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**The Philippine Export Sector and
Environmental Concerns**

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THE PHILIPPINE EXPORT SECTOR AND ENVIRONMENTAL CONCERNS¹

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INTRODUCTION

The Philippine economy has always depended on its exports for part of its foreign exchange needs. Traditionally, the country has exported mainly natural resource-based goods, usually in their raw, unprocessed forms. It was only during the last two decades that the country has seriously tried to increase the volume of finished or semi-finished export products relative to that of raw materials.

From 1975 to 1996, there had been a shift in the composition of major exports (Table 1). During the 70's, timber, agricultural products and other 'raw' goods were the major earners. During the 80's and 90's, semiconductors and related finished products became more dominant.

The production of different types of export products causes different forms of environmental effects and impacts. Thus, when our exports change in form or type or even just in volume, environmental impacts change. Specifically, pollution and sedimentation of water bodies were the major environmental effects of our main exports during the 70's. These pollutants were mainly suspended solids from soil that eroded from our forests and agricultural production bases. In the 90's, because of the shift in emphasis of exports, toxic chemicals and heavy metals have increasingly become significant pollutants.

Table 2 shows a comparative historical distribution of Philippine imports and exports from 1975 to 1990 adopted from de los Angeles and Intal (1996). Based on the authors' analysis of the data, agriculture and forest-resource-based exports that were highly pollutive and hazardous (sugar and sugar preparations) had gone down during the period. Highly pollutive but non-hazardous resource-based exports (vegetable oils, fish and fish preparations, preserved fruits) had also gone down. However, mineral-intensive exports shifted from pollutive and hazardous products (metal ores) to highly pollutive or extremely hazardous materials (processed mineral fuel, base metals/nonferrous metals).

In addition, de los Angeles and Intal (1996) argued that while unskilled labor-intensive industries were largely less pollutive, a significant exception was the semiconductor industry which was pollution-intensive. Among human capital-intensive exports, there was an increase in non-pollutive and non-hazardous products (telecommunications equipment). However, among technology-intensive exports, there was an increase in the share of highly pollutive and hazardous materials (organic chemicals, iron and steel).

The growing trend toward *green consumerism* in developed countries may also have significant trade impacts especially if a multitude of differing standards in various countries

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acts as a trade barrier to exporters. Also gaining popularity is the call for global conventions to deal with problems of pollution of the global commons. For example, the conventions on biodiversity and climate change may eventually affect trade by using trade measures as methods of enforcement, employing ban and trade restrictions on non-signatories. They may also give rise to charges of "eco-imperialism" from the Third World, which may see such trade measures as coercion from developed countries.

Philippine exporters now have to contend not only with being competitive within the country but more so with the rest of the exporting world. This means that the country's export industry has to abide by the rules of the world. One rule that is clearly emerging in international trade is the one that requires business, trade and industry to become responsible for the environment and the stock of globally-held resources. Being responsible for the environment entails costs. These costs may take the form of cleanup after production, installing and re-tooling for cleaner technology or reducing output.

Based on findings of various studies conducted under the Environment and Natural Resource Accounting Project (ENRAP) of the Department of Environment and Natural Resources (DENR) that was funded by the US Agency for International Development (USAID), de los Angeles and Intal (1996) reported the following:

- Top sources of air pollution are households (due to fuelwood burning and vehicle use), food manufacturing, metal industries, paper, chemical and plastic products manufacturing, mining and transport services. The authors reported also that area sources are significant air pollutant emitters.
- In water, the main pollutants are BOD-5, suspended solids, total dissolved solids and toxic pollutants. Accordingly, the main sources of BOD-5 are the households due to inadequate sewerage, drainage and sanitary services provided by the government, forestry due to soil erosion and runoff, livestock production and food manufacturing.
- Suspended solids emanate mostly from mining and quarrying. Total dissolved solids come mostly from food manufacturing. Toxic pollutants come from plastics, chemicals, wood, leather, petroleum, cement and steel.

Since export figures available from various publications and interviewed sources indicate that foods, metallic mining products, leather products, chemicals and plastics are export earners, the question that arises is whether it is possible for Philippine exports to be globally competitive and protect the environment at the same time. This is the essence of this paper.

TRENDS IN THE INDUSTRY-ENVIRONMENT LINKAGE

Global Trends

There were two significant global events that strongly influenced the current trends in the linkage between industry and the environment. First, in 1992, the Rio Summit signaled the recognition of a worldwide ecological consciousness. As a result of this awareness and the various multilateral environmental agreements signed by numerous countries of the world,

(e.g., Montreal Protocol and the UN Convention on Biological Diversity), governments started to develop domestic environmental programs and policies that are consistent with the spirit of these agreements.

In turn, and on a voluntary basis, more and more business companies, especially those in developed countries, have promoted a new business philosophy. This philosophy mandates that business should take care of the environment. Thus, governments today define environmental standards and requirements for air, water and natural environment quality for industry to comply with. Also, the industry is voluntarily spending huge amounts in order to reduce aggregate pollution levels in compliance with government regulations. They also use this strategic compliance to business advantage by bestowing on their products eco- or environmental-labels.

Second, numerous governments have become members of the World Trade Organization (WTO). All member countries, the Philippines included, are required not to discriminate among member trade partners and to replace its quantitative import restrictions with bound tariffs. These requirements are supposed to pave the way for liberalized multilateral trade.

There are now concerns that the effects of the emerging business responsibility for the environment may thwart the goals of the WTO. For instance, eco-labels are intended to assure the buying public that products were produced without undue damage to the environment. Thus, they give the message that a product has some environmentally-appealing attribute.

Examples of attributes that may be used in eco-labels are energy efficiency, use of recycled materials, non-use of environmentally-harmful components such as mercury and CFCs, phosphate-free detergents and resource-conserving product designs. The claim of being ISO 14001-certified may even have the effect of an eco-label.

ISO 14001 certification is costly and not all firms, nor countries, have access to other countries' environmental labeling programs. These voluntary business initiatives for environmental conservation that are practiced mostly by developed countries may then be perceived and can actually act as non-tariff trade barriers. This effect runs counter to what WTO-membership promises.

The Philippine Experience

The Rio summit and WTO-membership both had significant influences on the industry-environment interface in the Philippines. However, environmental management initiatives by government started long before 1992.

In the late 70's and early 80's, the Marcos government worked for the enactment of the **Philippine Environment Code** and **PD 1586** which established the Philippine Environmental Impact Assessment System. The **National Environmental Protection Council (NEPC)** was also organized to implement these laws and coordinate the integration of environment into national decision-making.

