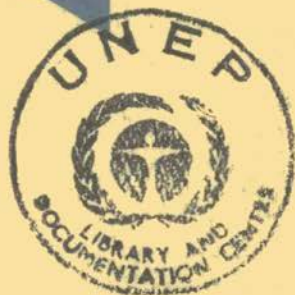
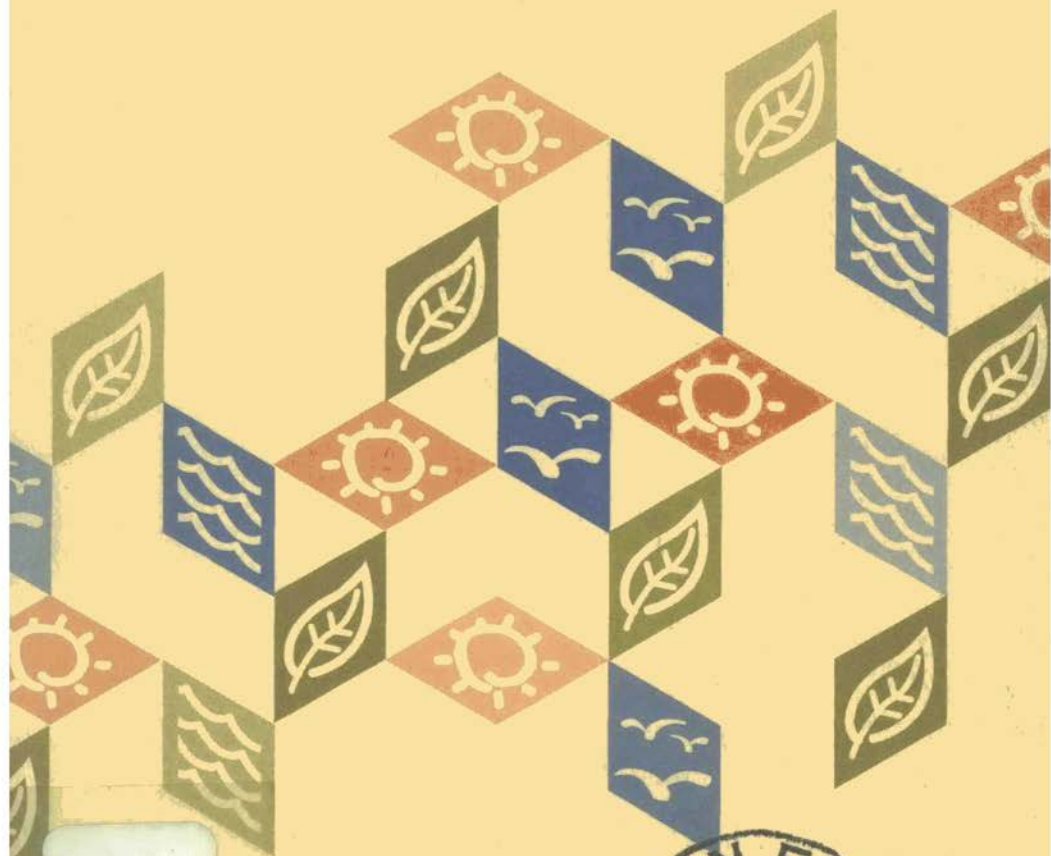


1

Trade and Sustainable Development

By Robert Repetto



**Environment
and Trade**

United Nations
Environment Programme

Trade and Sustainable Development

by Robert Repetto

From an economic perspective, both trade liberalization and environmental protection are inherently important. Trade liberalization allows countries to specialize in producing goods and services in which they have the comparative advantage, allowing consumers to purchase goods and services from countries that produce them most efficiently. Environmental protection ensures the full incremental costs of production and consumption are reflected in the decisions that producers and consumers face. The goal is to combine both trade liberalization and environmental protection to promote sustainable economic development.

United Nations Environment Programme

**United Nations
Environment Programme**

The United Nations Environment Programme was launched by the UN Conference on the Human Environment, held in Stockholm in 1972. Its mandate is to catalyze and coordinate activities to increase scientific understanding of environmental change and develop environmental management tools. Among its milestones over the past two decades is the creation of *Earthwatch* to gather, analyse and convey information about the state of the global environment. In the form of environmental management tools, UNEP's efforts have led to conventions to protect stratospheric ozone, to control the transboundary movement of hazardous wastes and to protect the planet's biological diversity, among others.

Environment and Trade Series

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Foreword

The 1992 "Earth Summit" found common ground upon which human development can be put on an environmentally sustainable footing. In 1993, completion of negotiations for the Uruguay Round set the course for a further liberalisation of international trade. One of the most pressing and complex challenges facing our generation is the search for a workable synthesis of the two, of economic relations and environmental realities.

We must embark upon this course, not because it is easy, but because it is necessary. Our planet's ecological vital-signs continue to warn us of an accelerating rate of degradation -- depletion of the ozone layer that shields us from harmful solar radiation, erosion of productive soils needed to grow food, contamination of freshwater with hazardous wastes, depletion of fish stocks, the massive loss of biodiversity, the threat of climate change and global warming.

An important challenge identified at the Earth Summit is ensuring that trade and environment are "mutually supportive." It is hoped that this series, providing analysis on selected environmental issues of relevance to the environment - trade debate, will contribute to the search for solutions now underway.

Elizabeth Dowdeswell
Executive Director

The Author

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1

Introduction

THERE'S NO DOUBT THAT INTERNATIONAL TRADE LIBERALIZATION has been crucial to economic success. This is most obvious in the Asian region. The so-called Asian "tigers", which have sustained high rates of economic growth for decades, have provided the model for outward-looking development strategies. More recent converts to open trade regimes in Southeast and South Asia refute the often-repeated contention that the expe-

rience of the "tigers" is not replicable, or could not be generalized to all the developing world. Table 1 shows Indonesia, Thailand, and Malaysia have also achieved remarkable growth rates in exports, manufacturing output, and aggregate income.¹ Perhaps even more striking are the high growth rates achieved in China, by far the largest East Asian developing countries. Trade liberalization has been only a part of China's economic reforms, but liberalization, in addition to its direct benefits, has provided essential support for price rationalization, private sector development, openness to foreign capital and technology, and other policy reforms. The question is whether trade liberalization also supports the goal of environmentally sound and sustainable economic development.

