

Free Trade and the Environment: The Picture Becomes Clearer

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Preface

In recent years the debate about the costs, benefits and longer-term implications of free trade and economic globalization has moved to the forefront of public policy concerns. Among the key issues shaping the free trade and economic globalization debate is the question of how trade liberalization affects environmental quality, either in terms of direct effects on our environment, or indirectly—for instance, the effects that such trade laws as those codified in the North American Free Trade Agreement (NAFTA) and the World Trade Organization (WTO) have on hard-fought national environmental standards and regulations.

While work in assessing these environmental effects of free trade remains in its infancy, since the earliest assessments or reviews of trade accords considerable progress has been made in refining methods, approaches and processes: assessment methodologies have improved, environmental data—though still filled with gaps and afflicted by a certain lack of comparability among trading partners—are becoming more robust, and tools capable of drawing links between trade-related economic changes and environmental changes continue to be developed.

Among these and many other improvements, perhaps the most important will be establishing the means for ensuring that civil society is engaged early, and engaged meaningfully, in environmental assessments of the free trade agenda. Indeed, of all the grievances leveled by civil society against trade agreements, the lack of transparency and public participation remains perhaps the loudest. In addition, considerable controversy remains as to whether environmental diagnostics will lead, as in other policy arenas, to robust environmental policies and regulations.

Since its founding in 1994, the Commission for Environmental Cooperation (CEC) of North America has been engaged in assessing the environmental impacts of free trade. Valuable lessons are still being learned about approaches, methods, data and public procedures.

This booklet summarizes some key observations of work thus far by the CEC Secretariat and the public. It highlights, in particular, findings presented in late 2000 at the first North American Symposium on Understanding the Linkages between Trade and Environment in Washington, DC, as well as places this important work in the broader context of valuable studies undertaken elsewhere. We are grateful to the Ford Foundation for the generous support that allowed this volume to be produced.

Authors of the symposium papers, representing nongovernmental groups, academic researchers, representatives of intergovernmental organizations and the private sector, discussed a wide range of environmental media and economic sectors in Canada, Mexico and the United States in their contributions, ranging from the effects of NAFTA on forestry, fisheries and freshwater to trade in hazardous waste, transportation and services. [The papers delivered at the symposium, as well as summaries of the discussions that followed them, are published in *The Environmental Effects of Free Trade: Papers Presented at the North American Symposium on Assessing the Linkages between Trade and Environment (October 2000)*, CEC 2002.]

This report is of course not by any means the last word on whether free trade has been “good” or “bad” for North America’s environment. Yet the wealth of analysis contained herein should help point the way to the work that needs to be done—both in assessing trade effects and also in crafting policy responses to ensure that emerging environmental and economic agendas work in a cooperative and sustainable way.

Victor Shantora

Acting Executive Director

Secretariat of the Commission for Environmental Cooperation of North America

An Introduction: Free Trade *with* Environment, or Free Trade *versus* Environment?

As the crumbling Berlin Wall has become a symbol of the triumphs of democracy and free markets, the building of a temporary wall in Quebec City to keep public demonstrators apart from trade and economic officials meeting during the Summit of the Americas in April 2001 might be taken as a symbol of a new kind of divide between critics of free trade and globalization and the architects of free markets.

Although the list of grievances against free trade is lengthy and diverse, a common rallying point is that the means by which trade policy has traditionally been formulated is opaque, non-participatory and somehow undemocratic. Among the signs and banners that accompany many anti-globalization demonstrations, one of the most common is: “This is what democracy looks like!” The apparent wedge between market liberalism and some elements of civil society challenges the view that economic prosperity, environmental protection, and democracy are inseparable. Indeed, economic theory generally holds that all three are complementary, in that economic growth nurtures related democratic institutions and initiatives such as improved education, increased spending on health care, and higher levels of environmental protection, all bolstered by an enlarged middle class.¹ Similarly, empirical work shows a robust relationship between economic growth, rising standards of living, and democracy.²

Within the context of a long-standing debate about the relationship between economic growth and general welfare gains, a relatively new and particularly contentious area revolves around the question of the net impacts of free trade on the environment. Over the past decade, the trade-environment debate has involved claims that increased trade undermines environmental quality through scale effects, and counter-claims that free trade enables countries to grow out of their environmental problems. It is the latter view that has been embraced by trade advocates, bolstered by economic theory and some empirical findings. These advocates have argued that economic prosperity—fuelled in part by free trade—enables a country to generate revenues necessary to put in place stringent environmental regulations. Moreover, higher per capita income creates a powerful stimulus for higher demand among the public for improved levels of environmental quality.³

Income Growth and Environmental Change

This view has prompted a rich debate in the literature about the relationship between free trade, growth in income, and some indicators of environmental quality. In many ways, it remains a fertile testing ground for determining trade-environmental outcomes. In a hypothesis known as the Environmental Kuznets Curve, presented during the NAFTA negotiations in three influential and hotly-debated papers, Krueger found that some pollution emissions—notably, sulfur dioxide, nitrogen oxides and suspended particulate matter—initially rise as per capita income within a country rises. But then the trajectories of income growth and pollution emissions appear to go in