Creating an environmental momentum within an authoritarian regime proved to be difficult. There were more exemptions than coverage of environmental requirements due to

excessive accommodation of self-interests. Exploitation of natural resources became short term in vision and highly opportunistic.

The **Department of Environment and Natural Resources (DENR)** during the Aquino Administration provided the institutional structure for people's power in the environmental movement. Efforts for the serious implementation of the Philippine Environmental Impact Assessment (EIA) system were initiated. Amidst the controversies generated by such projects as the Marcopper mining and Mt. Apo Geothermal Plant projects, the concept of an **Environmental Guarantee Fund (EGF)** as an additional condition to issuance of **Environmental Compliance Certificates (ECCs)** was started. In the newly organized **Pollution Adjudication Board**, a major environmental victory was achieved: the Supreme Court ruled that polluting firms can be issued **Cease and Desist Orders (CDOs)**.

The main thrust of the Aquino Administration was in the green environment sector. The number of timber concessions was reduced from a high of 182 in 1982 to about 40 in the early 1990s. This number was further reduced through a policy that banned logging in virgin forests. The forest further gained protection from the passage of the National Integrated Protected Areas System (NIPAS) Act. The government also undertook a massive reforestation program (through soft loans) which encouraged reforestation contracts awarded to corporations, LGUs, NGOs, communities and family units.

The Ramos administration instituted and translated the concept of sustainable development as Philippine Agenda 21, in support to the 1992 Earth Summit. A **Philippine Council for Sustainable Development (PCSD)** was immediately established in 1995 with NEDA acting as the chair. To broaden the base support, NGOs and people's organizations became represented in the Council.

The strongly "green sector" focus of the previous administration was augmented with a "blue sector" program. The Coastal Environment Program was implemented in order to make fisherfolk part of the national environmental program. The second half of the Ramos administration provided the "brown sector" focus. This is in recognition of the need to match the rapid urbanization and industrialization of the country with concomitant environmental management capacity.

The EIA system was strengthened as the primary tool to create a balance between development and environment. In this effort, the public is provided with increased opportunities to participate in decision-making through the social acceptability criterion required for the issuance of ECCs. Acquisition of social acceptability presupposes the conduct of appropriate consultations and the provision of just and fair solutions to valid problems and concerns raised by host communities.

Corollary to this, the institutionalization of Environmental Guarantee Funds and Multisectoral Monitoring Funds had been institutionalized as part of ECC requirements for environmentally critical projects. Environmentally critical projects are also required to conduct an Environmental Risk Assessment.

The principle of balance provided by a strengthened EIA system is perhaps best exemplified in such a potentially destructive industry as mining. The government revised the Implementing Rules and Regulations of the Philippine Mining Act of 1995. In addition to the Contingent Liability and Rehabilitation Fund (CLRF) inherent in the Act, protection of the indigenous peoples was incorporated through the requirement of obtaining their "prior

informed consent" before any mining activity could proceed. The mining project must also allot a fixed amount of their gross production costs (10%) for environmental measures and commit royalties of at least 1% of the net income to indigenous peoples should they agree to the mining project.

During the recent decade, the DENR became more specific in its environmental standards and requirements for compliance by industry. Interviews with member companies of PHILEXPORT showed that firms are aware of these requirements.

In addition to being more specific, DENR also became more active in monitoring compliance because, in 1996, it started to employ market-based instruments in support of environmental regulations. One such instrument is the **Environmental Users' Fee** now in full implementation by the Laguna Lake Development Authority (LLDA) on industries within the Laguna de Bay influence area.

Since market-based instruments require an efficient monitoring system, industries are intensively monitored. DENR has a color-coded categorization of certain key industries: "gold" (more than regular adherence to environmental standards); "blue/green" (full adherence to standards), "red" (warning) and "black" (deserves to be closed or penalized).

To further enhance understanding of the environment-economy interface, the DENR, NEDA and NSCB developed the Philippine Environment Economic and Natural Resources Accounting System (PEENRA). With PEENRA units now in place in the DENR, NSCB and NEDA, the country hopes to have a more accurate reading of whether we are proceeding along sustainable lines or creating economic growth at the expense of ecological stability.

The government has also transferred the responsibility for environmental protection from the national to the local units of government. With the Local Government Code (RA 7160), the responsibility for solid waste management and smoke belching concerns was transferred to the LGUs.

Agenda 21 and the Philippine Strategy for Sustainable Development (**PSSD**) reflected that sustainable development requires initiatives to strengthen trade liberalization and put in place environmental policies to promote environmental quality. There is widespread concern about the merits of trade liberalization and its potential conflict with the promotion of environmental goals. **Agenda 21** pointed to the importance of dealing with the root causes of environmental and development problems so as to avoid the adoption of environmental measures that had unjustified restrictions on trade. When appropriate environmental policies are in place, trade liberalization could directly contribute to effective environmental management, maybe through more efficient resource use.

A central issue is the role of a strong multilateral trading system in supporting the adoption of appropriate environmental policies, including policies to better value environmental resources. Expansion and diversification of export opportunities could promote a more diversified economic structure in commodity-dependent countries, which could assist poverty reduction and environmental protection.

EFFECTS OF ENVIRONMENTAL REGULATIONS ON THE PHILIPPINE EXPORT SECTOR

The effects of environmental measures on market access and trading opportunities should be viewed from two perspectives (1) the effects of the country's own environmental measures on the competitiveness of their exports, and (2) the impact of environmental policies in importing (developed) countries on the trade prospects of exporting (developing) countries.

1. Domestic environmental requirements and the Philippine exports

There are a number of ways in which domestic environmental policies can influence trade flows. By inducing internalization of costs, they may cause regulated firms to become less competitive relative to foreign competitors, or lead to migration of firms to escape high costs of compliance. On the other hand, there seem to be cases where strict environmental regulation led to innovation, efficiency and ultimately, greater competitiveness.

Regulations may give incentives to local producers to adopt environmentally friendly technologies. This will make them competitive in "green markets." Regulations may also press exporters and importers to favor products that have low consumption externalities in order to avoid sanctions against harmful products.

Domestic industries are likely to be pressed to adopt structural measures that will raise the level of internalization of environmental costs. Together with the other effects of free trade, these measures may make the Philippines more competitive by way of a surplus or by making comparative advantage work in favor of the country. Trade revenues will rise and environmental threats will decline. National capacities to protect the environment will rise as well (scale effects).