Table 1
Growth in East and Southeast Asia

AVERAGE ANNUAL GROWTH RATE (percent)

	Exports		GDP		GNP/cap.	
	1970-80	1980-91	1970-80	1980-91	1960-80	1980-91
Hong Kong	9.7	4.4	9.2	6.9	6.8	5.6
Singapore	4.2	8.9	8.3	6.6	7.5	5.3
S. Korea	23.5	12.2	9.6	9.6	7.0	8.7
Indonesia	7.2	4.5	7.2	5.6	4.0	3.9
Thailand	10.3	14.4	7.1	7.9	4.7	5.9
Malaysia	1.8	10.9	7.9	5.7	4.3	2.9
China	8.7	11.5	5.2	9.4	N/A	7.8

“Even partial economic accounting for resource degradation and depletion in developing countries suggests that the costs are large - of the order of 4-5 percent of GDP per year.”

2

The Effects of Trade Policy on the Environment

Trade Liberalization

It is indisputable that outward-looking trade policies have had significant environmental effects. Trade expansion has led to rapid growth in export-oriented industries. The composition of exports has varied across countries and over time, depending on the resource endowment and stage of industrialization. At the early stages of export expansion, internationally com-

petitive industries have been mostly labor-intensive processing and assembly operations, or downstream processing of local raw materials. Extractive and processing industries generate large quantities of wastes. At later stages of industrialization, exports have included a larger proportion of machinery, industrial materials, and products with higher technological content. Many such industries produce large quantities of hazardous wastes.

Export-led growth has also engendered rapid expansion of industries providing intermediate industrial materials and equipment, and of industries — energy industries, in particular — serving the domestic market. Energy industries have many serious environmental impacts. Industrial employment opportunities have drawn migrants to the cities, contributing to rapid urbanization. Rising incomes have brought construction booms and a virtual explosion in motor vehicle traffic. All these growth-related phenomena have in the aggregate generated new and increased environmental pressures.¹

In Thailand, for example, rapid industrial growth has raised hazardous waste generation to 1.9 million tons per year in 1990, and industry's share has doubled to 58 percent in a decade. A four-fold increase in the volume of hazardous waste is expected by 2001. Conventional biodegradable industrial wastes are also rising rapidly, severely polluting rivers and estuaries. Until recently, the government of Thailand did not insist that new investments include adequate emissions controls.

Energy consumption is growing at 8 percent per year, faster than GDP, and Thailand is shifting toward domestic lignite, a very dirty fuel, for electricity generation, with unfortunate implications for air quality. Bangkok already exceeds WHO health standards for several air pollutants. Lead, mainly from vehicle emissions, is found in blood samples at levels three

times higher than in the U.S. and Europe, increasing risks of strokes in adults and mental retardation in children.²

Rapid industrialization in China, much of it associated with increased openness to international trade, has generated similar problems. Industrial wastewater discharges more than doubled in the latter half of the 1980s, far outstripping treatment capacities and heavily polluting surface and groundwaters. Consequently, most of the urban Chinese population depends on unsafe drinking water, with severe health consequences. For example, a massive epidemic of hepatitis A in Shanghai afflicted 300,000 people.

Rapidly increasing energy generation from coal, three-quarters of which is for industrial or electric power use, has led to some of the world's highest concentrations of fine particulates and sulphur oxides, some of the most acidic rainfall in the world, and chronic obstructive pulmonary disease five times more prevalent in urban populations than in the United States. Problems of untreated and improperly discharged toxic and hazardous wastes are also of great concern to drinking water supplies and fisheries.³

In Indonesia, industrial output has increase 8-fold since 1970 and is expected to grow another 13-fold by 2020. Three-quarters of all industry is located on the small island of Java, 60 percent in urban areas. Industrial and household effluent loadings have grossly polluted most urban surface and groundwater supplies. Consequently, even after treatment, most drinking water supplies are contaminated. Rapid growth of energy use, especially by vehicles, has degraded urban air quality beyond health limits: in Jakarta, for example, 28 percent of women and children suffer from respiratory disease. Projections of future industrialization suggest that total emissions of conventional air and water pollutants will increase six-fold over the next twenty years.⁴

These growing environmental problems by no means imply that trade liberalization and its associated outward-looking development strategy have been a mistake or are inconsistent with sustainable development. Outward-looking strategies, especially in the Asian region, have dramatically reduced poverty and raised living standards for a large fraction of the world's population. They have provided the financial resources, technological capabilities, and institutions with which environmental problems can be managed. By raising living standards and strengthening communications, they have also created social and political conditions in which people demand environmental improvements.

The challenge is to ensure that newly created resources and capabilities are used to contain and diminish environmental pressures. Countries that are industrializing rapidly with access to international technologies are in a decidedly advantageous position, in that a large part of their capital stock is relatively new. New plants can readily incorporate up-to-date process technologies that use materials and energy more efficiently, minimize emissions, improve product quality and reduce costs. The costs of building environmental controls into new plants are much less than the costs of retrofitting pollution abatement equipment onto old plants. Companies are more willing and able to meet strict emissions standards when building new facilities. For example, most first-rank multinational companies' policies are to build overseas facilities to their own environmental standards or the host government's, whichever is higher. Countries that apply demanding environmental standards to new investments can rapidly improve the environmental performance of an industry.⁷

* Competitive pressures on environmental standards are discussed below.

Rapidly industrializing countries can control environmental degradation if they apply effective environmental regulations, provided they are consistent, reasonable, and enforced effectively and even-handedly. Most firms can reduce emissions substantially at modest cost. Even in OECD countries, where regulations are strict, pollution control costs rarely exceed two percent of the value of sales. Problems are encountered in industrializing countries because standards are vague; monitoring is inadequate; and enforcement is lax, discriminatory, or sometimes non-existent.

Land use regulations can also go far to minimize environmental degradation, but are weak in many developing countries. With effective land use controls, ecologically vulnerable and vital areas can be protected, environmentally damaging activities can be restricted to locations where they do the least harm or where their effects can be mitigated more easily, and residential development can be kept apart from potential exposure to environmental hazards. However, even where elaborate urban and regional development plans and land use guidelines have been drawn up at substantial expense, implementation is often inadequate. Industrial locations — especially of small and medium enterprises — are typically haphazard; zoning regulations are weakly enforced; and supposedly protected areas often are not.

In many rapidly industrializing regions, infrastructure development is unbalanced. For example, many such regions have no safe and approved facilities for the collection, treatment, storage and disposal of hazardous wastes. In such regions, although the chemicals, metal fabricating, fabric finishing, and other industries that generate significant volumes of hazardous wastes are growing rapidly, there are no environmentally sound facilities to receive those wastes. Consequently, they are stored or disposed of improperly on land or into water

bodies. The resulting poisoning of aquifers and sediments is difficult or impossible to remedy, and may produce long-lasting damages to human health or ecological systems.

