

Environment and Trade

A Handbook

Second Edition



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Physical and economic linkages

There is no simple pattern to the relationship between trade, environment and development. Depending on the sector, the country, the markets and prevailing policies, trade and trade liberalization may be good or bad for the environment and development. In fact, they will usually be both at once—good in some ways, bad in others.

This chapter illustrates the point by listing and explaining the complex physical and economic linkages that bind trade and sustainable development. For the most part, these consist of the impacts of trade on environment and development. The next chapter, on legal and policy linkages, widens the scope to also include the impacts of environmental concerns and environmental law on trade.

Trade flows and trade liberalization have at least four types of physical and economic impacts on environment and development: product effects, scale effects, structural effects and direct effects.¹ Each of these is examined in turn below.

4.1 Product effects

Product effects occur when the traded products themselves have an impact on the environment or development. On the positive side, trade may lead to spreading of new technologies for protecting the environment, such as microbial techniques for cleaning up oil spills. Or it may more rapidly spread goods or technologies that have less environmental impact—for example, solar power technology or more fuel-efficient automobiles—than those currently used. Openness to trade and investment can also help contribute to development objectives, by facilitating transfer of new and improved technologies and management systems.

On the negative side, trade can facilitate international movement of goods that, from an environmental perspective, would best never be traded. With hazardous wastes and toxic materials, the environmental risks increase the further the goods are transported, since spillage is always possible. As well, such “goods” may end up being dumped in countries without the technical or administrative capacity to properly dispose of them, or even assess whether they should be accepted. Trade also makes possible the over-exploitation of species to the point of extinction—there is rarely enough domestic demand to create such pressure.

1 This taxonomy is based on the work of the OECD. See *The Environmental Effects of Trade*, Paris: OECD, 1994.

A subset of product effects, sometimes termed “technology effects,” is associated with changes in the way products are made depending on the technology used. Technology effects stem from the way in which trade liberalization affects technology transfer and the production processes used to make traded goods. Positive technology effects result when the output of pollution per unit of economic product is reduced. Foreign producers may transfer cleaner technologies abroad when a trade measure or agreement results in a more open market and a business climate more conducive to investment. Trade-induced growth and competitive market pressures generated by liberalization can hasten processes of capital and technological modernization for all firms. Newly opened markets can provide the revenue and the income to allow firms to accelerate capital turnover, and invest in cleaner, more efficient plants, technologies and processes.

On the other hand, trade liberalization and an expanded marketplace may harm more environmentally-friendly and socially valuable traditional production methods. Trade liberalization can also promote the spread and use of harmful, less-environmentally-friendly technologies. Whether technology effects stemming from liberalization have an overall positive or negative effect on the environment will depend considerably on other conditions and policies in the marketplace that determine availability and choice of those technologies (for example, price and national environmental regulation). These effects are discussed under the heading “imported efficiency” in Box 4-1.

4.2 Scale effects

Trade and trade liberalization can expand the level of economic activity possible by making that activity more efficient. Box 4-1 explains the ways in which trade can increase efficiency, producing more goods with the same given set of natural resources, labour, machines and technology.

This expansion—essentially creating additional wealth—can have positive effects on the environment and development. It has obvious development benefits; although development is more than economic growth, such growth is essential for development in most Southern countries. We should note, however, three important qualifications to this positive link between trade and development:

- First, distribution matters. That is, if trade increases inequity by creating wealth that is mostly concentrated in the hands of the wealthy, then it works against important development objectives.
- Second, not everyone will benefit from trade liberalization; inherent in the wealth-creating process is destruction of inefficient firms and sectors.

- Third, the potential of trade to increase wealth is just that: potential. To enjoy trade's full potential countries may need to devote, for example, a large amount of resources to building capacity in their export sectors.

Where trade creates wealth, two types of environmental benefits may follow. First, increased efficiency can directly benefit the environment, since efficient firms need fewer natural resource inputs and pollute less. In this sense, the basis of comparative advantage—efficient use of resources—also underlies the goal of sustainable development.