Environmental regulations will impose higher environmental quality standards on both exports and imports. They can reduce production externalities from exports, i.e., they will impose controls and limits on levels of negative environmental impacts allowed for industries. They may move towards giving incentives and penalties for industries to internalize their environmental costs (the costs of lowering residuals and for ensuring proper use and disposition of products in each phase of their life cycle). Hopefully, these tendencies of regulations are likely to bring about:

- Higher rates of transfer into the country of environmentally-friendly products (**technology transfer effects**);
- A rise in the level of internalization of environmental costs by local producers (**structural effects**) and
- A higher tendency by importers to favor products with low consumption externality and by exporters to prefer products that entail low production externalities (**product effects**).

As presented in **Figure 1**, all these effects will increase the production costs of exports and will lower the product differentiation of imports. They may spur adjustments in other regulations to control the trade off between environment and trade (**regulatory effects**). The result is likely to be that the competitiveness of the country's trade will decline, although perhaps only to the extent that world markets exclude environmental considerations in pricing traded goods and services. If markets begin preferring products that conform to high environmental standards, environmental

regulations will improve the country's trade income. The budget for supporting the trade competitiveness may improve as well (**scale effects**).

2. Environmental standards of importing countries

Specifically for this paper, a survey of some key exporting companies in the Philippines showed that there are no environmental requirements or standards being imposed by importing countries on our exports. Accordingly, the production of exports is subject only to DENR's requirements and standards on pollution emission for specific industries.. This means that importing countries focus only on the quality of exported products as they actually appear for inspection. They are not interested in the amount of pollution these products leave behind in their countries of origin.

Developed countries today encourage the adoption of environmental management systems (EMS) by their own industries. At present, there are three related environmental management systems being used, namely, (1) a safe minimum standard of conservation; (2) ISO 14001; and, (3) EMAS.

A Safe Minimum Standard of Conservation

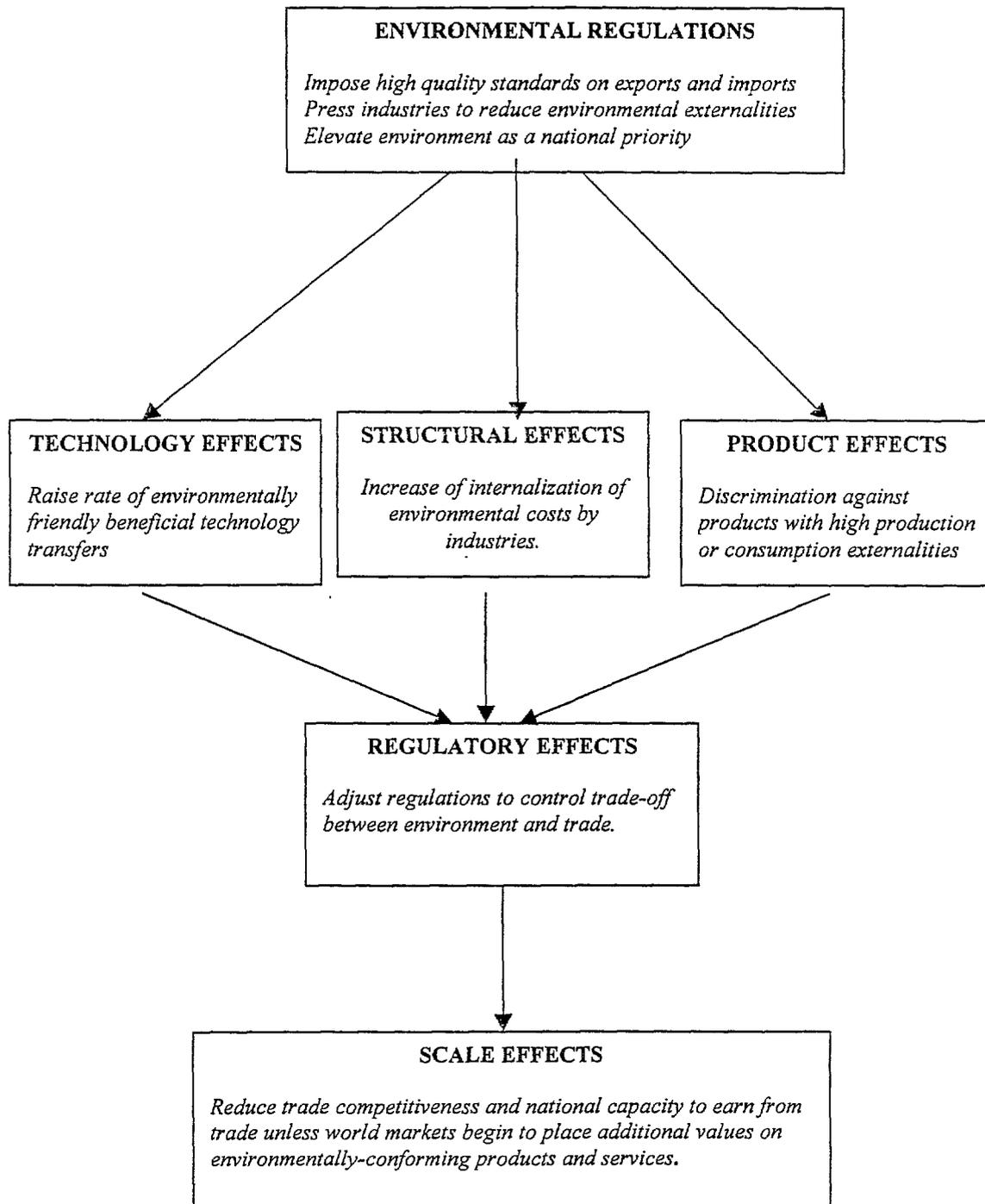
The best renewable resource harvesting policy should place some emphasis on the criterion of economic efficiency. However, if harvesting rates pose threats to the survival or sustainability of some renewable resource or jeopardize an environmental system itself (such as a wildlife reserve containing extensive biodiversity) then the criterion of efficiency may not be appropriate by itself.

When a renewable resource or environmental system is of high intrinsic value, constraints on harvesting behavior may be deemed appropriate. The notion of a **Safe Minimum Standard of Conservation (SMC)** has been advocated in response to this set of circumstances (Ciriacy-Wantrup, 1975).

A strict version of SMC would involve imposing constraints on resource harvesting and use to eliminate all risks to the survival of a renewable resource. This is unlikely to be of much relevance, however. All conceivable human behavior entails some risks to species survival, and so strict SMC would appear to prohibit virtually all economic activity. Where adoption of an SMC approach allows, under *reasonable* allowances for uncertainty, threats to survival of *valuable* resource systems are eliminated, provided that this does not entail *excessive costs*.