Similarly, development of urban infrastructure to serve the rapidly growing urban population in such regions lags behind. Water and sanitation facilities remain inadequate for much of the expanding population. Urban transportation infrastructure is overwhelmed, leading to growing costs of congestion and air pollution.

In effect, countries suffer from underinvestment in institutional capacity and infrastructure for environmental management. The problem is one of underinvestment, in that the averted damages and costs would generously repay the needed expenditures. It is often implicitly overlooked that the costs of environmental degradation, in terms of increased sickness or reduced productivity, are real costs to the economy, although they may not be adequately captured by market valuations.

Trade economists are fond of pointing out that trade restrictions are not the first-best measure with which to address environmental market failures.⁵ The best approach is to tackle the market failure at its source, through appropriate environmental regulations, policies, or infrastructure investments. While this proposition is undoubtedly true in theory, few countries that have experienced a rapid growth spurt fueled by trade liberalization have adequately invested in environmental management or established effective regulations.

It is also true that the second-best policy, in the absence of effective domestic environmental policy, is not necessarily to go ahead with trade liberalization anyway.⁶ The increased environmental damage generated by expanded exports might outweigh the increased gains from trade. This is not merely a hypothetical theoretical curiosity. Even partial economic accounting for resource degradation and depletion in devel-

opening countries suggests that the costs are large — of the order of 4-5 percent of GDP per year.⁷ Country case studies of previous trade liberalization programs suggest that the expansion of export sectors, absent effective domestic policies, can exacerbate these damages significantly.⁸

The implications for development institutions, such as the Asian Development Bank, seem clear. In order to ensure that rapid export-led growth in the region is environmentally sound and the potential economic gains from trade expansion are realized, increased investments are required to strengthen institutional capacity and to provide necessary infrastructure. These investments should be made in anticipation of export-led growth, because the costs of preventing environmental degradation are much less than the costs of remediation, or environmental degradation's economic damages. Unfortunately, decades of underinvestment in environmental protection and significant unmet needs for infrastructure and institutional strengthening let damages accumulate.

Trade Restriction

The argument that environmental protection has been neglected should not be interpreted as an attack on the outward-looking development model.⁹ Continued inward-looking, trade-restricting development policies might have produced equally serious environmental problems along with significantly lower living standards. Certainly, China in the years prior to economic reform experienced severe environmental degradation.¹⁰ Inefficient state-owned heavy industries generated enormous pollution. Misguided centrally-planned management of agriculture, forests, and other sectors led to severe resource degradation.

Similarly, India, which has only begun to dismantle its inward-looking development regime, has experienced slow

growth in incomes and substantial environmental degradation. Much of this degradation stems from the persistence of widespread rural and urban poverty. In the industrial sphere, obsolete technologies, overemphasis on highly polluting heavy industries, financial constraints, and lack of effective environmental controls, have combined to produce pollution problems.¹¹ By comparison to the Indian experience, outward-looking development has more rapidly increased the resources, technological and institutional capabilities with which environmental problems can be addressed.

Trade restrictions in the OECD countries also have adverse environmental and economic consequences, for their own societies as well as for their Third World trading partners. Tariff escalation by the stage of processing inhibits the development of finishing industries that add value to raw materials produced in the South. The Multi-Fibre Agreement and other trade barriers impose serious quantitative restrictions on exports of labor intensive manufactures from developing countries. Such barriers affect not only textiles and apparel, but also footwear and other relatively labor-intensive products. By impeding the access of low-cost producers with comparative advantage in these manufactures to industrial country markets, these restrictions substantially lower incomes in developing countries and raise consumer prices in industrial countries. In the 1980s, American consumers paid about \$18 billion per year in excess costs just for clothing and textiles, for example.¹² Protection reduces potential employment in developing countries but has done little to save jobs in industrialized countries, where producers have rapidly automated production to raise productivity.¹³

At the same time, these trade barriers exacerbate environmental pressures in developing countries by forcing them to intensify exports of natural-resource based commodities.

Most newly industrializing countries have a comparative advantage in the production and export of labor-intensive or resource-intensive commodities, but can't compete in high-technology or capital-intensive industries. In the late 1980s about half of all developing country exports still comprised fuels, minerals, and other primary commodities. By impeding exports of labor-intensive manufactures and downstream processing industries, especially when pressures on developing countries to meet high debt-servicing requirements are intense, these trade barriers virtually force developing countries to raise exports of natural-resource based commodities. Eliminating these trade barriers would have significant economic and environmental benefits. Output would expand in labor-intensive processing industries, enabling developing countries to add more value to their exported primary materials. Growth of alternative sources of foreign exchange earnings would mitigate the overexploitation of natural resources for export.

Trade restrictions imposed by OECD countries also damage their own environments, while reducing incomes domestically and abroad. Agricultural protectionism in Europe, the United States, and Japan leads to much more intensive farming in these regions than is environmentally or economically justified. By inflating prices and per acre revenues, while (in some cases) limiting the acreage that can be planted, agricultural policies induce farmers to use more inputs on each acre planted than they otherwise would. Driven by these incentives, farmers adopt chemical-intensive monocultures that lead to more soil erosion, chemical runoff, loss of biological diversity, and conversion of once-natural ecosystems to cropland than would otherwise take place.¹⁴

These domestic agricultural policies are supported by barriers to imports and subsidies to exports — trade distorting

measures that impose heavy costs on domestic consumers and taxpayers, as well as on third-country producers. Within the OECD countries, agricultural protectionism costs consumers and taxpayers around \$150 billion annually, more than double what farmers in these countries gain.¹⁵ Current policies grossly distort world agricultural trade patterns, sacrificing static gains from trade of roughly \$70 billion annually in the OECD countries alone.¹⁶ In addition, lower world prices depress returns to developing country and other exporting country producers, inhibit badly needed investments in agriculture in those countries, and result in the spread of low-yielding farming and ranching into ecologically vulnerable tropical forests.

Sugar Protectionism: A Case Study

U.S. protectionism against sugar imports is an egregious example. Domestic price supports linked to a tariff-quota system keep U.S. sugar prices two to three times world levels and have reduced imports, predominantly from developing countries, by three-quarters since the 1970s. The sugar industries in Caribbean Basin and other low-income countries have been crippled, with a loss of 400,000 jobs in Caribbean countries alone.¹⁷

These levels of protection are equivalent to a subsidy to U.S. producers of 60-79 percent, and a tax on U.S. consumers of 43-59 percent.¹⁸ The industry in the U.S. is highly concentrated. Thus, the largest 1 percent of producers obtain 58 percent of all producer benefits, — more than a million dollars per producer per year — and the largest 10 percent obtain more than 80 percent.¹⁹ Large producers also benefit from subsidized irrigation and flood control works. The welfare cost to U.S. consumers has been estimated in various studies to fall between 1 and 4 billion dollars per year. The overall economic loss, net of benefits to U.S. producers, probably lies between

100 million and 1 billion dollars per year. The sugar protection program is a highly inefficient means of transferring income to large U.S. growers and processors from sugar producers in low-income countries and average U.S. consumers.