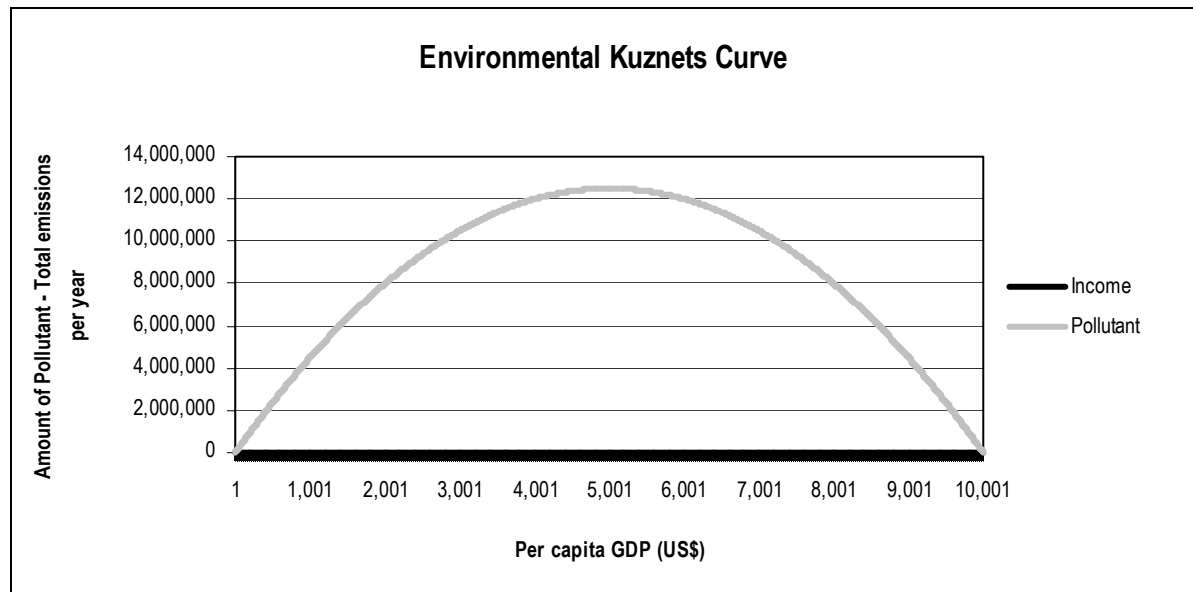
¹ Seymour Martin Lipsett (1959). “Some Social Requisites of Democracy: Economic Development and Political Legitimacy.” *American Political Science Review*. 53.

² Robert J. Barro (1999). *Determinants of Economic Growth: A Cross-Country Empirical Study*. MIT Press: Cambridge, Mass. Also, Seymour Martin Lipsett. 1959. “Economic growth and income inequality.” In Seligson and Passe-Smith, *Development and Underdevelopment*, pp 43–55. For a disquieting analysis of policy reform and standard of living improvements offset by stagnant economic growth in developing countries, see William Easterly (2001). “The Lost Decades: Developing Countries’ Stagnation in Spite of Policy Reform 1980–1998.” *Journal of Economic Growth* 6(2): 135–157.

³ More recently, Bjorn Lomborg has argued that “environmental development often stems from economic development—only when we get sufficiently rich can we afford the relative luxury of caring about the environment.” See Bjorn Lomborg (2001). *The Skeptical Environmentalist*, Cambridge: Cambridge University Press.

opposite directions: as income grows, pollution emissions move to the opposite, or downward, direction (see graph).⁴

The turning point at which economic growth and pollution emissions separate depends on the particular emissions and air conditions tracked. For NO_x, SO_x and biological oxygen demand (BOD), the turning point appears to be around US\$5,000 GDP per capita. This observation supports the views, noted above, that countries can grow out of pollution problems with wealth.



However, the debate that followed, backed by empirical data, found that this mutually supportive relationship between free trade/economic growth and environmental quality is true only part of the time. It depends on the kind of environmental indicators that are examined. For example, indicators such as greenhouse gases (GHG), the loss of biodiversity, and the loss of primary forests and habitats did not display the kind of turning point that was found for NO_x or SO_x emissions. Instead, there appears to be a continuous increase in GHG emissions or habitat degradation as GDP per capita continues to increase. Other studies have noted that at higher levels, certain indicators, such as SO₂, undergo an absolute increase, shifting from an inverted “U” shaped curve, to an “N” shape curve.⁵

What is clear is that some evidence supports the economic growth/environmental improvement view of the world, and other evidence clearly refutes it. In some instances, free trade has brought about improvements in environmental quality, especially when driven by the open exchange of new, more efficient capital technologies, the exchange of environmental management practices, and other factors. At the same time, free trade has been linked with environmental degradation: the cases

⁴ G.M. Grossman and A.B. Krueger (1991). “Environmental Impacts of a North American Free Trade Agreement.” *National Bureau of Economic Research Working Paper* No. 3914, November; also Grossman and Krueger (1993) “Environmental Impacts of a North American Free Trade Agreement,” in P. Garder (ed), *The U.S.-Mexico Free Trade Agreement*. MIT Press: Cambridge, Mass.; and Grossman and Krueger (1995). “Economic Growth and the Environment.” *Quarterly Journal of Economics*. Vol. 110(2).

⁵ R.K. Kaufmann, B. Davidsdottir, S. Garnham and P. Pauly (1997). “The Determinants of Atmospheric SO₂ Concentrations: Reconsidering the Environmental Kuznets Curve” *Ecological Economics*. (Special Issue). See also H. Hettige, M. Mani and D. Wheeler (1998). “Industrial Pollution in Economic Development (Kuznets Revisited)” *Policy Research Working Paper* No. 1876. The World Bank, Washington, DC; and E. Barbier (1997). “Introduction to the Environmental Kuznets Curve” *Environment and Development*. (Special Issue).

noted below list some of those instances. However, what remains unclear is the question of *linear causality*: has free trade been the cause either of environmental improvements or degradation? And does it much matter?

Studies prepared on behalf of the Commission for Environmental Cooperation (CEC) have focused on environmental effects that can be linked back to the implementation of the North American Free Trade Agreement (NAFTA).⁶ The lessons of those studies show clearly that free trade can be directly linked to some changes in environmental quality. For example, NAFTA has been shown to lead to marginal increases in aggregate carbon monoxide air pollution—amounting to approximately two percent—as measured for the United States as a whole. In other instances, free trade in electricity has been linked to marginal improvements in environmental quality, notably because of accelerated capital turnover.⁷

However, a principal finding from the Commission's assessment work is that environmental impacts become more significant when disaggregated and measured by economic sector, environmental medium or geographic location. Moreover, while most environmental assessments of trade suggest an indirect and largely weak link between trade and changes in environmental outcomes, evidence shows a robust and direct trade-environment link in the transportation sector relating to (a) increased air pollution in border areas, from freight transportation, and (b) the increased entry of alien invasive species, from the expansion of transportation pathways, particularly from marine transportation.