Second, efficiency can benefit the environment indirectly by making people wealthier, and thus more likely to demand stronger environmental protection. This is not to say that the poor do not value the environment; indeed, their poverty may mean they depend on it more directly than do the rich. But it may be a lower priority than it would for those with stable employment and adequate income, food and housing. Much evidence suggests that richer economies will likely have lower levels of certain harmful emissions than poorer ones (this relationship does not hold for pollution and environmental degradation whose effects are felt far away in time or in space, such as greenhouse gas emissions). Where trade alleviates extreme poverty, it may save people from a vicious cycle whereby they are forced to degrade their environment to survive, in the process becoming increasingly impoverished.

An increased scale of economic activity can also have negative environmental effects. Most economic activity damages the environment in one way or another, whether in extracting raw materials, harvesting renewable resources, or in creating waste and pollution. Unless regulations are in place to ensure that the additional activities cause no harm—an unlikely scenario—increasing the scale of economic activity means increasing the levels of environmental damage. In fact, while the environment has benefited from steadily increasing economic efficiency over the years—a “decoupling” of growth from environmental impacts—those benefits have typically been overwhelmed by the impacts of increased production and consumption.

Another possible negative effect stems from the additional wealth created by trade—the same wealth that, as noted above, can benefit the environment and development. For some types of pollution, increased wealth may mean more, not less pollution. The richer countries of the world, for example, have far higher per capita emissions of all types of greenhouse gases than do developing countries, far higher per capita use of natural resources, and far higher per capita emissions of such toxins as PCBs, dioxins and furans. With enough wealth comes the opportunity to consume at levels and in ways that are worse for the environment.

Box 4-1. Improving efficiency: How trade can create wealth

Allocative efficiency. Liberalizing trade allows countries to specialize in producing those items at which they are relatively more efficient—at which they have a “comparative advantage.” This allows more goods and services to be produced by nations that engage in trade, and so increases GDP. The other side of this coin is that trade restrictions or distortions tend to decrease allocative efficiency. For example, if a Northern country put enough tariff protection or subsidies in place, and devoted enough greenhouses and energy, it could produce coffee for its own market. But this would be economically inefficient and environmentally damaging.

Efficiency from competition. Another way in which trade creates wealth is to expose domestic firms to foreign competition, and thereby force them to innovate to become more efficient. Sometimes, better provision of goods can directly serve development objectives, as in the case of telecommunications and other such infrastructure provision. Again, these efficiency benefits are missed where trade is restricted or distorted. Of course, even efficient domestic producers may suffer if exposed to competition from firms with international monopoly power.

Imported efficiency. A third way in which trade can create wealth is through openness to foreign investment, or imports of foreign technology, which can bring more efficient methods of process and production. These can be embodied in a piece of equipment, or in the management techniques brought by a foreign firm establishing itself in a host country. Some multinational firms adhere to a global standard, and bring the same level of technology and practice to all their locations worldwide. Others will diminish the imported efficiency effect by using outdated, less efficient technology in countries where health, safety and environmental protection is more lax.

4.3 Structural effects

Trade liberalization will lead to changes in the composition of a country's economy, causing it to produce more of the goods it makes well or has in abundance, to trade for those it does not. For example, a heavily forested country that did not trade would produce only enough forest products for its own people. Under a trading scenario it might produce enough for export as well, increasing the size of forestry's slice in the nation's economic pie. This

kind of structural effect can be either positive or negative for the environment and development.

On the positive side, if the composition of the economy changes so that less polluting sectors have a bigger share of the pie, then trade has resulted in environmental improvements (at least at the national level; the polluting firms may have simply moved to a different country). Similarly, trade liberalization would help foster development if the composition of the economy changed to include sectors or firms with stronger links to the domestic economy, increased employment prospects, or otherwise enhanced potential for creating income equity.

Trading with a country whose consumers demand green goods may also change the composition of the economy, if exporters respond by creating new products or sectors. A number of coffee producers in Mexico, for example, have collaborated on marketing organically grown coffee, which can be sold at premium prices. The potential environmental benefits are obvious. Usually, the impetus for a green shift in composition comes not from final buyers of goods, but from other firms buying inputs. For example, Ford and GM, two giants of U.S. automobile manufacturing, have declared that they will buy only from suppliers that are certified as following the ISO 14001 environmental management system. If ISO certification leads to environmental improvements, then Ford and GM will have forced such improvements down the supply chain to foreign and domestic suppliers.