The environmental consequences are most dramatic in South Florida, where water and chemical uses by Florida sugarcane growers have imperilled the unique Everglades ecosystem. Two large companies are responsible for the entire crop in the Everglades Agricultural Area. The Everglades is a freshwater wetland of marshes, wet prairies, swamps, and tree islands. Described as a "River of Grass", it once flowed in a 65x170 km basin from the southern shore of Lake Okeechobee to the mangroves on Florida's southwestern coast. Rainfall, formerly the main nutrient source, provided a slow, continuous sheetflow through the basin into Florida Bay, feeding North America's only living coral reef and a tremendous diversity of marine life.²⁹ Since the turn of the century, 65 percent of this wetland has been drained; the sheetflow has been channelized and diverted; water quantity and quality have drastically decreased; and severe ecological deterioration has occurred.

Only about one-half of the original Everglades ecosystem remains, divided into three Water Conservation Areas and the Everglades National Park. The Park, — a Biosphere Reserve, World Heritage Site, National Wilderness Area, and Wetland of International Significance — supports sixteen endangered species, including wood storks, snail kites, Florida panthers, and American crocodiles. This remnant is threatened by sugar producers in the Everglades Agricultural Area to the north, formed by draining and irrigating nearly one-third of the original Everglades. Without major changes in water management and agriculture, the remaining Everglades could become an oxygen-starved cattail marsh supporting none of the origi-

nal diversity of plants and animals. The downstream mangroves and estuaries could continue disappearing until the well-spring of Florida Bay's reefs and fisheries are gone.²¹

Because water has been diverted for irrigation and urban use, the Everglades now receives less than half its historic flow, and instead of a long-continuous flow of rainwater, stagnant water is released from impoundments in massive pulses in the wet season and the marsh lacks water in the dry season. Drainage water from the agricultural area is massively enriched by fertilizers and nutrients released from exposed soils to a concentration hundreds of times higher than natural background levels. The sawgrass-dominated wetland ecosystem, adapted to a nutrient-poor environment, is taken over by phosphorus-tolerant cattails, which have already intruded far into the National Park. The cattails choke the aquatic ecosystem, disrupting the food chain and extinguishing species at all trophic levels, including the snails, shrimp, insects, crustaceans and fish. Higher on the food chain, the population of wading birds has already declined by 93 percent since the 1930s, for lack of food and nesting sites. With enough nutrient enrichment, a foul-smelling, anaerobic mat of green filamentous algae takes over, in which only cattails and few other species can survive.²²

The likely extinction of the Florida panther, of which only 30 to 50 individuals now survive, is due partly to food chain disruption but mainly to bioaccumulation of mercury deposited in ash from burned sugarcane fields and bagasse and released from exposed peat as it oxidizes. Infant mortality from mercury poisoning in these top predators is high. In the Bay, high salinity and temperatures caused by interruption of freshwater flows have produced massive seagrass die-offs and algal blooms, lowering dissolved oxygen levels and killing corals, sponges, and other marine animals. The shrimp har-

vest has fallen 80 percent in the last decade, destroying an important commercial fishery.

Attempted solutions have focussed on complex water and nutrient management systems, rather than the fundamental problem: highly uneconomic sugarcane production by large, heavily protected corporations. If sugar price supports and protectionist barriers to imports are dropped, and the industry faced is forced to pay the full costs of its water and drainage works, sugar production in South Florida (and other high cost producing areas) will fall dramatically. Consumers will benefit; efficient foreign producers will benefit; and the principal threat to the Everglades will be resolved. This is a prime example of complementarity between trade and environment objectives. Trade liberalization accompanied by strengthened environmental protection and better resource management can be a "win-win" option for countries in the North and South.

“...the question of competitiveness should be addressed not at the level of the individual firm, nor on the level of the individual industry, but at the level of the entire economy.”

3

The Effects of Environmental Policies on Trade

The “Competitiveness” Issue

Firms in OECD countries fear that competitors in developing or transitional economies where environmental standards are less stringent or less strictly enforced derive an advantage in the marketplace from lower compliance costs. Labor unions in OECD countries fear that companies will relocate factories in developing countries to take advantage of lax environmental

standards. Simultaneously, firms in developing countries fear that if they are forced to meet environmental standards as strict as those in OECD countries, then they will be unable to compete in the marketplace because of higher production costs.

To some extent, such professed fears are designed to bluff, intimidate, or otherwise influence government decisions regarding environmental standards. Companies have always used the threat of reduced employment or investment to deter governments from setting strict standards, oftentimes successfully. Governments must, therefore, examine carefully the basis for such implicit threats. Similarly, some environmental groups oppose trade liberalization because they fear that with lower trade barriers, the risk of competitive dislocations will force environmental standards in OECD countries down to some least common denominator. They, too, must examine the basis for such fears.

First, should potential competitive effects be judged at the level of the firm, the industry, or the total economy? Although the individual businessman making representations on environmental policy is interested primarily in the competitiveness of his own company, this is too narrow a base for public policy. An interesting case study of the Indian leather industry illustrates why this is so.¹

Exports of Indian leather and leather goods, mostly to the EC, have increased rapidly and are expected to continue to do so. Much of the tanning industry, however, still consists of small establishments using backward technologies. Less than 25 percent of such tanneries treat their effluents before discharging them into rivers or evaporation ponds. These practices impair the health of workers and neighboring residents, salinize adjoining farmlands, contaminate aquifers, and lead to the discharge of organic wastes and chromium, a toxic

metal, into surface waters. Producers of Indian leathers are being forced to change their tanning processes to meet European product standards that forbid the contamination of leathers with pentachlorophenol, a toxic fungicide, and the use of dyes containing formaldehyde and benzidine. Indian leathers are also subject to packaging and labelling regulations. In addition, producers are being forced by Indian environmental regulations to install individual or common waste treatment plants.