Studies highlighted below, and presented in their entirety in *The Environmental Effects of Free Trade: Papers presented at the North American Symposium on Understanding the Linkages between Trade and Environment* (CEC 2002), suggest a number of other ways in which trade liberalization can affect the environment. Perhaps the most important, and contentious, remains the policy-to-policy interplay between trade policy reforms included in NAFTA and the Uruguay Round of the WTO, and environmental regulations. A key concern of environmental groups remains the case history of NAFTA Chapter Eleven investment provisions, which empower investors to challenge domestic environmental regulations for actions “tantamount to expropriation.” In addition, there is some evidence that differences in environmental regulations between the NAFTA trading partners is contributing to specific instances of pollution havens. The most dramatic is the more than 400 percent increase in imports of hazardous wastes from the United States to Canada since NAFTA was implemented in 1994.⁸ The main reason for the jump in imports appears to be the significant difference in the cost of regulatory compliance between the two countries.

The hazardous waste example underlines a key lesson of environmental assessments of trade: environmental regulations, and environmental institutions, matter. The question is not whether free trade in and of itself leads to better or worse levels of environmental quality. The record shows mixed results, depending on the sector or environmental medium examined. However, the effectiveness of environmental regulations is of pivotal importance, especially during transitional periods when countries open markets to international competition, streamline regulations and standards to reduce administrative costs, and move to restructure markets through the deregulation of competition policies. An important policy lesson is also a simple one: as countries move to the convergence of trade, investment and competition policies in support of the globalization agenda, a similar effort is needed to ensure that robust environmental regulations and policies are enacted to anticipate and mitigate environmental impacts stemming from free trade.

⁶ CEC (2002). *The Environmental Effects of Free Trade: Papers presented at the North American Symposium on Understanding the Linkages between Trade and Environment*. Montreal: CEC.

⁷ Tagis Plagiannakos. “Will Free Trade in Electricity between Ontario/Canada and the United States Improve Air Quality?” in CEC 2002.

⁸ Marisa Jacott, Cyrus Reed and Mark Winfield (2002). “The Generation and Management of Hazardous Wastes and Transboundary Hazardous Waste Shipments Between Mexico, Canada and the United States,” in CEC 2002.

It should come as little surprise that a recurring concern of civil society in the trade-environment debate remains the capacity of domestic regulations to meet the challenges of globalization. Although the objective of maintaining environmental regulations seems simple enough, the reality is that governments working in international markets appear constrained to adopt environmental policies that may affect GDP.

Evidence that environmental regulations come under pressure during the process of liberalization is mixed. There are numerous examples in which environmental regulations within North America have either held their own or have been strengthened during the period in which NAFTA itself has been implemented. At the same time, there is an underlying concern—often expressed in the context of the effects of globalization on domestic governance—that governments may feel constrained to implement equity and other kinds of public policies, including environmental policies, during periods of liberalization and exposure to international competition. The reason is the reluctance of some governments to implement social policies that could undercut national competitiveness in global markets. (Increased capital mobility makes it more difficult for governments to tax capital, and in response, many countries have shifted tax policies to labor.⁹) Liberalization outside of trade policy may provide useful guidance for governments searching for the means to introduce cushions and safety nets that absorb trade-related environmental pressures. The lesson of liberalization of financial markets is more turbulent than trade liberalization impacts. However, there may be some similarity in one sense: liberalization of capital accounts appears, in hindsight, to have taken place too quickly, and with an untested confidence in a “one-size-fits-all” approach that misjudged the complex and important differences between countries. Moreover, the hard-won lesson of the International Monetary Fund—long seen as a key catalyst of globalization—is that wholesale liberalization has overwhelmed domestic regulators. The IMF has concluded from the financial turbulence of the 1990s that liberalization needs to proceed in a more gradual or sequenced manner, so as to allow domestic regulations ample time to adjust to the shocks of full, international competition.¹⁰

Although the evidence of the environmental effects of trade liberalization remains less robust than the glaring example of the financial instability of the past decade, a similar policy recommendation should at least be considered in the trade arena. In addition to focusing on what environmental policy ought to do, by way of flanking measures and safety nets to mitigate environmental shocks, attention ought to be focused on adjusting the sequence of trade liberalization itself, to allow environmental regulators time to adjust to market integration.

The financial crises of Mexico, Russia, the countries of the Asian Pacific rim and, most recently, Argentina have instilled an urgency in improving the sequence of liberalization, and strengthening the architecture of the international financial market oversight.¹¹ By contrast, there has been no comparable effort to examine whether liberalization of trade policy is overwhelming domestic environmental regulators, and whether different liberalization sequencing options ought to be implemented to reduce environmental impacts, and improve policy integration.

⁹ The most visible way to address equity issues is through income redistribution schemes. That is, since the capacity of governments to undertake income redistribution policies in the face of globalization is seen to be small, it is assumed that addressing equity goals through revenue redistribution is seen as more effective than through adjusted tax rates.

¹⁰ Discussing the effects of capital account liberalization, the Fund notes benefits—notably increased investment, technological spillovers and generally higher rates of economic growth—need to “set against the danger that open international financial markets can also create financial problems, including financial crises, with large output costs....Successful international capital account liberalization often requires careful sequencing of policies, requiring a detailed assessment of country-specific circumstances.” International Monetary Fund (2001). “Chapter IV: International Financial Integration and Developing Countries,” *World Economic Outlook: October 2001*. Washington, DC: IMF.

¹¹ It has been noted that the “dynamics of market behavior ought to be a source of increasing concern to policymakers and market participants. At present it is not clear who is responsible for the regulatory oversight of markets.” William White (2000). “What Have We Learned from Recent Financial Crises and Policy Responses?” *Bank for International Settlements Working Paper* No. 84. January 2000.