In some European countries, the SMC appears to be the basis for the green labeling requirement for forest products trade. In this scheme, the green label assures the rest of the world that the product was harvested from a sustainably-managed forest.

Figure 1. Effects of environmental regulations on Philippine trade.



ISO 14001

PRIME Project Module 3 on EMS being implemented by the Bureau of Product Standards of the Department of Trade and Industry and the Philippine Association of Environmental Assessment Professionals published an excellent magazine explaining the basics of EMS, particularly the ISO 14001. The publication states that ISO 14001 is the first standard in the ISO 14000 series.

The ISO 14000 is a series of voluntary standards and guidelines on EMS published by the International Organization for Standardization (ISO). The series aims "to provide all industries with a structure for an EMS that will help ensure all operational processes are consistent, effective and will achieve the stated environmental objectives of a given organization".

Adopted in the Philippines, ISO 14001 is equivalent to the Philippine National Standards (PNS) 1701. ISO 14001 gives a set of criteria and their definitions to be included in any management system intended for certification under the standard. Any business intending to implement ISO 14001 will first need to carry out a preparatory review to establish its current environmental effects, applicable legislation and legal requirements, and assess the status of suppliers and subcontractors. From this review, using criteria set down in the standard, a company environmental policy can be formulated. Identification of the company's environmental policy is just the first step in formulating that company's EMS.

Eco-Management and Audit Scheme (EMAS)

EMAS is the European Community's **Eco-Management and Audit Scheme**. It can be considered as the pinnacle of Environmental Management Systems, the step after BS 7750 certification. BS 7750 is the basis for ISO 14001. Once a company has achieved BS 7750, it should be a simple step to achieve EMAS. The main requirement is that more information about the business has to be made public. EMAS is, of course, recognized throughout Europe, and so will be useful to any company involved with European markets.

The EMAS scheme is similar to BS 7750 with the additional requirement that after the review stage of each cycle, an Environmental Statement is published.

The status of ISO 14001 with respect to EMAS is not clear. The wording of ISO 14001 does not meet the quite prescriptive requirements of EMAS. It seems quite likely that a bridging document will be issued soon. However, the issue remains far from clear.

Despite the uncertainty about the relationship between EMAS and ISO 14001, to achieve EMAS, a business will have had to implement ISO 14001. It is for this reason that conformance takes a stepped approach. We set ISO 14001 as the first target, to be followed by any bridging requirements to achieve EMAS, if it is decided that it is a worthwhile target after the first review of the system.

3. Concerns regarding compliance with requirements and standards

Some firms and organizations involved in exports were interviewed regarding industry compliance with domestic and foreign environmental requirements.

Respondents were uniform in their avowal of compliance with all DENR regulations. The Effluent Regulations of 1982 and 1990 (DENR DAO No. 35), Water Quality Criteria (DAO No. 34) and the Environmental Impact Statement System (DAO No. 96-37) were cited as the major domestic regulations these firms comply with.

The major foreign requirement cited by these firms does not directly apply to environmental standards or regulations. Rather, it is a USDA initiative to improve the safety of foods. This initiative is known as Hazard Analysis Critical Control Points (HACCP) which started in 1996. Due to the Codex Alimentarius as exemplified in the WTO Sanitary and Phytosanitary Agreements, application of HACCP principles has become mandatory worldwide, albeit, the application is limited to food.

Of more serious significance to trade, however, is the growing trend in voluntary environmental initiatives among developed countries. Observance of the SMC, accreditation with ISO 14001 and EMAS and environmental labeling are voluntary but may well serve as effective barriers to free trade between developed and developing countries. As of November, 1998, the country had only 23 firms certified to ISO 14001. There is no firm yet recorded as certified to EMAS. Environmental labeling is yet to be adopted by majority of our industries.

A survey of representative firms from the chemical, semiconductor, marine products, mining and textile industries showed their willingness to comply with DENR environmental regulations. All of them were interested in being ISO 14001 certified because they realize the competitive edge this certification will convey to them. All of them expressed their concern about the way regulations are being implemented. The consensual preference was for transparency in monitoring and fairness in conflict resolution.

The marine industry specifically would like to see more strict implementation of laws against poaching, dynamite fishing and other harmful practices because the industry is now experiencing scarcity of fish and other marine products. The representative firm said that worldwide demand is growing at a fast rate but the industry's response to the opportunity is limited because our fishery resources are depleted due to overfishing and destruction of corals and marine habitats.

Each industry interviewed stated that compliance with environmental requirements is not necessarily inimical to their business interests. Representatives said that with clean production and an EMS, operating and production costs might even be lower than environmental damage costs they might have to pay if they did not comply with requirements. They, however, seek government assistance in the form of subsidies for environmental protection devices. The SMEs would like to ask for assistance with the high cost of ISO 14001 certification.

Several representative industries would like the government to be consistent in implementing laws. They feel that it is unfair and demoralizing to those who comply faithfully with the regulations, including those set by the Bureau of Internal Revenue, to see other firms in the same industry get by with less-than-required compliance.

In contrast to industry's claims about compliance with domestic environmental regulations, NEDA (1998) reported the following:

- a. That of the 10,154 registered manufacturing firms with 10 or more employees, 8,334 generated waste water;
- b. The 1990-1995 data for factories showed very poor compliance, enforcement and monitoring;
- c. From 1992 to 1995, the following toxic and hazardous wastes incidents were reported: 7 toxic chemicals release, 2 fires and explosions, 59 major oil spills, and 6 mining accidents. The mining accidents do not yet include the 1996 Marcopper mine tailings spill of 150 million cu m that contains the heavy metals copper, cadmium and aluminum.

Further, NEDA cited the mercury poisoning in Mt. Diwalwal, Davao del Norte from untreated mine tailings that resulted from illegal gold mining, mercury refining and gold trading.

NEDA reported that non-compliance is not limited to toxic and hazardous wastes alone. Water pollution of rivers crossing highly urbanized cities and of the major lakes in the country is well beyond DENR limits. Air quality has also deteriorated due to increasing concentrations of suspended particulates.

Even industry admits that "in a study conducted for the Environmental Management Bureau, industry is the cause behind 72% of sulfur oxide emissions and 38% of the biological oxygen demand in rivers and surface waters. The generation of toxic and hazardous waste is now estimated at 232,000 tons per year and the study showed the chemical industry contributes a high 21% of these wastes" (SPIK Bulletin 1, January-March 1999).