The estimated cost impacts of these measures range from 1.5 to 3.0 percent of finished product prices on average, but they affect different segments of the industry quite differently. Small tanneries using backward technologies, located around urban areas, are the most seriously affected. Larger modern tanneries, which under a liberalized trade policy are able to import modern equipment and processing chemicals to produce a consistently higher quality product with fewer effluents, are able to capture a growing share of the market. Leather manufacturers, who can now import leather required for production of higher quality products at a labor cost advantage, are least affected.

Clearly, evaluating the competitive effects of Indian process standards and European product standards at the level of the individual tannery is inadequate. Both sets of standards are contributing to the modernization of the industry, accelerating the replacement of small, inefficient, unsafe and highly polluting establishments. Such establishments and their workers may be losers from the change, but other, more efficient, Indian firms are gainers, and overall, output and employment in the industry are increasing. As modern technologies replace older ones, productivity and quality of product are improving, and environmental damages can be controlled.

However, evaluating competitiveness effects at the level of

the industry is also too narrow. Other segments of the Indian economy have suffered substantial costs as the result of environmental spillovers from the leather industry. First of all, the 1.4 million people working in the industry, mostly low-paid women and children, are exposed to unsafe levels of toxic, carcinogenic, and potentially lethal chemicals, including ammonia, formaldehyde, and hydrogen sulfide — and suffer numerous health impacts. It is hardly acceptable to say that in order for the industry to remain competitive, the lives of those who work in it must be put in jeopardy.

Furthermore, the land and groundwater supplies of the surrounding villages have been poisoned by salts and other effluents, so that they are unfit for any other use than as dumping grounds for the tanneries. The livelihoods of the inhabitants have been destroyed. Finally, every year the establishments located in Uttar Pradesh discharge, along with other wastes, at least 10,000 tons of chromium into the river Ganges, which is not only the source of drinking water for millions of people but also sacred to hundreds of millions of Hindus.

It would be inconsistent for a government dedicated to poverty alleviation and development to ignore these significant costs to its own people. For this and other reasons, the question of competitiveness should be addressed not at the level of the individual firm, nor on the level of the individual industry, but at the level of the entire economy. The costs of pollution abatement forced on the industry are real costs to the Indian economy, but so are the costs of illness, loss of productive land, and pollution of ground and surface waters.

Even viewed from the perspective of a single industry, to what extent are environmental control costs likely to shift competitive advantage in world trade? It is conventional in this regard to make a distinction between product standards, which refer to the physical characteristics or composition of

the traded item or its packaging, and process standards, which refer to the way in which it is manufactured, including the extent and composition of residual emissions. It has long been held under GATT rules that importing countries are free to regulate products entering their borders to protect health, safety, or natural resources, so long as such regulations treat domestically produced goods and imports alike, do not discriminate among foreign sources, are not covert protectionist measures, and are not arbitrary barriers to trade. It has generally been held under GATT rules that countries are not free to regulate the processes by which imported goods are made, since that would treat identical products made by different processes differently and violate the exporting country's sovereign right to set its own health and safety standards.

Of course, as the Indian tannery example illustrates, the distinction between product and process standards is becoming less and less sharp. Since sensitive tests of the product can recognize minute residual amounts of materials used in the processing, regulations banning those trace chemicals can force exporters to alter their production methods. Other product regulations, such as those governing recyclability, energy efficiency, or the tolerable amounts of pollutants a product can emit when used, can also force manufacturers to redesign industrial goods and the processes used to make them.

It is safe to predict that international differences in process standards will have small competitive impacts in world trade, because even in the U.S., where regulatory standards are strict but not particularly cost-effective, pollution control costs average only about 1.5 percent of the value of the total sales of manufacturing industries. Only in a very few sub-sectors do they rise above 3 percent of the value of sales.⁷ Thus, even if environmental controls brought no benefits whatever to the

firm itself through reduced materials and energy use, or reduced liability or worker disability; and even if competing firms in other countries incurred no environmental control costs at all, the resulting cost disadvantage to American firms would be less than 2 percent of sales price for the large majority of industries. Compared to other competitive factors in international trade, such as differences in labor, transportation or materials costs, differences in productivity and product quality, or differences in brand recognition and marketing ability, differential environmental control costs stemming from varying environmental process standards are unlikely to be noticeable, let alone decisive.

The parallel fear that companies will relocate their operations to “pollution havens” is equally implausible. The idea that a company will move its production — a step that involves selling its plant, severing its workforce, persuading key personnel to relocate, acquiring a new site, building a new facility, recruiting and training new workers, and undergoing a shakedown period for a new plant — only to save pollution control costs totalling less than 2 percent of sales absolutely strains credulity. When companies move their plants, other forces are at work.

These a priori predictions are borne out by many empirical studies, dating back two decades and extending up to the present.³ Hardly any of them find that differences in regulatory stringency or environmental control costs are at all useful in explaining patterns of international trade and investment, or changes in the location of production. The gross facts bear out these statistical findings: Japan and Germany, two countries with strict environmental standards, have never proven to be uncompetitive in international trade; India and the former Soviet Union, despite weak or ineffective environmental standards, have been strikingly uncompetitive in world markets.

Obviously, other factors are determining the market outcomes. Although there are some reported cases of firms seeking out overseas production locations with weak environmental standards, by far the greatest amount of direct foreign investment is in countries that have high environmental standards.

Indeed, there is evidence that lax environmental standards can act as a deterrent to foreign direct investment. For example, Western firms have been unwilling to buy industrial plants in some heavily polluted regions of Eastern Europe at any price, because the potential liability for clean-up costs outweighs any reasonable expectation of profit. Regions interested in attracting industrial investment would do better by simplifying economic regulations, improving infrastructure and communications, and ensuring a stable economic, legal and political climate than they would by abandoning environmental standards.

Although it would be irrational for developing countries to forego reasonable environmental controls, it would be equally irrational for Northern environmentalists to demand that developing countries should adopt the same process standards as OECD countries have. For one thing, identical process standards in two settings will not achieve the same degree of environmental quality: other factors, such as the concentration of emissions sources and the assimilative capacity of the environment, also matter. In any case, rational developing countries will not have the same priorities for environmental quality as rich countries have. For example, fear of carcinogens looms large in U.S. environmental regulations, since cancer is a leading cause of death in an aging population. However, in most developing countries, with a much younger age structure and high mortality rates from poverty-related diseases, cancer is a relatively minor cause of death. Furthermore, the effectiveness

of environmental measures will vary between developed and developing countries. Would the ambitious and expensive goal of zero discharges for industrial plants, embodied in the U.S. Clean Water Act, make sense in India, where less than 20 percent of household sewage is even collected, let alone treated, and surface waters are highly contaminated with household wastes? Finally, imposing the same process standards on different plants would not “level the playing field” in a competitive sense anyway, since the compliance costs will vary significantly across plants according to their age, layout, and technology. The principle that national sovereignty in the design and implementation of domestic environmental standards is sound and should be respected.