Instead, the trade-environment debate is limited for the most part to the environmental community's trying to guess at the economic effects of trade liberalization commitments—usually before those commitments are firmed up—and then making further guesses about the anticipated environmental impacts, hopefully coming within an order of magnitude of the end results. In short, the dynamic remains “what will free trade do to the environment?” This dynamic reiterates the concerns of civil society that have been on the books for nearly a decade.

Recalling Environment-trade Predictions

A decade ago, the debate about how much free trade would affect the environment revolved around four main hypotheses:

- 1. Scale Effects:** As free trade expands total economic activity, greater pressure is placed on the environment, both through increased inputs from natural resources such as energy, timber or freshwater sources needed to drive an expansion in production, and through greater volumes of air and water pollution emissions—more hazardous wastes or more toxic releases arising from increased production. It is clear that the scale effects of trade are being offset, or decoupled from, total increases in different kinds of pollution. One indicator of this de-linking is the decrease in energy intensity per unit of gross domestic product (GDP) in most industrialized countries. These scale effects are offset partially by advances in technologies, as well as by compositional effects. Moreover, as trade liberalization prompts the re-allocation of productive resources through specialization, as well as scale economies, the concentration of economic activities places even more pressure on the environment.
- 2. Competition Effects:** As free trade increases the contestability of markets exposed to international competition, pressure increases at the company level to minimize environmental expenditures in the same way that companies avoid other kinds of sunk costs. This competitiveness concern is transmitted by the private sector to governments, who move to relax the monitoring and enforcement of environmental regulations to keep companies at home. This argument bears a striking resemblance to the “jobs-versus-environment” debates of the 1970s, with the playing field expanded by trade liberalization. The shorthand labels for these assertions are “race to the bottom” and “regulatory chill” effects.
- 3. Locational Effects:** If domestic governments maintain strict environmental regulations in the face of increased market competition, companies—responding to capital mobility opportunities—will exit countries with high environmental regulations (or enforcement), and move to countries either with no regulations, or with more lax enforcement of those regulations. The shorthand for this effect is the “pollution haven hypothesis.”
- 4. Regulatory Effects:** Finally, even if governments are not swayed by competitiveness concerns and maintain or enhance domestic environmental regulations, those regulations may run afoul of trade laws. Prior to the adoption of NAFTA and the WTO, many argued that hard-fought regulations covering environmental, human health, food safety and wildlife protection would clash with trade rules, with the latter trumping the former. Areas of special concern included the effects of NAFTA on Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary Measures (SPS) on domestic environmental provisions. Following the implementation of NAFTA, court challenges have instead involved Chapter Eleven investment rules (discussed below).

Trade, Growth and the Environment

In looking at the above list of environmental impacts arising from free trade, probably no group was caught off guard more than free-traders themselves. This was partly because, a decade ago, the links between trade and environmental issues were weak at best, but mainly because the economic—let alone the environmental—effects of the old trade agenda were marginal and incremental, rather than pronounced and sudden, as the environmental community argued.

While proponents of free trade have long argued that it is an important engine to economic growth, in fact, there is little direct, causal relationship between free trade and economic growth. Indeed, the empirical literature suggests a surprisingly weak direct linear relationship between the two. Instead, an extensive body of literature *infers* a link, although the channels linking them are indirect, dynamic and generally complex. One way in which the correlation between free trade and economic growth is inferred is by comparing countries that adopt more “open” economic policies with those that maintain “closed” policies: countries with open policies tend to grow faster than countries that maintain closed economic policies.¹²

At the same time, a trade–economic growth linear relationship is mixed or weak, not statistically robust. This contrasts with other areas in which strong causal links have been made to explain economic growth: in particular, foreign direct investment (FDI) or other types of investment, technological innovation, levels of research and development, education, and accumulation of human capital and skills. The size of governments and their institutional functions have long been identified in the economic literature as factors in economic growth.

By contrast, the economic effects of free trade remain largely indirect, and are generally transmitted through changes in relative prices. The more familiar agenda of trade liberalization—which involved the reduction or elimination of tariffs, subsidies, other kinds of price interventions, non-tariff measures or other policies applied at the border—generally results in the reorganization of some capital, labor and production into areas that yield higher rates of return at international prices. By reducing the price wedge between domestic and international prices—wedges that are kept in place by tariffs, subsidies and various non-tariff barriers—some producers or whole sectors may expand as they respond to new export opportunities. Others contract as they buckle in the face of international competition. On balance, trade liberalization delivers more economic winners. However, while the benefits of trade liberalization are often thinly spread across an economy, potential losers are often highly visible.

A methodological problem for those assessing the environmental effects of trade remains in the delineating of effects from different trade packages which are being implemented, or negotiated, simultaneously. It is difficult—although conceptually feasible—to distinguish the effects of certain kinds of tariff reductions under NAFTA from the effects of those developed in the Uruguay Round of the WTO or proposed in the Free Trade Area of the Americas (FTAA) draft agreement. Indeed, a common criticism of environmental reviews is that efforts to isolate the effects of one accord from another are analytically strained.

This certainly is true when thinking about the deepening of the old trade agenda. However, if the trade liberalization agenda were simply about lowering tariffs and reducing non-tariff barriers—albeit at different rates—then sorting out the effects of differential pricing effects would seem a curious use of scarce resources. However, there are important differences between trade agreements. Crucially, these differences have less to do with the extent to which tariffs are lowered and more to do with differences in the level of commitments surrounding the “new trade agenda.” That new

¹² No single, unambiguous definition of “openness to trade” exists. Definitions include measuring the overall ratio of exports to GDP, the ratio of imports to GDP (which may say more about the extent of trade-distorting measures), or the combined trade density to GDP. However, the trade-to-GDP ratio may say little about trade policies *per se*, and more about other factors, such as the size of the internal market (as in the case of the United States).

agenda comprises a range of commitments for measures applied well inside the border, which include measures pertaining to investment, intellectual property rights, patent protection, procurement policies, the inclusion of services, and the introduction of competition policy—including anti-trust regulations—into the trade agenda.