It would appear, therefore, that industry is having difficulty in complying with both domestic and foreign environmental initiatives and regulations. Yet, environmental regulations, when effectively implemented, can lead to innovation, efficiency and greater competitiveness.

By and large, the control of pollution from pollutive industries in the Philippines is done through purely command-and-control strategy. One of the major problems in employing the strategy is the weakness in enforcing the existing pollution control laws. Hence, there is an urgent need for an innovative strategy to reverse the situation as soon as possible. Clearly, more than just regulations are needed in order for business to achieve the country's environmental goals and still stay competitive.

HARNESSING THE MARKET IN SUSTAINING EXPORT COMPETITIVENESS AND ENVIRONMENTAL PROTECTION

In the presence of well-defined and consistently enforced property rights, the market can be a potent force in aiding regulations to achieve society's environmental goals. In recent years, many countries, primarily industrialized ones, have adopted market-based instruments to introduce more flexibility, efficiency, and cost-effectiveness in environmental protection measures. There are a number of instruments available and the criteria for choice as suggested by Baumol and Oates (1979) include dependability, permanence, adaptability to economic growth, equity, incentives for maximum effort, economy, political attractiveness and minimal interference with private decision.

Theoretically, market-based instruments (MBIs) have the capability to control pollution according to market mechanisms and thus facilitate deregulation and a reduction in government involvement. In practice, however, they have not eliminated the need for regulations, enforcement, and other forms of government participation. As such, they form an important link between the market place and regulatory policy. However, MBIs alone have not produced impressive improvements in environmental quality, primarily because they are difficult to implement and have only been partially applied.

Some of the MBIs most relevant to industrial activities are charges, subsidies, marketable pollution permits, liability insurance and liability transfer (OECD, 1989). In some cases, a combination of instruments may be more effective. For example, noncompliance fees and performance bonds enforce and ensure compliance, respectively.

In practice, market-based or economic instruments are rarely used alone to achieve environmental protection objectives. Generally they supplement direct environmental regulations to raise revenues for financing pollution control activities or other environmental measures, provide incentives to better implement regulations, and stimulate technical innovation. In industrialized countries, there are no known examples of instances where economic instruments have fully replaced direct regulation of polluting activities (OECD 1989 cited in Bernstein 1993:3). In almost all cases, economic instruments supplement direct regulations, thereby contributing to the achievement of policy objectives.

Market-Based Instruments and Their Potentials

Economic incentives can come in the form of a financial transfer (tax, charge or subsidy), a modification of relative prices (taxation on certain products), or a clear specification of rights (transferable emission permits or resource rights). These instruments operate as financial incentives to polluters, who select the most advantageous solution: polluting and paying, or investing in pollution control to avoid paying. These approaches have the following common elements: existence of a financial incentive, possibility of voluntary action, involvement of government-related authorities, and the intention of maintaining or improving environmental quality by applying the approach.

1. Charges

These are the most widely used forms of economic instrument. There are two kinds, depending on the purpose of the charge. First, the revenue-raising charge, useful when collective treatment facilities are being considered, is intended to pay for investment and maintenance cost of said collective facility. Examples are co-responsibility charges (such as

effluent charges), user charges, administrative charges, product charges, and tax differentiation. With charges, there is not always a direct link between the revenue raised and the environmental objectives being pursued. Many times, the level of the charge does not correspond to the actual damage caused.

Second, the regulatory charges are similar to revenue-raising charges but they focus on the regulatory effects of the charge. Thus, the charge is set at a level that makes prevention (e.g., in-house treatment, cleaner technology, substitution of 'cleaner' products) financially attractive. Examples are charges on leaded gasoline, pesticides, tobacco and alcohol.

The ultimate destination of revenues from charges is important and will affect the success of their implementation.

2. Subsidies

Subsidies may be in the form of grants, soft loans, or tax advantage. They are effective when their levels are in proportion to the reduction in environmental damage. They should be short term and should be obtainable only by economically viable enterprises.

Subsidies make environmentally friendly acts cheaper. However, they violate the polluter pays principle and are extremely difficult to revise or abandon once implemented. They can have unintended effects that negate some or all of their benefits .

3. Deposit-refund schemes

These schemes are intended to pay for environmental costs of wrongly disposing wastes. They specify the maximum economic consequences of non-compliance. They work even when environmental degradation is not directly observable or when potential polluters are many and/or mobile. They may stimulate even those not directly involved to reduce the effect of waste disposal on the environment.

4. Transferable rights (marketable pollution permits)

These seek to create a structure of property rights that, through the process of trade, will signal information on the relative scarcity of environmental assets. Existing and potential users of the asset have the choice of paying the market price for a right or implementing an innovation that will reduce their use of the natural resource.

The success of this type of economic instrument depends on the dynamics of the market place and the management agency and/or the legal framework used to delimit the market. Overseas examples are air pollution emission trading rights, acid rain allowance trading, tradeable consumption and production rights for CFCs and halons, tradeable water pollution rights and trading in lead additives.

5. Performance bonds, non-compliance fees and offsets

These are legal instruments to achieve physical regulations. Performance bonds are ex-ante payments to authorities in expectation of compliance with imposed standards. These deposits are held until the project is finished and the development has been undertaken in accordance with pre-specified conditions. Work required to achieve standards will be paid out of the bond and the remainder is refunded.

The performance bond must be of sufficient size to cover the cost of meeting any obligations associated with resource use and development. This is a safeguard because under the performance bond system, firms have a right to walk away from their environmental obligations and simply give up their deposits.

Non-compliance fees are imposed as an ex-post payment (or fine) when polluters do not comply with certain regulations. The amount charged is usually related to the profits made through non-compliance.

Offsets are a developing concept. The offset principle suggests that significant adverse effects on environmental quality should be balanced by complementary investments that lead to natural resource appreciation or environmental improvement. Thus, a firm may be given permission to emit carbon dioxide in one place if the same firm will reforest and keep under forest cover a specified area. The difficulty is in determining the appropriate levels of offsets to impose and in ensuring that the beneficial effects of the offset really cancel the damages from the initial activity.

Experiences With Market-Based Instruments

Economic instruments or market-based instruments (MBIs) such as marketable pollution permits, environmental taxes and subsidies are being implemented in many countries to achieve specific environmental objectives. They are envisioned to complement the existing system for environmental management. They have not eliminated the need for regulations, enforcement, and other forms of government participation.

Most countries have experience in the use of charges, subsidies, and deposit-refund schemes as instruments in achieving environmental goals. In the Philippines, the use of emission charges is exemplified by the Environmental User Fee being imposed by DENR on wastewater discharges into Laguna Lake. Deposit-refund schemes are exemplified by the deposit on soft drink bottles and on the 'trade-in value' being offered by some car battery outlets for old car batteries.