Process Standards, the Polluter Pays Principle, and the Terms of Trade

Governments of OECD member countries agreed to the Polluter Pays Principle twenty years ago to avoid trade displacements and distortions that might result if some governments subsidized industries’ costs of compliance with environmental standards while others made the polluters pay. This principle has been useful, even though applied only spottily within the OECD. Non-OECD countries have not universally adopted even the principle, let alone the practice.

There are many reasons why they should do so. Developing country governments do not have the fiscal capability to subsidize pollution control expenditures to any great extent, and there are far more worthy potential beneficiaries for limited government funds. The polluter pays principle will complement market liberalization programs underway in many developing countries, by ensuring that prices include the full incremental costs of production, including environmental costs. There would be an additional economic benefit to

developing countries. Developing country trade experts have long maintained that demand for their natural-resource based exports is price-inelastic. This is so, at least in the short or medium term. Table 2 provides estimated price elasticities of demand for a large number of traded commodities. If the price elasticity of demand for a commodity is less than one in absolute value, an increase in the commodity's price will increase sale revenue. Moreover, Table 3 shows that production of many internationally traded commodities is concentrated in developing countries. For this reason, Third World commodity countries have long attempted — with little success — to form commodity agreements or international associations to restrict supply and push up export prices and earnings, often in the name of price stabilization.

If developing countries collectively adopted reasonable environmental process standards in commodity producing industries and adopted the Polluter Pays Principle, the damage to their own natural resources would be curtailed, and the cost of environmental compliance would be internalized in the prices of their exports. Certificates and labelling systems indicating the use of sustainable and environmentally production methods, if organized by Third World producer groups, would support collective standards.⁴ Their terms of trade would improve, because Northern consumers, whose demand is relatively insensitive to price, would be paying a larger share of the environmental costs associated with their consumption patterns. To illustrate if environmental control costs averaged roughly 1.5 percent of production costs, as they do in the US, then the \$500 billion in annual exports from developing countries would include payments of up to \$7.5 billion by importers, mostly in the North, to help defray the costs of environmental controls. This sum is far greater than the annual flows of development assistance to the South for environ-

mental programs. It should be a high priority for commodity associations such as the International Tropical Timber Organization, and for international trade forums such as UNCTAD, to promote agreements among Third World commodity exporters that they will adopt environmentally sound and sustainable production standards and apply the Polluter Pays Principle.

Table 2
World Elasticity of Demand for LDC Export Commodities

Agricultural Commodities	
Coffee	-0.27 ^a
Cocoa	-0.19 ^a
Bananas	-0.40 ^a
Tea	-0.20 ^b
Rubber	-0.50 ^b
Sugar	-0.04 ^b
Cotton	-0.18 ^b
Palm Oil	-0.47 ^b
Non-Agricultural Commodities	
Phosphate Rock	-0.70 ^b
Tropical Timber	
Non-conifer logs	-0.16 ^c
Non-conifer sawnwood	-0.74 ^c
Non-conifer plywood	-1.14 ^c
Non-ferrous Metals	-0.55 ^d
Ferrous Metals	-0.65 ^d
Aggregate Energy	-0.50 ^d

^a N. Islam and A. Subramian (1989). Agricultural exports of developing countries: estimates of income and price elasticities of demand and supply. *Journal of Agricultural Economics* 40:1, 221-231.

^b Demand from developed countries only. MVDI Karunasekera (1984). Export taxes on primary products: a policy instrument in international development. *Commonwealth Economic Papers*: No. 19. Commonwealth Secretariat, London. (Annex Table 2, p. 53)

^c E. Barbier, I. Burgess, J. Bishop, B. Aylward and C. Bann (1992). The economic linkages between the international trade in tropical timber and the sustainable management of tropical forests. [draft] London Environmental Economics Centre, International Institute for Environment and Development. (Table 4.6, p. 31)

^d M.E. Slade (1992). "Environmental Costs of Natural Resource Commodities: Magnitude and Incidence." World Bank working paper for World Development Report.

Table 3
 Developing Country Share of World Trade
 in Major Primary Products during late 1980's
 (in percentage terms)

Primary Commodity	Share in World Gross Exports	Six Largest LDC Exporters' Share of World Exports
Coffee ¹	89.0	53.0
Cocoa ¹	90.2	78.4
Tea ¹	82.1	73.8
Sugar ¹	74.8	65.2
Beef ¹	14.8	8.1
Bananas ²	93.1	75.9
Citrus Fruits ²	48.5	43.0
Rice ¹	58.7	50.1
Soybeans ¹	24.8	24.6
Copra ¹	90.8	79.7
Groundnuts ¹	52.1	44.7
Palm Oil ¹	77.9	76.9
Cotton ²	54.6	24.3
Jute ²	95.1	75.5
Sisal & agaves ³	96.6	95.2
Rubber ¹	97.4	93.3
Tobacco ²	62.2	42.1
veneer/sawlogs ²	85.3	70.7
sawnwood ²	66.0	56.2
Bauxite ¹	90.1	80.0
Copper ¹	70.0	54.4
Iron Ore ¹	59.8	41.0
Lead ¹	34.6	27.8
Manganese Ore ³	83.5	56.9
Nickel ¹	37.3	30.0
Tin ¹	77.8	73.4
Zinc ¹	29.5	22.6
Phosphate Rock ¹	72.4	63.4

¹ 1985-87 average for "low- and middle-income economies." From World Bank (1993). Commodity Trade and Price Trends, 1989-91 Edition.

² 1988 figures. From World Bank (1990). Price Prospects for Major Primary Commodities.

³ 1989 figures. From UN FAO (1991). Trade Yearbook, Vol. 45.

Product Standards and “Green Protectionism”

Many developing countries fear that environmental product adopted by advanced countries will be serious barriers to trade, either because they are designed and applied as protectionist measures or simply because they are too strict for Third World producers with limited technology to attain. Although there is indeed a persistent tendency to use product standards and regulations — not just environmentally motivated ones — to protect domestic producers, fears of “green protectionism” are exaggerated.

Safeguards against product standards becoming non-tariff trade barriers are needed, included such disciplines as those in the GATT text barring standards that are arbitrary, discriminatory or disguised protectionist measures. Trade dispute mechanisms are needed so that injured parties can appeal to impartial bodies for redress. These safeguards must draw the line between legitimate environmental regulation and protectionism.