The single most important way in which NAFTA differs from all other trade accords—notably the General Agreement on Tariffs and Trade and its successor, the WTO—is the inclusion of rules covering investment. Indeed, it has been argued that the Chapter Eleven investment provisions represent the “centerpiece” of NAFTA, creating new disciplines as well as administrative procedures that include binding dispute settlement provisions between private parties and government entities.¹³

Recent developments suggest that over time, differences between trade agreements will narrow. For example, the Doha Ministerial Declaration of the WTO includes references to investment policies, thereby narrowing significantly any difference between NAFTA and the WTO. However, since NAFTA remains the only multilateral trade agreement that contains disciplines covering investment, isolating its effects in this area has proven to be alarmingly easy for the environmental community¹⁴ (see below).

Before looking at the different environmental effects, it will be useful to summarize changes in total trade flows, at the aggregate level, in North America since NAFTA and the WTO began their implementation in 1994 and 1995.

Growth in Trade

During the past two decades, world trade has increased significantly. Total world trade over the past 20 years has increased at twice the rate of real gross domestic product (GDP) growth (six percent per annum, compared to three percent). During the 1990s, trade in goods among Canada, Mexico and the United States nearly doubled, rising from approximately US\$350 billion in 1994 to more than US\$700 billion in 2000.

In 2000, the three economies of North America produced over US\$11 trillion worth of goods and services. The combined US-Canada trade represents the largest bilateral trading relationship in the world, and Mexico-US trade has expanded significantly since NAFTA. Today, Mexico represents the second largest trading partner of the US. Since 1994, Mexico had experienced a four-fold increase in exports and imports, rising from US\$40 billion to over US\$170 billion. Most of total Mexican trade—approximately 80 percent—is with the United States. By contrast, Mexico’s trade with Europe during the same period decreased by more than one-half, from roughly 12 percent prior to NAFTA to less than five percent today.

Since the economic effects of trade liberalization in large part reflect the conditions and policies of a country prior to when liberalization occurs, not surprisingly the largest impacts of NAFTA continue to occur in Mexico. Total trade between Mexico and the US has increased by approximately 90 percent between 1996 and 2000. Manufacturing exports, as officially reported, have improved rapidly since NAFTA took effect. From 1995 to 1999, these exports grew at an annual rate of 16 percent, concentrated primarily in “value added” exports from maquiladora production. The total value of these exports increased almost 20 percent per annum, as the average value added of products exported from Mexico decreased (relative to their overall value).

¹³ Sylvia Ostry (2000). “Regional versus Multilateral Trade Strategies,” in *Isuma: Canadian Journal of Policy Research*. Vol. 1, No.1, Spring.

¹⁴ However, there are over 30 bilateral agreements involving the United States that contain investment rules. Moreover, the FTAA agreement currently under negotiation contains Chapter Eleven-like proposed disciplines.

Maquiladora exports contain a substantial percentage of imported components from the US and elsewhere. Total manufacturing imports from the US and the rest of the world grew 18.5 percent per year between 1995 and 1999, a fact that explains Mexico's rapidly growing overall foreign trade deficit in this period. In the long run, this process of economic growth with expanding foreign trade deficits could lead to another major currency crisis similar to the one that occurred in 1994.¹⁵

Canada-US trade in goods grew by roughly 40 percent during the same period. There is consensus that the Canada-US Free Trade Agreement, which entered into force six years prior to NAFTA, brought about such changes.

One way in which trade-related economic interdependence among the NAFTA partners is evident is the fact that 96 percent of total Mexican exports are destined for the United States. Since NAFTA, Canada's exports to the US have increased from 74 to approximately 85 percent. Today, roughly 40 percent of Canadian GDP depends on exports.

Trade interdependence is also a powerful engine in re-shaping domestic economies. For instance, trade is increasingly characterized by vertical specialization, in which different countries specialize in particular stages of the value-added chain of goods production as opposed to making the completed good. One catalyst in restructuring and interdependence is the increase in foreign direct investment (FDI) that has occurred in tandem with NAFTA.

Foreign Direct Investment

Over the past decade, FDI has increased dramatically, and more quickly than either international trade or average rates of domestic GDP. In 2000, FDI flows worldwide totaled US\$1.3 trillion. North America continues to represent one of the most important locations of FDI, together with Europe and Japan. For example, in the United States, FDI inflows grew by roughly 600 percent from 1984 to 2000. In Canada, FDI inflows grew approximately 10-fold over that period, while in Mexico, FDI inflows more than doubled.¹⁶

FDI Inflows, by host economy, 1998–2000

FDI Inflows	1984–94	1995	1996	1997	1998	1999	2000
Canada	5,692	9,257	9,635	11,525	22,575	25,150	63,735
Mexico	6,571	9,526	9,902	13,841	11,612	11,915	13,162
United States	42,535	58,772	84,455	103,398	174,434	294,976	281,115

Source: UNCTAD (2001), *World Investment Report*.

The single most important source of FDI throughout the 1990s was from mergers and acquisitions. Not only did the total number of mergers and acquisitions increase in the last decade (transatlantic mergers and acquisitions increased 47 percent in 1999 alone, from the previous year), their average size also increased five-fold: the average size of so-called “mega-deals” involving mergers and acquisitions rose from US\$29 million per deal in 1990 to US\$157 million per deal in 1999.

A long-standing economic debate has involved explaining why FDI locates where it does. There is not a single explanation illuminating the location of FDI. Instead, it is explained by a variety of

¹⁵ Carlos Salas (2001). “The impact of NAFTA on wages and income.” Report presented at the symposium: “NAFTA at Seven,” at the Economic Policy Institute, April, Washington, DC.

¹⁶ United Nations Conference on Trade and Development (UNCTAD) (2001). *World Investment Report: Promoting Linkages*. United Nations. New York.

factors, including the degree of economic policy liberalization (including capital account and other kinds of liberalization), the transparency and predictability of regulations, labor costs, technological factors, legal processes and private property, infrastructure, and the strategies of corporations engaged in FDI.

