste or by-products such as coir dust and waste pulping liquor (Israel, forthcoming). To some extent, these developments can likewise be taken as indicative of an emergent green consumerism in the Philippines.

Green consumerism and environmental regulations can lead to market segmentation which is, to some extent, inevitable, given the diversity in ecological settings between and within different countries. This diversity understandably warrants disparate environmental "standards" and regulations. Moreover, different populations may have different environmental "preferences" — choosing different trade-offs between pollution and economic activity, for example. On top of this, different countries have dissimilar institutional frameworks which can be expected to influence future environmental policies. An undesirable mix of these factors may yield an assortment of environmental regulations and procedures that could effectively segment markets and significantly raise the transactions costs of exporting.

Even if these regulations are not designed to systematically discriminate between imports and locally produced goods, exporters catering to heterogeneous markets may face significantly higher transactions costs compared to domestic-oriented firms. The costs of gathering information on market requirements will be higher the less concentrated the direction of exports is. The costs of reputation-building may become more significant, further raising barriers to entry. Search and bargaining costs for more diverse suppliers as well as markets will likewise be higher. Even "market-friendly" measures such as eco-labelling may entail different costs to exporters and their competitors in the importing markets because developed country consumers have more limited access to information regarding foreign products and processes (and their attendant externalities); in addition, there are unequal costs to meeting certification requirements between foreign exporters and domestic producers.

For instance, some major commodity exports of the Philippines (e.g., fruits and vegetables, coconut products, animal and vegetable oils) may be especially penalized by protracted certification procedures and requirements which require investigation into production processes and factory conditions. This becomes more so if process standards in importing countries require more lengthy background checks. Even if certification is "voluntary" (i.e., eco-labelling), such process standards may effectively exclude imports from other countries because of information costs. Such labels can have the same effect as brand names.

The information asymmetry can also run the other parallel way, i.e., Philippine exporters having limited information on export market requirements. A limited interview of some company managers (who filled in questionnaires) indicated a relatively low level of awareness among those in the Philippine business community of environmental regulations in other countries. In particular, most of the respondents were unfamiliar with the eco-labelling programs in other countries.

Considering that environmentalism took root in the developed countries only recently, the corresponding changes in consumption patterns and production techniques remain in flux at present. It is apparent that the

continuous flow of information on world developments in environment-related consumption and production patterns is a useful tool for the Philippine exporters to gain from — as well as adjust to — the environment-related developments in the developed countries.

CONCLUDING REMARKS

The Philippines will benefit from the adoption of more outward-oriented economic policies together with stronger domestic environmental management. A more liberal trade regime can encourage local firms to be more competitive and, thus, more efficient. The more rapid adoption and diffusion of state-of-the-art technology, most of which comes from industrialized countries (where environmental standards are higher and stricter), would mean a younger capital stock (i.e., newer machines) that uses resources more efficiently in economic as well as ecological terms. Export-oriented industries would be induced to cater to the requirements of the major export markets which are also the countries with relatively stricter environmental standards.

The importance of stronger domestic environmental management must also be emphasized. Overall, it appears that stricter compliance with existing Philippine environmental regulations can be achieved without breaking the backs of most industries. Cost-internalization does not appear to be a serious threat to the country's export performance. Moreover, the abatement costs presented earlier in the paper are even overestimates in view of the (generally) cheaper option of process-innovations and the positive economic returns from waste minimization compared to strictly end-of-pipe technologies. (Several success stories of Philippine firms reducing production costs and at the same time reducing pollution load through waste minimization process innovations have been catalogued by the Industrial Environmental Management Project of the DENR and USAID.) However, because the social benefits of pollution control or prevention are dispersed and may therefore exceed the private benefits to a firm, a lower than optimal

level of investment is to be expected under unregulated conditions. This is why there is a need for regulatory standards to begin with.

An Industrial Environmental Management Project (IEMP) study reports that environmental investments remain low despite existing regulations, in part because of lax government enforcement (SGV Consulting 1993). The incentive to comply is ambiguous. Furthermore, as indicated in the qualitative responses of company representatives, a weak implementation of Philippine environmental "standards" in the face of stricter environmental standards abroad would induce some exporters to shift to the domestic market. Moreover, maintaining lax environmental regulations and enforcement will entail greater costs in abatement, resource degradation and depletion in the future. Uninternalized costs of externalities are equivalent to subsidies that unduly bias some industries over others without fully accounting for the actual social costs.

However, distributional considerations cannot be overlooked. There is a need to grant more leeway to small firms in the course of getting tougher on domestic industry as a whole. For one thing, economies of scale may be significant in environmental investments. For another, unlike large firms for which internally-generated sources of financing may be available, small and medium-sized enterprises find it difficult to gain access to capital for environmental investments due to low or negative private returns (SGV Consulting 1993). These firms should thus be the focus of technical assistance and special financing programs in the future. Likewise, targeting or prioritization should consider locational factors. Regulating small and dispersed sources of pollutants cannot be approached with the same urgency and the same instruments as large and/or spatially concentrated sources.