However, recent GATT decisions have shifted this line to limit unduly the scope of environmental policy.⁵ Trade officials have interpreted the GATT text to be far more restrictive of environmental policy than that agreement was originally intended to be. They have, in effect, changed the GATT agreement through interpretation to circumscribe national discretion in setting environmental policy.⁶ Notably, GATT dispute resolution panels have placed the burden of proof in disputes over environmental standards on standard-setting countries to justify their environmental measures. This interpretation in itself weakens the presumption that countries are entitled to set their own national environmental standards and policies.

In a dispute over Thailand’s restrictions on cigarette imports, a panel ruled that measures for the protection of human health must be “the least GATT-inconsistent” of all

available environmental measures. A variant, requiring such measures to be "the least trade-restrictive" has been used in other GATT trade disputes and in the Dunkel draft Standards Code. However, the GATT text does not require that measures necessary to protect life and health be the least GATT-inconsistent or the least trade-restrictive of international trade of all measures available. This criterion might call into question many existing environmental regulations, on the grounds that they are not the least trade-restrictive of available measures. Under most circumstances, for example, a pollution tax would be less trade-restrictive than a command-and-control regulation or ban, but the former are rarely adopted by environmental policymakers.

The recently negotiated NAFTA text and side-agreements provide an improved model for safeguarding both trade and environmental protection. For example, NAFTA shifts the burden of proof to the party challenging a nation's environmental standards to demonstrate that they are arbitrary, discriminatory, or protectionist. It also allows for the use of panels with environmental expertise in dispute resolution proceedings. GATT dispute resolution procedures are flawed in that they make panels composed overwhelmingly of trade experts, with no environmental expertise, pass on the legitimacy of environmental regulations.

More important than safeguards against "green protectionism" written into trade agreements, there are broad and powerful economic forces at work to discourage the manipulation of product standards for protectionist purposes. They are summed up in the phrase "globalization of the world economy". A remarkably large and growing fraction of world trade consists of shipments between one branch of a company and another, or between a company and its foreign affiliate. As long ago as the mid-1980s, 52 percent of U.S. imports and 57

percent of Japan's were intra-company transactions of this kind.⁷ Intra-company trade is buffered against the protectionist manipulation of product standards. The Ford Motor Company, for example, has no incentive to keep the components made in its Mexican plant out of the United States, since it built or acquired the Mexican facility precisely to supply those components to its factories in the U.S. and probably in other parts of the world as well. Instead, it would want to resist impediments to shipments among the nodes in its worldwide production network.

A large additional share of world trade in manufactures consists of "outsourcing" by companies in advanced markets whose own capabilities lie in design and marketing. Benetton or Bloomingdale's, for example, have clothes sold under their labels manufactured all over the developing world by companies operating under contract. Contractors are held to strict specifications on design, materials, quality, and delivery time. They must also meet the environmental and other product standards in force in the import market. Clearly, Benetton and other importers have no incentive to manipulate such product standards to keep their contractors from selling into the importing market, since they have developed the "outsourcing" relationship precisely to find a low-cost and reliable supplier. In this way, globalization trends in the world economy provide a powerful countervailing force against the protectionist use of environmental product standards.

Some developing country producers may nonetheless find those standards hard to meet, and may thus be at a disadvantage to other firms, in the North or South, with more refined production processes or greater capital and technical resources. However, environmental standards are no different in this respect than product standards imposed by the importer with respect to quality or delivery time. Meeting

such standards is the competitive prerequisite for supplying a demanding market. Not all companies can do so. However, the virtual explosion of intra-company trade, "outsourcing", and South to North trade in industrial and manufactured products demonstrates that many Third World companies are able to manufacture to the high standards demanded by the importing market. For such firms, product standards are valuable guideposts, helping potential developing country exporters know what to do to break into advanced markets.

"Green protectionism" undoubtedly exists, but its extent is relatively small. In agriculture, which is probably more subject to covertly protectionist product standards than manufacturing, empirical studies have shown that less than 5 percent of shipments of fruits, vegetables, fish and shellfish to the U.S. are detained at the border for non-compliance with product standards. Of these, at most 15 percent were detained for environmental reasons, such as the presence of pesticides, heavy metals, or unsafe additives. A larger fraction were detained for ordinary quality defects, such as decomposition, presence of salmonella, or contamination by filth. Other more common reasons for rejection were improper labelling, and defective canned foods.* Thus, less than one percent of food shipments are rejected on environmental grounds, and these are overwhelmingly for non-compliance with unchallenged U.S. environmental standards.

Today, what threatens the world trading system and market access for developing countries is not "green" protectionism. It is ordinary "dirty brown" protectionism. The Uruguay Round could have well failed, and that would have severely weakened the GATT, the multilateral trading system, and progress in dismantling barriers to trade in textiles, food, and other products of concern to developing countries. The Uruguay Round was endangered primarily but not exclusively

by agricultural protectionism, especially in Europe and Japan. Agricultural protectionism is driven by concern not for the rural environment but for the rural vote. NAFTA almost didn't pass the U.S. Congress. Although some environmental groups in the U.S. opposed it, most would have been the opposition of the labor union movement fearful of competition in labor-intensive manufacturing processes, and agricultural interests subject to Mexican competition."

Trade barriers are not maintained today as a "second-best" approach to environmental protection, a widely accepted policy goal. They are maintained, as in the past, to protect the incomes of politically well-organized minorities at disproportionately high cost to the majority. The economic costs of so-called green protectionism to the developing countries are trivial compared to the costs of barriers erected in the North against labor-intensive manufactures such as textiles and apparel, and against competing agricultural commodities such as sugar or bananas. They are also tiny compared to the cost of barriers erected by developing countries to the expansion of South-South trade, or to the costs of biases in developing countries own trade regimes that reduce their ability to export. Concern over potential protectionist barriers created by environmental product standards is excessive, and deflects attention from much more critical trade issues.

“The prospect of substantially increased gains from trade and investment has induced the Mexican government to strengthen its **enforcement of its own environmental regulations** and to resolve the tuna-dolphin dispute.”

4

Sustainable Development Principles for Trade and Environmental Policy

IN MANY WAYS, LIBERAL INTERNATIONAL TRADE AND SUSTAINABLE development are complementary, or could be reconciled through changes in policy. There are many trade policy changes that would benefit the environment, and environmental policy changes that would help secure the benefits of liberalized trade. Implementing such changes would produce significant economic and environmental benefits. This

section identifies some important principles for integrating trade and sustainable development.