Geographic Concentration and Clusters

International trade is increasingly linked to the vertical specialization among trading partners: countries continue to become more specialized in distinct stages of the value-added chain of goods manufacturing, as opposed to producing a good in its entirety.¹⁷ This vertical specialization is familiar in several export-intensive sectors in North America, including in the composition of maquiladora exports from Mexico (noted above), as well as the automotive, aerospace or forestry sectors more generally.¹⁸ However, since NAFTA, North America's agricultural sector continues to undergo changes linked with vertical specialization.

In looking for factors that explain their location, attention has recently focused on the geographic agglomeration or "clustering" of firms. During the past decade, interest within such fields as economic geography, urban economics and spatial microeconomics has been directed in how firms cluster around specific areas. Various reasons have been forwarded to explain why firms locate where they do. The data suggests that as trade and investment liberalization proceeds, multinational corporations have greater freedom about where they can locate. In response, transnational corporations appear to be specializing their operations through different corporate functions.

Preliminary evidence suggests that, on average, the extent to which industries cluster in specific geographic locations reflects their level of technological advancement. Industries with higher levels of technological innovation—for example, the biotechnology and semi-conductor industries—show a high degree of clustering, while lower-tech sectors like textiles and clothing tend to have a lower degree of geographic concentration.

¹⁷ M. Ayhan Kose and Yi Kei-Mu (2001). "International Trade and Business Cycles: Is Vertical Specialization the Missing Link?" *American Economic Review*, vol. 91 (May), pp. 371–375.

¹⁸ The automotive sector provides an example running both ways, since the vertical specialization of automotive production between US car companies and their Canadian subsidiaries was a function of a political rather than economic arrangement, with the Auto Pact. This accord was struck down by a WTO dispute settlement decision brought forward by non-North American car manufacturers.

Is Free Trade Changing Our Environment? Some Lessons Learned

Policy Integration

The integration of environmental and trade policies remains weak, although there are isolated cases in which policies in the two areas have worked in tandem. These include the environmental benefits of removing subsidies and trade-distorting measures in specific sectors, notably the fisheries sector. However, instances of “win-win” trade-environment policy linkages almost invariably involve the calculation, *post facto*, of environmental benefits arising from established trade policy reforms.

For the most part, there are very weak linkages between trade and environment policies. For example, although the North American Agreement on Environmental Cooperation (NAAEC) obliges the Council of the CEC to cooperate with the Free Trade Commission of NAFTA, to date there have only been two *pro forma* meetings that have taken place between any NAFTA working group or committee and the CEC. Such lack of substantive cooperation between the CEC and the Free Trade Commission of the NAFTA has raised concerns among civil society that the obligations contained in NAAEC Article 10(6)—stipulating that the Council “shall cooperate” with the Free Trade Commission on a number of trade-environment linkages—has effectively been ignored by the Parties.¹⁹ Moreover, there remain many untapped areas in which policy cooperation could usefully take place: for example, by providing technical expertise as well as openness to the more than ten NAFTA committees and working groups that are addressing a number of environment-related issues—from the harmonization of automotive emission standards to the development of a common labeling practice for pesticides in North America.

The logic of integration remains fairly straightforward: as long as environmental considerations remain outside of, or external to, economic priorities—serving as little more than a policy appendage or after-thought to core economic decisions—then the world will find itself increasingly lurching from one ecological problem to next. The effort to include, or internalize, environmental costs that are external to final market prices has been identified as an important fiscal policy principle for some time.

In practice, little headway has been made in moving the environment up the policy priority list. True, some tentative progress in economic-environmental policy links have been made, particularly in the early 1990s, in the development of market-based measures or the inclusion of environmental goals in fiscal policy instruments. However, the integration of environmental factors into the mainstream remains distant, by any measure, and in any sector, from energy and automobiles to agriculture and fisheries. Hence, the lack of tangible progress on trade-environment integration appears no worse than in other areas of economic-environmental policy integration.

Transparency, Public Participation and Governance

It remains open to debate whether the street demonstrations that took place in Seattle in late 1999 were directed specifically against the WTO, or whether the WTO has come to symbolize just about every grievance that has ever been lodged against the global economy. However, Seattle has entered the vernacular as a kind of turning point in the public debate about free trade. In subsequent meetings held in Prague and Washington, Zurich, Quebec City—with the Third Summit of the Americas towards establishing the Free Trade Area of the Americas—and Genoa, groups representing environmental interests, labor, human rights, women’s development, food safety and

¹⁹ See, for example, JPAC Advice to Council 02-09: “Based on exchanges with the public and on further discussions by JPAC during its regular session, the following are recommended as concrete steps Council might take in fulfilling its clear obligations under NAAEC Article 10(6) to “cooperate with the NAFTA Free Trade Commission to achieve the environmental goals and objectives of NAFTA.”

anti-genetic modification, anti-poverty, and others gathered and leveled their most forceful protests against free trade and the institutions established to promote it.

Public grievances against globalization are too diverse to list. However, there is a broad sense that the actions of governments and the goals of democracy or the fruits of the democratic process rarely coincide. Civil society, in the very visible backlash against globalization, has been described as engaged in a fight to “regain control of the global economy.”²⁰

The single most important lesson of the CEC’s work on environmental assessment is a simple one: the public needs to be engaged early, and engaged often, in environmental assessments of trade. Transparency and meaningful public input into assessments or environmental reviews form the foundation of democratic governance. A recurring theme of the public’s grievance against the free trade and globalization agendas revolves to a great extent around transparency issues: public policies shaped by technocrats behind closed doors continue to invite misgivings that such policies favor certain economic interests over the general good.

One barometer of the public’s confidence in economic policies is the extent to which the policies take shape in a transparent and democratic way. This has become even more relevant as the dimensions of trade policy continue to expand well beyond constraining measures applied at the border—for instance, tariffs and non-tariff measures—to the “new” trade agenda that includes subsidies, human health and safety measures, investment, services, intellectual property rights and competition policy. As the new trade agenda touches upon almost every aspect of economic activity, it is all the more important that trade policies take shape in a transparent way.