Given that some market differentiation in the developed world (due to diverse standards and/or consumer preferences) is inevitable, a mechanism or program should also be established to encourage export-oriented firms to undertake environmental management investments to meet the existing environmental regulations in foreign (OECD) markets. Such incentives should aid in minimizing adjustment costs and offsetting the higher transaction costs of exporting. Market niching will also be facilitated if the

foreign offices of the Philippine government can assist in gathering information on market requirements or emerging preferences abroad.

Lastly, the relative urgency of basic public infrastructure needs in the Philippines for environmental management should be duly noted by (international) environmental organizations, multilateral institutions and the international donor community. Whereas local and international discussions (e.g., in mass media) have tended to highlight the environmental effects of pollutive industries, the basic infrastructural needs of the Philippines such as sewerage, sanitation, municipal wastes, and drainage systems, have not been given due emphasis as imperative for environmental protection. Lobbying for stringent standards of regulation in developing countries focusing primarily on industries ignores the different priorities faced by such nations. More importantly, in view of the fiscal constraints facing the Philippines and other developing countries, genuine environmental concern necessitates that aid and financial resources be directed also towards basic infrastructure investment and technical assistance for environmental protection.

BIBLIOGRAPHY

Anderson, K. "Welfare Analytics of Trade and Environment Policies." In K. Anderson and J. Blackhurst (eds.) *The Greening of World Trade Issues.* London: Harvester-Wheatsheaf, 1992.

Buencamino, Jose Antonio. "GATT and the Environment." Paper presented at the AIM Policy Forum on GATT and the Environment: Implications for the Philippine Sustainable Development, Manila, Philippines, 1 August 1944.

Cruz, W. and R. Repetto. *The Environmental Effects of Stabilization and Structural Adjustment Programs: The Philippine Case.* Washington, D C.: World Resources Institute, 1992.

de los Angeles, M. and H. Peskin. "Environment and Natural Resources Accounting Project Phase II: Main Report." Paper presented at the International Workshop on the Contribution to Policy of Environmental and Natural Resources Accounting, Tagaytay, Philippines, 16-21 January 1994.

Ebarvia, M. C. "Valuation of Environmental Damages." Workshop Paper No. 3 ENRAP Phase II Final Workshop. Quezon City, Philippines, 16 March 1994.

Hooley, R."Productivity Growth in Philippine Manufacturing: Retrospect and Future Prospects." PIDS Monograph Series No. 9. Makati: Philippine Institute for Development Studies, 1985.

Intal, P. S. and J. Power. *Trade, Exchange Rate and Agricultural Pricing Policies in the Philippines.* World Bank Comparative Studies on the Political Economy of Agricultural Pricing Policy. Washington, D.C.: The World Bank, 1990.

Intal, P. S. et al. *Trade and Environmental Linkages: The Case of the Philippines.* Draft Report to UNCTAD and Philippine Government, 1994.

Orbeta, E. M. "Valuation of Direct Environmental Waste Disposal Services." Workshop Paper No. 2 ENRAP Phase II Final Workshop. Quezon City, Philippines, 16 March 1994.

Panayotou, T. *Green Markets: The Economics of Sustainable Development.* San Francisco and Cambridge, Mass.: ICEG and HIID, 1993a.

Panayotou, T. "Empirical Tests and Policy Analysis of Environmental Degradation at Different Stages of Economic Development." World Employment Program Working Paper. Geneva: International Labor Organization, 1993b.

Roque, C. and M. Garcia. "Economic Inequality, Environmental Degradation and Civil Strife in the Philippines." 1992. Mimeo.

Sajise, P. et al. *Saving the Present for the Future: The State of the Environment.* Quezon City, Philippines: University of the Philippines Press, 1992.

SGV Consulting and RCG/HBI. "Financial Resources to Fund Environmental Investments." Policy Paper No. 1. EMB/USAID: Industrial Environmental Management Project, 1993.

Stevens, C. "Trade and Environment: The PMS Debate." OECD, 1993. Mimeo.

World Bank. *World Development Report 1987,* 1987.

Highlights of Discussion

TRADE AND ENVIRONMENT

Estimates show that the country's present export industries are less pollutive than the import industries. But given the dynamic context of trade and industry, it may be that our present imports will be tomorrow's exports. And with the rate of technological progress and capital accumulation, we may run the risk of producing industrial exports that exact a heavy toll on the environment, creating a dilemma in trade and environment relation. Does this therefore mean that pro-trade is anti-environment in a dynamic context?

Not necessarily. A dynamic and sustainable trade regime tells us to incorporate environmental costs in production. Over time, as more Filipinos find it more profitable to produce what they used to import, the threat of highly pollutive production becomes greater. In fact, this is already a concern in Cebu. The electroplating industry which produces hazardous waste calls for common waste treatment facilities, similar to what the German government is offering. In Manila, more of the same facilities will be needed as the electronics industry expands its production and operation.

That is why it makes sense to develop policies now, as what the Department of Environment and Natural Resources (DENR) is doing, on how to deal with pollution management appraisal, compliance monitoring systems, cost internalization and similar programs to protect the environment as the country pursues a dynamic trade approach. We should demand better anti-pollution facilities and be stringent in regulating industrial pollution especially for large firms. Otherwise, the cost of dealing with hazardous waste in a wider context will be greater.