Performance bonds are being experimented in the Philippines through the Environmental Guarantee Fund that has mostly been imposed on mining permits. Tax exemptions for anti-pollution devices, tax on mine wastes, creation of a market for waste exchange, risk liability systems, renewable resource taxes, and differential fuel pricing are also at present being implemented in the country.

Regulated industries, with the support of some government agencies, are at present pushing for subsidies in whatever form that may help the industries comply with standards of DENR and other sectors, including those of importing countries.

Offsets and transferable pollution rights (or marketable pollution permits) have not been tried at all in the country. Other countries have tried marketable pollution permits with varying degrees of success.

Experience in the United States and other industrialized countries demonstrated that under certain market conditions, MBIs are more efficient than direct regulation for controlling and abating some forms of pollution.

Many environmental economics literature portrayed marketable permit programs as a cost effective and least cost solution to meeting an emission standard. The success of marketable permits rests on the fact that they address the problem of undefined property rights directly. Nevertheless, it is believed that marketable permits must be properly designed to assure the prevention of environmental deterioration and improvements in environmental quality.

Marketable pollution permits are based on the polluters-pay-principle. The polluters-pay principle (PPP), adopted by the OECD in 1972, states that 'the polluter should bear the cost of measures to reduce pollution decided upon by public authorities to ensure that the environment is in an acceptable state' (World Bank, 1992). The PPP is a useful starting point, but provides little help in judging the cost-effectiveness of alternative policies.

The internalization of external cost is viewed as an essential aspect of economic efficiency and hence, efficient pricing. In general, wherever accountability can be established, it is most efficient for society to make the polluter pay for his own pollution and try to recover the cost in the price of his product. The notion of holding a manufacturer accountable for his own pollution cost and allowing this cost to be passed on to consumers provides clearer market signals of the true total cost of producing and consuming the polluting product.

1. The U.S. Experience

The US tradeable permits program received a fresh boost from the 1990 Clean Air Act. Numerous reports attest that 'emission trading can achieve substantial cost savings, but apparently not to the extent anticipated, about 40-50% (Barde and Opschoor, 1994). The program has unquestionably and substantially reduced the cost of complying with the requirements of the Clean Air Act.

Most estimates place the accumulated capital savings for all components of the program at over \$10 billion. This does not include the recurring savings in operating cost. On the other hand, Tietenberg (1992) recognized that the program has not produced the magnitude of cost savings that was anticipated by most proponents at its inception. To this extent, the theoretical underpinnings of the tradeable emission plans are supported in laboratory experiments. Results of laboratory experiment by Muller and Mestelman (1994) on tradeable permits indicated that costs were significantly reduced. Such laboratory experiments imply that the market institution chosen to implement a tradeable permit plan may greatly influence the success of the plan.

Pearce and Warford (1993) expressed that the U.S. experience with marketable permit system suggests that the level of trading activity between polluters has been less than ideal. This may be due to the uncertainties endemic to the U. S. approach: uncertainties about the willingness of other firms to trade, the cost of obtaining the permission of regulators to trade, uncertainty about the prospect of rising permit prices. Nevertheless there is no evidence that environmental standards in the United States have been sacrificed by the trading system. Another important advantage of this system is that it facilitates continuous economic growth in polluted areas without further increases in pollution levels. Nonetheless, 'the effect of marketable permit systems on environmental quality has not been impressive; the direct effect of these instruments has been reported to be neutral or slightly positive' (Bernstein, 1993).

The effectiveness of emission trading, according to Brady (1983), will be affected by technical deficiencies in the current regulatory system. To the extent that some factors cause

problems in the existing regulatory system, they will cause problems in an emission trading system.

2. The Asian Experience

None of Asia's newly industrializing economies—for example, Korea, Taiwan, Hong Kong and Singapore—has had significant use of marketable permits as a policy instrument. This may reflect the unfamiliarity with the instrument as well as the limited capacities of environmental agencies in these countries to effectively administer such a system. With little experience to date in the operation of pollution permit markets, even in OECD countries, any country setting up such markets would effectively be a pioneer who would have to be willing to take risks and bear the cost of learning by doing. If the objective is a rapid response to an urgent pollution problem, 'the time consumed in moving down the learning curve could be a deterrent to the adoption of this approach' (O'Connor, 1993).

There is, however, at least one example of the use of marketable permits among the Asian NICs—Singapore's system of auctionable permits for the consumption of ozone depleting substances (ODS). Accordingly, each quarter, the national quota of ODS is allocated among importers and users, half on the basis of historic consumption and half through an auction. Importers and users must register to participate in a tender process conducted by sealed bids in which each firm indicates the amount of ODS it would like to purchase and offer its price.

3. The European Experience

Burtraw (1993) reported two reasons why marketable emission permits have attracted more interest than emission fees and other forms of incentive-based environmental regulation as a means for regulating SO₂ emissions in Europe. First, under the emission permit trading system, the European Community could directly control the level of SO₂ in Europe by restricting the number of permits it issues to SO₂ emitters. Second, by constraining trading in certain areas or by certain polluters, it could control the level of such emissions in the locations that suffer the most from the environment and health effects of sulfur deposition.

Judgement about the usefulness of MBIs should be based on the extent to which they meet four performance criteria: effectiveness, efficiency, equity, and flexibility (USAID, 1993). Economic incentives that meet these four conditions reasonably well have a chance of success. Regardless of the theoretical appeal, an instrument fails if it is ineffective in reducing pollution, unacceptably inefficient in accomplishing its goals, violates strongly held social canons concerning equity, or lacks the flexibility to change with shifting economic, technological, and environmental conditions.

Current Government and Private Sector Initiatives

The private sector-government tie-up for an environmentally responsible business sector is a fairly new one in the Philippines. Yet, both sectors have been very active during the recent past in environmental initiatives. Noteworthy initiatives intended to make the business sector competitive through environmental management are:

1. RESPONSIBLE CARE

This is a globally-recognized voluntary program that the chemical industry started in Canada in 1986. To date, there are over 80 countries adopting the program. The combined chemical production from all these countries constitutes more than 86% of total world output.

The Samahan sa Pilipinas ng mga Industriyang Kimika (SPIK) embraced the program in 1996 thereby committing itself to implementing the RESPONSIBLE CARE's complete management system for safety, health and environment activities. Today, there are 24 signatory SPIK companies.