Involving the public in environmental reviews or assessments of trade is vital to ensuring such exercises are legitimate, and more importantly, are deserving of the public’s trust. Indeed, most environmental policy has evolved through the commitment of the public, of communities and advocacy groups working to ensure high levels of environmental protection. By contrast, the work of trade policy has, for the first half-century of its existence, proceeded largely behind closed doors, with negotiators and technocrats working out compromises and packages (called “rounds” in the multilateral context).

Ensuring public input does not happen automatically. The approach of the CEC, an intergovernmental organization with a strong commitment to transparency through various innovative mechanisms,²¹ has been to seek public input through all stages of its work. In late 1999, following the completion of the CEC’s Analytic Framework²²—a checklist of what steps ought to be considered in undertaking environmental reviews or assessments of trade liberalization—the Council of the CEC issued a public Call for Papers, inviting proposals intended to put the principles of the Analytic Framework into action.

²⁰ Maude Barlow, Presentation at McGill University (Montreal), 9 March 2001. This Canadian commentator captures much of the tone about the undemocratic nature of trade accords: “Combining the powers of NAFTA and the WTO into one agreement [FTAA] will give unequalled new rights to the transnational corporations of the hemisphere to compete for and even challenge every publicly funded service of its governments, including health care, education, social security, culture and environmental protection... Most important, the world of international trade can no longer be the exclusive domain of sheltered elites, trade bureaucrats and corporate power brokers. When they understand what is at stake in this hemispheric negotiation, the peoples of the Americas will mobilize to defeat it. That is the fate it deserves.” See Maude Barlow (2001). “Up for Grabs,” *Canadian Perspectives*, Winter.

²¹ Examples of the CEC’s approach to public participation include the Articles 14 and 15 process, which establishes a citizen’s submission process to address allegations of failure to enforce domestic environmental laws by the three federal jurisdictions of NAFTA; the creation of a public Joint Public Advisory Committee with the mandate of providing direct advice to the Council of the Commission on any matter related to the CEC’s work; the creation of national advisory committees, and the creation of a public advisory committee in the formation of the CEC’s work on assessment methodologies.

²² Commission for Environmental Cooperation (CEC) (1999). *Assessing Environmental Effects of the North American Free Trade Agreement (NAFTA): An Analytic Framework (Phase II) and Issue Studies*. CEC: Montreal.

An advisory group to the Commission, comprising experts and environmental groups from Canada, Mexico and the United States, selected 13 research papers from almost 60 submissions received from the public. The research papers presented at an October 2000 symposium represent the work of nongovernmental organizations (NGOs), research experts and organizations from North America. The authors were assured complete independence and, where needed, were also provided a modest grant to support their research work. In addition to preparing original research work on a wide range of topics, the process increased research capacities within some NGOs, as well as supported better networks of cooperation among North American NGOs and researchers involved in different areas of trade-environment issues.

During the two-day North American Symposium on Understanding the Linkages between Trade and Environment, held by the CEC at the World Bank in October 2000, approximately 300 people participated in discussions. A live audio web-cast was also provided to enable those unable to attend the Washington meeting to follow the proceedings. The final papers and proceedings were published in English, French and Spanish by the CEC in early 2002.²³

Changes in Air Pollution Emissions Linked to NAFTA

Evidence arising from modeling work suggests that NAFTA has led to marginal increases in a number of pollutants. The relationship between trade liberalization and changes in pollution emissions is indirect and complex, and involves estimating the extent to which trade changes the allocation of resources within and between sectors subject to liberalization. Evidence from a general computable equilibrium model (GCE) suggests that the largest sources of increased air pollution, volatile organic compounds (VOCs), industrial toxins and bioaccumulative chemicals, and water pollution originate from three sectors: the petroleum sector, the base-metals sector, and the transportation and transportation equipment sector.

Changes in pollutants vary between sectors as well as between countries. For example, total emissions of carbon monoxide are estimated to increase by two percent in the United States, largely from an expansion in output in the base-metals sector linked to NAFTA. In Mexico, the largest increases in CO, NO_x and SO₂ emissions related to NAFTA arise from the expansion of the petroleum sector. Evidence suggests that increased transportation in Canada and the United States linked with NAFTA has been responsible for increased VOCs, as well as increased toxic releases and bio-accumulative metals. In Mexico, the expansion of the chemicals sector is linked to increased toxic releases. By contrast, NAFTA-related contraction in Canada's base-metals sectors coincides with a reduction in toxic releases from that sector.²⁴

New Pathways for Alien Invasive Species

Of the other forms of transportation that affect the North American environment, marine transportation is increasingly important. The United States is the world's largest trading nation and accounts for nearly 20 percent of world maritime trade. More than 95 percent of US foreign trade, excluding that with Mexico and Canada, is conducted by sea. With the relaxation of trade barriers, it is expected that international trade will triple by 2020, with 90 percent (by weight) moving via the ocean. The nine million barrels of oil imported daily to the United States, largely by water, is the largest single commodity handled anywhere.

²³ CEC 2002.

²⁴ In May 2002, the CEC released its sixth *Taking Stock* report on North America's toxic releases. The combined data used for the analyses in the report are based on 1999 US and Canadian data pertaining to the release and transfer of toxic metals and other toxic substances in the respective countries. The current report also analyzes trends in the data from 1995 to 1999. *Taking Stock 1999* (as well as the reports for previous years) can be found at <www.cec.org>.

A major issue facing natural resource management and conservation of biodiversity is the invasion of non-indigenous or alien species to North America. It is estimated that in the United States alone, over 6,000 self-sustaining populations of non-indigenous animals, plants and microbes have been introduced.²⁵ The growing number of invasive species introduced to North America through increased travel and trade also poses serious threats to native biodiversity, including competition, predation, disease, parasitism and hybridization.

Do Pollution Havens Exist?