Also on the positive side, trade liberalization may remove subsidies, quotas or other trade-restrictive measures that frustrate allocative efficiency. To use the fictitious example cited in Box 4-1, if trade liberalization forced a Northern country to stop protecting its own coffee industry, the resources that had been used for that industry could go to other more productive uses. This would have significant development benefits for the countries where coffee grows naturally, which could increase their exports. It would also have environmental benefits. For example, far less heat (or none) from fossil fuels would be needed to grow the same value of more traditional produce in the former coffee greenhouses.

On the negative side, if the goods that a country makes well are based on natural resources, or are pollution-intensive, then trade liberalization would increase the share of such industries in the national economy. Without appropriate environmental policies, this would mean increased pollution, or accelerated harvesting of natural resources such as fish or timber, perhaps at unsustainable levels. When liberalization creates opportunities for this type of trade, linking domestic natural resources to international demand, environmental degradation and resource depletion can be rapid, and the resulting scale of activity in the newly-expanded sectors can overwhelm existing domestic regulatory regimes.

Similarly, trade liberalization may change the mix of industries to attract those that do little to help advance development objectives. Agricultural liberalization, for example, can displace subsistence farmers for investors with the wherewithal to operate large-scale cash crop export businesses. While the size of the economy might increase under such a scenario, income distribution often suffers.

Another set of possible negative effects of economic openness is related to timing of liberalization, and the transitional process of economic restructuring. These result from openness not only to trade in goods and services, but also to flows of investment (for example, direct investment, portfolio investment and currency speculation). More and more research shows that timing is crucial in liberalizing regimes for trade and investment. Small developing economies in particular may be hamstrung by geographical, sectoral or institutional problems that cannot be quickly overcome. In the meantime, liberalization may produce a painful and protracted transition. In these economies, experience has shown that economic openness must be properly staged, and accompanied by policies specifically designed to ease the restructuring process. Otherwise, liberalization may, at least in the short and medium term, actually work against growth, employment, poverty alleviation, environmental protection and other components of sustainable development.

4.4 Direct effects

Direct effects are environmental impacts caused by the very fact of trade, rather than caused indirectly by the economic or legal changes it brings about. One such impact is the pollution associated with the transport of traded goods. Whether by truck, by ship or by air, traded goods must somehow move from their place of production to their point of final sale, and so increased trade in goods will inevitably mean increased transport pollution. Studies of the environmental impacts of the European Union's internal market predicted that the increased pollution—mostly from truck transport—would dwarf all other environmental impacts, as well as outweigh any environmental benefits to be derived from integration.

Another direct impact comes from invasive species of plants and animals that are unintentionally transported with traded goods. These can be imported on the goods themselves (e.g., pests arriving on produce), or in the process of delivering the goods (e.g., in the packaging material, or on board the transport vehicles). The Asian long-horned beetle, poised to devastate the hardwood forests of Northeastern United States, probably arrived in wooden packaging crates from Asia. The annual economic damage done by one invasive species alone—the zebra mussel, brought the North American great lakes in the ballast of ships—is over a billion dollars. Because they play havoc with host ecosystems, crowding out native species, invasives are a major or contributing factor in the demise of roughly half the endangered species in North America.

Suggested readings

Physical and economic linkages

Nordstrom, Hakan and Scott Vaughan, 1999. "Trade and Environment," (special studies #4). Geneva: WTO. <http://www.wto.org/english/res_e/booksp_e/special_study_4_e.pdf>

Copeland, Brian R. and M. Scott Taylor, 2003. *Trade and the Environment: Theory and Evidence*. Princeton: Princeton University Press.

Gallagher, Kevin P. and Jake Werksman, 2002. *Earthscan Reader on International Trade and Sustainable Development*. London: Earthscan Publications Ltd.