2. PRIME Project

PRIME (Private Sector Participation in Managing the Environment) is a project of the BOI-DTI funded by the UNDP. It aims to strengthen private sector initiatives in environmental management. This is the first major and comprehensive government-business tie-up toward environmental management. The PRIME brochure claims that the following initiatives are being systematically promoted by the project:

- a. **Philippine Business Agenda 21** - This is the industry's response to the call for sustainable development by the Philippine Agenda 21. Business Agenda 21 was spearheaded by the Philippine Business for the Environment with help from BOI-DTI. It is envisioned to be developed by industry associations for specific industries. It is a statement of commitment to environmental standards and protection and efficient business operations.
- b. **Urban Tech 21** - Aimed at efforts to reduce global warming, this provides companies access to appropriate technology that will reduce carbon dioxide and methane emissions.
- c. **Industrial Ecology** - This is aimed at reducing waste by encouraging recycling of materials and energy. It is hoped that, wherever possible, industries will eventually mimic the closed loop materials and energy flows found in nature, PRIME will pilot industrial ecology principles in at least one industrial area and is willing to provide technical assistance in setting up a common waste treatment and resource recovery facility.
- d. **Environmental Management System (EMS)** - The project assists small and medium enterprises in implementing an EMS. An EMS will self-regulate the company's impacts on the environment. PRIME advocates that companies obtain ISO 14000 EMS certification so that aside from being environmentally responsible and being efficient in production, the companies' products also become globally competitive by meeting international standards. At present, some 25 companies have already been certified to the ISO 14001.

Implementation of an EMS is now being facilitated by the EMS InfoNet established through the joint cooperation among the Bureau of Product Standards, Board of Investments-Department of Trade and Industry, Environmental Management Bureau-Department of Environment and Natural Resources, Technology and Livelihood Resource Center, the Philippine Business for the Environment and the Philippine Sustainable Development Network.

- e. **Ecolabeling of products** - This is a voluntary recognition scheme that nevertheless imparts a competitive edge on products with ecolabels, in both local and global markets. In her paper, (Global and Local Initiatives in Product Ecolabelling), Liza C. Antonio expounds that local initiatives in ecolabeling are those of the product ecolabelling schemes closely linked with product quality standards. Examples are the energy Efficiency Ratios (EERs) for non-ducted air conditioners, Energy Efficiency

Factors (EEFs) for refrigerators and freezers and specifications for laundry soaps and detergents.

The same paper reported that guidelines had also been prepared for an Ozone Friendly Mark to recognize companies that have eliminated ozone-depleting substances in their products and processes. Some tuna canneries have obtained certification from the Earth Island Institute to indicate that these canneries use fish caught with techniques that are not harmful to dolphins and other marine mammals.

3. The Philippine Mineral Industry's Code of Conduct for the Environment

Launched in February 1999, this code is aimed at the challenge for the mining industry to be "environmentally and socially responsible". According to an article in *Business and Environment*, "The Code covers all phases of mining operations. The Code requires all signatories to establish an environmental management system, to strive for best practice in environmental management, and to integrate risk assessment and management in all aspects of their operations".

CONCLUSIONS AND POLICY RECOMMENDATIONS

Trade could be a force for environmental improvement. Along with increases in income, increased ability can also come to undertake long-term planning that preserves or enhances natural capital such as soils, forests and fisheries. It is anticipated that one condition to making the Philippines a winner on both environmental protection and free trade is the rise of "green markets" worldwide. There are several good reasons for adopting greener practices by the export sector:

- By using less energy and producing less waste, the industry can reduce production costs.
- By adhering to clean technology and production, industry can reduce cost of compliance with environmental legislations and regulations that are becoming more stringent.
- By being 'clean and green', industry can take advantage of the rewards offered by new economic instruments.
- Implementation of many environmental measures is quite simple and mostly means reducing waste through better management.
- The more restrictive purchasing policies of some major companies and government agencies are putting pressure on their suppliers to show compliance with good environmental practice.
- Customers are increasingly demanding greener products from credible sources: You cannot just say it is green. You have to be able to prove it.
- Companies which undertake measures ahead of legislation can gain a competitive advantage over their rivals.
- Responsible environmental behavior by industry is in vogue and improves media image and sales.
- Employees, particularly the best and brightest, prefer to work for an environmentally responsible company.
- Insurance companies have been hit by covering the environmental disasters of insured firms. They prefer to cover environmentally clean companies

The following policies are recommended to support the export industry and at the same time ensure environmental protection.

1. Improvement in the scale of national effort to protect the environment

Environmental protection and management should be a priority in the budget allocation of the government. Protection cannot be effectively done unless environmental monitoring data are consistent, transparent, fair, up-to-date and readily available to anyone who may want to know, use or verify such data. In addition, more funds should be allocated for better implementation of environmental regulations. The DENR, in particular, needs more funds to ensure that:

- a. the regulated entities understand what the regulations mean and imply;
- b. monitoring of compliance is adequate and up-to-date; and
- c. resolution of violations is fair and prompt.

2. Improvement in the manner of pursuing environmental goals

Experience in many countries shows that environmental goals are more quickly attained at a lower cost to society if regulations are supported by economic instruments. Thus, we should seriously strategize to put greater emphasis on the use of instruments that would allow industry to regulate its own behavior simply because it is more profitable for it to do so. The government and the private sector should fast-track ex-ante policy studies on potential effects of certain MBIs for specific policy issues. More importantly, both government and industry should ensure that data sets used in such simulations and analyses are realistic and true. In the long run, the time and money spent on such ex-ante studies will be more than recovered in terms of greater implementability and effectiveness of resulting policy proposals.

Aside from these efforts at developing new tools and methodologies for environmental management (e.g., Environmental Risk Assessment and Population-Resources-Environment Linkages Assessment) must be intensified.