Reorient Agricultural Policy and Reduce Agricultural Protectionism in OECD Countries

As explained above, if the European Community, the United States and Japan succeed in liberalizing agricultural trade and decoupling farm income support payments from production decisions, they will raise farm productivity and consumer welfare significantly. In addition, they can reduce fiscal burdens, expand international trade, and improve environmental quality. Developing countries will improve their market access and terms of trade. This is a prime example of complementarity between development and environment objectives.

Reduce Barriers in OECD Countries to Exports of Labor-Intensive Manufactures from Developing Countries

There would be substantial gains from increased trade in both exporting and importing countries if tariff escalation that inhibits processing of raw materials before export were scaled back, and if non-tariff barriers against labor-intensive manufactures, such as the Multi-Fibre Agreement, were eliminated. These policy changes would reduce the pressure to over-exploit natural resources in developing countries.

Some of these complementarities are within reach. The Uruguay Round negotiators have made progress both in reducing agricultural protectionism and in increasing market access in OECD countries for labor-intensive manufactures from developing countries. NAFTA offers similar benefits for Mexico in North American markets.¹ Ensuring these gains by having concluded and ratified the Uruguay Round and NAFTA agreements, with adequate environmental safeguards, represents a step forward for environmental protection as well as for trade liberalization.

Use Trade and Investment Incentives to Induce Cooperation in International Environmental Protection

Using trade sanctions unilaterally or even multilaterally to discourage non-cooperation in international environmental protection activities is controversial. For example, the unilateral U.S. ban on Mexican tuna imports to protect dolphins in international waters led to a GATT dispute. The provisions in the Montreal Protocol that require signatories to ban imports of CFCs and products containing CFCs from non-signatory countries is a multilateral example.

Because of the poor record of compliance with international environmental agreements, and the long negotiations required to achieve even weak international agreements, a strong argument can be made that trade sanctions are needed to deter cheating or free-riding on an agreement, and that the threat of possible trade sanctions can be an essential incentive to induce parties to negotiate an agreement.

Many environmentalists fear that, if challenged, such trade measures could be regarded as inconsistent with GATT obligations, as the Tuna-Dolphin dispute panel suggested. On the other hand, many developing or small industrial countries fear that such policies might be used coercively by powerful nations to impose their own environmental standards or preferences on other countries. Although they may sometimes be necessary, trade sanctions are not the ideal measure with which to achieve international environmental cooperation because they rely on one costly measure (trade restrictions) to discourage another (non-cooperation in environmental protection). They hold out no guarantee that the result will be a net improvement in global welfare.

Sometimes, carrots may work better than sticks. Using trade concessions to elicit international environmental cooperation is much more likely to generate economic and envi-

ronmental gains and an overall improvement in welfare. The North American Free Trade Agreement may be an example. The prospect of substantially increased gains from trade and investment has induced the Mexican government to strengthen its enforcement of its own environmental regulations and to resolve the tuna-dolphin dispute. The potential gains have also induced the U.S. and Mexican governments to agree to spend substantially more on badly needed environmental protection in the border area.

This approach could be applied to a wider round of negotiations over a Latin American Free Trade Agreement, and incorporated into subsequent negotiating rounds under the GATT. The Uruguay Round has demonstrated that agreements on trade liberalization can be linked to negotiations over other issues, such as intellectual property rights. Why can't agreements on trade liberalization also be linked to negotiations over transboundary environmental protection?

Developing Countries Should Enforce Reasonable Environmental Standards and the Polluter Pays Principle

If developing countries adopt reasonable environmental standards and adhere to the polluter pays principle, they can ensure that pollution control and environmental costs are internalized into enterprise costs and product prices. The severe damages they are now suffering from environmental degradation will be mitigated. Trade disputes over hidden environmental subsidies and "eco-dumping" will be reduced. Concerns over the environmental consequences of trade liberalization will also be muted, because environmental control costs will be reflected in market prices.

Governments Should Eliminate Natural Resources**Subsidies**

Natural resources, such as water and energy, are very often underpriced in both industrialized and developing countries. These policies distort international trade, whether the subsidized resource is directly exported or used as an input in the production of exported commodities. At the same time, such natural resource subsidies result in extensive environmental damage by encouraging the oversupply and overuse of the natural resource in question. For example, water subsidies in the western US have led to severe environmental damages, including salinization of soils, contamination of wetlands, and reduction of fisheries and bird populations. Resource subsidies of this kind are often not considered to be “environmental policies”, but they significantly affect the use and management of natural resources. Eliminating them yields trade and environmental benefits.

In such Asian countries as Indonesia, the Philippines, and Papua New Guinea, failures by government to charge concession-holders adequate royalties for timber harvested on public forests have led to wasteful over-exploitation and ecological losses. At the same time, the public exchequer has been deprived of badly needed funds to finance development programs.² Austria and the Netherlands have proposed tariff or non-tariff barriers to imports of tropical timber harvested unsustainably. These measures would surely be open to challenge under GATT rules. How much better it would be for tropical timber producing countries to reform their own timber royalty structures to reduce incentives for profiteering in tropical timber exports. The developing country government would receive the revenues directly, the incentives for improved timber management would apply to all production, for domestic use and for export to all destinations, and the

measures would be completely consistent with GATT principles.

In Eastern Europe and Russia, underpricing of energy has fostered grossly inefficient domestic energy use, increased pollution, and deprived countries of badly needed potential export revenues. Eliminating such resource subsidies would constrain domestic consumption and release additional supplies for exports, and provide financial resources for investment in higher production and efficiency. Eliminating resource subsidies yields economic and environmental returns.

Harmonize Procedural Standards Governing Testing and Risk Assessment

While countries may understandably and legitimately adopt standards implying different levels of control over environmental risks, there are many economic and environmental gains to be obtained if the procedures for risk assessment are harmonized internationally. Such issues as “How should risks be assessed? What data are relevant, and how should they be collected? What tests and testing procedures are acceptable?” can be agreed upon internationally without impinging on each country’s authority to decide for itself the level of acceptable risk. Uncertainty regarding the actual quality of products entering the country from abroad would be reduced. The workload on environmental agencies would be reduced. Agreeing on these important procedural matters would reduce the regulatory costs of international investment and trade. It would also reduce the scope for trade disputes over the legitimacy and scientific basis for product standards.

In summary, fears over the impacts of environmental policies on trade have not been balanced by hopes for potential benefits. The two goals are potentially complementary. Good

environmental policies can help secure the gains from trade and avert trade conflicts. Trade liberalization can lead to better environmental quality, if conducted with adequate safeguards. What is needed is a consistent vision of sustainable development and a coherent set of domestic and international policies to promote both.

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