3. Provision of a business environment that is supportive of and conducive to adoption of voluntary environmental initiatives by industry

There is a strong voluntary environmental movement in industry at present. The government should provide the appropriate milieu for this movement to develop into a potent tool for environmental management. Specifically, it should:

- a. encourage further voluntary initiatives by reducing transactions costs involved in complying with government directives. Examples of such costs are those involved in getting environmental permits and those involved in proving compliance with standards and requirements. To this end, the government should work toward accreditation/recognition of private laboratories for environmental analysis. In fact,

- b. government should provide incentives for the active participation of the private sector in environmental entrepreneurship and supply of environmental services.
 - c. provide incentives for adoption of clean production technology, maybe in the form of subsidies for re-tooling and training; for transfers of environmentally-friendly technologies into the country; and for procurement and use of environmental protection devices;
 - d. promote ecolabeling by increasing expenditures aimed at raising public appreciation and preference for "clean and green" goods and processes;
 - e. provide assistance to industry, especially the small and medium enterprises (SMEs), in obtaining ISO 14001 certification by lowering costs through:
 - 1) accreditation of local certifiers;
 - 2) establishment of registries of auditors and trainers; and
 - 3) offering training programs for companies interested in setting up and implementing an environmental management program, especially if such program is aimed at ISO 14001 certification;
 - f. facilitate the application of industrial ecology principles through a rational land use plan that identifies suitable industrial zones.
4. Widen the participation of all sectors of society in environmental management

Harmful practices such as poaching in Philippine fishing grounds by other nationals, rampant use of dynamite by small fishermen and the active trade in corals and coral products are not doing our fishery resources any good. The military and the DENR should be given additional financial and logistic support to effectively protect our sovereignty over our own waters.

The capability of LGUs to manage and resolve local conflicts over natural resource use should also be strengthened. Ordinary citizens and NGOs are also needed in the campaign for resource conservation.

With the devolution of authority and property rights over natural resources, the emergence of community-based natural resource management (CBNRM) and the trend toward industrial ecology, industry may well be advised to consider the idea of community-based industry operations. Specifically, it is not far-fetched to imagine that in the future, we will see more and more parallels of the Green Label for timber products in Europe. The Green Label assures the market and the buyers that the timber was harvested from a sustainably-managed forest.

Local communities can generate sustained incomes and industry can realize cost savings and sustainability of operations if the two can be made to forge effective tie-ups. The former can take the lead in resource protection and management and in ensuring that the environmental claims of ecolabels are true. The latter can "market" the resource commodities and products, making sure that the local communities are given their rightful share of profits and resource rents from where these communities will get the funds for resource and environmental management and protection.

5. Participation in global environmental concerns should be given increased support. Many environmental conventions are graduating from the level of general agreements to that of operational commitments.

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Table 1. Philippine exports by major commodity groups, 1975, 1986, and 1996
(FOB value in million US dollars)

Commodity Group	1975		1986		1996	
	Value	% Share	Value	% Share	Value	% Share
Traditional Exports						
Coconut products	466	20	470	10	713	4
Sugar and sugar products	616	27	108	2	140	1
Forest products	260		251		43	
Logs	167	7	26	0	0	0
Lumber	27	1	103	2	25	0
Plywood	21	1	56	1	5	0
Veneer sheets/corestocks					13	0
Others	45	2	66	1	0	0
Mineral products	332		267		404	
Copper concentrates	212	9	90	2	52	0
Gold	76	3	140	3	55	0
Iron ore and concentrates	13	1				
Chromium ore	13	1	10	0	8	0
Others	18	1	27	1	289	1
Fruits and vegetables	124	5	346	7	209	1
Abaca fibers	15	1	13	0	21	0
Tobacco, unmanufactured	34	2	21	0	29	0
Petroleum products	332	14	66	1	272	1
Non-Traditional Exports						
Non-Traditional, manufactured						
Elec. & electrical equipment/parts & telecom	47	2	903	19	9,988	49
Garments	107	5	750	16	2,423	12
Textile yarn/fabrics	9	0	34	1	252	1
Footwear			31	1	138	1
Travel goods and handbags	78	3	146	3	121	1
Wood manufactures	17	1	28	1	151	1
Furniture and fixtures			89	2	293	1
Chemicals	22	1	243	5	353	1
Copper metal					297	1
Non-metallic mineral manufactures	32	1	17	0	95	0
Machinery & transport equipment	10	0	54	1	1,294	6
Processed food and beverages	15	1	136	2	351	2
Miscellaneous manufactured articles, nes					546	3
Others	30	1			1,107	5
Non-Traditional, manufactured						
Nickel			9	0		
Iron ore agglomerates			85	2	70	0
Bananas			130	3	237	1
Mangoes					40	0
Coffee, raw, not roasted			119	2	1	0
Fish, fresh or preserved			144	3	295	1
Of which: Shrimps & Prawns					150	1
Rice			11	0		
Others					161	1
SPECIAL TRANSACTIONS			1	0	117	1
RE-EXPORTS	2	0	112	2	382	2
TOTAL EXPORTS	2,294		4,842		20,542	
GNP	15,868		30,449		87,069	
% Share of Exports to GNP		14		16		24

Source: NCSO

Table 2. Distribution of Philippine imports and exports, by factor and pollution intensity (in percent)

Factor Intensity	IMPORTS				EXPORTS			
	1975	1980	1985	1990	1975	1980	1985	1990
Agriculture resource intensive goods	14.76	11.54	12.71	15.98	70.59	46.73	37.66	22.36
Mineral resource intensive goods	32.94	37.94	29.19	23.66	15.57	24.00	16.73	14.60
Unskilled labor resource intensive goods	8.26	15.64	18.06	13.10	8.77	15.66	22.07	37.26
Human resource intensive goods	11.66	18.48	27.64	27.35	4.20	12.07	19.96	19.54
Technology resource intensive goods	32.38	16.39	12.40	19.90	0.87	1.54	3.57	6.25
TOTAL	<i>100</i>							
Pollution Intensity	IMPORTS				EXPORTS			
	1975	1980	1985	1990	1975	1980	1985	1990
Highly pollutive/Extremely hazardous	32.47	39.10	32.12	24.42	2.27	2.85	3.55	5.00
Highly pollutive/Hazardous	14.77	14.73	10.94	19.41	31.31	10.63	13.83	10.37
Highly pollutive/Non-Hazardous	4.46	3.40	2.14	4.58	17.43	17.84	20.98	6.47
Pollutive/Extremely hazardous	1.74	4.29	5.04	5.30	0.28	0.56	1.73	2.09
Pollutive/Hazardous	34.46	25.31	34.32	27.08	17.68	34.74	32.51	30.92
Pollutive/Non-Hazardous	0.86	0.68	1.12	1.25	0.32	0.42	0.99	1.34
Non-Pollutive/Hazardous	8.07	6.44	7.63	9.20	1.87	20.88	8.90	11.24
Non-Pollutive/Non-Hazardous	3.18	6.06	6.68	8.77	8.86	12.10	17.52	32.57
TOTAL	<i>100</i>							

Source: De los Angeles, M. and P. Intal, **Philippine Environmental and Natural Resources. In Final Report for National Level Studies**, ASEAN Sub-Programme on Trade and Environment, Philippine Institute for Development Studies, 1996.

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