One of the centerpieces of the trade-environment debate has been the assertion that differences in environmental regulations between countries would induce a change in the location of pollution-intensive sectors, from jurisdictions with stringent environmental standards to those with either lower standards or lax enforcement procedures. This “pollution haven” hypothesis hinges on the assumption that companies facing higher environmental standards also face a competitive drag that becomes especially acute in global markets. With capital becoming more mobile, and environmental capital and operating costs for some pollution-intensive sectors like electricity generation or the chemicals sector often exceeding five percent of total costs, the pollution haven hypothesis assumes that when making strategic investment decisions, regulatory differentials can play an important role.

The pollution haven debate has been clouded by confusion that environmental regulatory differentials are the only factor that explains changes in location. Clearly, there are other factors that are more important: these include labor markets, including not only wage costs but also the level of skill of the labor force; market proximity or access to markets; infrastructure and information issues; political stability; and many others. The importance of environmental regulations in determining where investments are located is, on average, secondary when compared with other factors affecting FDI location decisions.

However, work presented at the CEC symposium suggests mixed results.²⁶ Taken at the aggregate level across all sectors, there is little empirical proof in support of widespread pollution havens. Another quantitative economic model, which tracked changes in the location of pollution-intensive industries in relation to levels of environmental standards within the United States, found no evidence of a pollution haven effect.

Another study presented at the CEC symposium examined whether differences in domestic environmental regulations between the United States and Mexico in the textiles sector and, in particular, the manufacturing of denim, could shed light on the huge shift in the location of textile manufacturing plants from north to south since NAFTA came into force.²⁷ Since NAFTA was implemented, thousands of textile jobs have moved from the United States to northern Mexico. For some communities, such as El Paso, Texas, this loss in employment continues to be a dramatic blow to local communities.

The study did find that differences in the enforcement of environmental regulations between the US and Mexico have played a contributing role in the locational shift in textiles production from the north to south. How much of a role remains difficult to quantify, and other factors besides environmental policies (notably differences in wages between US and Mexican workers) have played a far more important role.

²⁵ US Geological Survey (1998). *Status and Trends of the Nation's Biological Resources*, volume one, Washington. DC.

²⁶G. Fredriksson and Daniel L. Millimet (2002). “Is There a Race to the Bottom in Environmental Policies? The Effects of NAFTA.” In CEC 2002.

²⁷ Andrea Abel and Travis Phillips (2002). “The Relocation of El Paso’s Stonewashing Industry and Its Implications for Trade and Environment.” In CEC 2002.

However, the most dramatic evidence confirming the pollution haven effect involves the international trade in hazardous waste.²⁸ Since NAFTA entered into force, a nearly five-fold jump in hazardous waste imports to Canada from the United States has occurred. The bulk of those hazardous wastes has been imported into the Canadian provinces of Quebec and Ontario.

This increase of well over 400 percent in hazardous waste imports into Canada from the United States has come primarily from US steel and chemical sectors. At the same time, both sectors have undergone an absolute decline in waste generation in the United States since NAFTA. Hence, the increase in imports cannot be explained by an increase in the total volume of wastes generated. Instead, it is best explained by the widening gap between the two countries in the cost to industry of meeting hazardous waste environmental regulations. One measure of the difference in regulatory stringency is found by the fact that budgets for environmental protection, both at the federal level and in several provincial jurisdictions, have declined dramatically since NAFTA. In the case of the Canadian federal government, there is evidence that from 1994 to the late 1990s, as policy makers shifted their attention to reducing budget deficits, spending on environmental protection—including monitoring and inspection—plummeted by as much as 40 percent.

The lesson of the hazardous waste example goes against a basic assumption of environmental policy priorities during market liberalization. Since the early 1990s, the OECD, World Bank, UNEP and many other impartial organizations have clearly noted that trade liberalization in and of itself is unlikely to be a main cause of environmental degradation. The magnitude of increases to air pollution emissions linked to NAFTA noted above is marginal, in the upper boundary of two percent. However, to ensure that scale and other negative effects of liberalization remain at a minimum, environmental policies must be robust, especially during transitional periods in which liberalization spurs changes in the extent of economic activity between sectors and countries. The Canadian hazardous waste story is a vivid example of what happens when domestic environmental policies are weakened precisely at the time that liberalization and open markets occur.

Environmental Impacts of Increased Freight Transport

Environmental effects at the sector level are mixed. For example, a robust and direct link between free trade and changes in environmental quality can be traced to the increase in international road freight transport since NAFTA. Research shows an absolute increase in air pollution concentrations at Mexico-US and US-Canada road border crossing points, due to the scale effects of increased road freight transport. Improvements in infrastructure in border areas have not kept pace with this expansion, so that air pollution has been particularly exacerbated by border truck transport congestion and related engine idling. The most affected by this increase in environmental pressure are towns and cities adjacent to border crossing areas. In addition to an increase in various kinds of air pollution, border communities have been adversely affected by increased noise pollution and other kinds of environmental pressures.²⁹

The Regulatory Clash: NAFTA Chapter Eleven, Investment

It is very hard to identify any cases of actual regulatory chill at the federal, state/provincial or municipal levels, based on the small number of cases. However, what has ignited public concern almost as much as the findings themselves, is the opaque manner in which NAFTA dispute settlement procedures occur. Indeed, it has been noted that while WTO dispute settlement procedures are a source of concern among the environmental community because of secretive

²⁸ Marisa Jacott et al. (2002), see note 9, *supra*. In CEC 2002.

²⁹ Rachel M. Poynter and Sheila A. Holbrook-White (2002). "NAFTA Transportation Corridors: Approaches to Assessing Environmental Impacts and Alternatives." In CEC 2002.

manner, the WTO proceedings appear considerably more transparent and accessible to civil society, compared to those under NAFTA.

At the same time, just as trade policy has increasingly involved setting rules on measures applied behind the border, it has also become concerned with laying out rules affecting how public agencies can minimize the risk of products having an adverse effect on human health or the environment when they enter domestic markets. For example, new trade rules disciplines concerning how risk assessment ought to be done mark a dramatic blurring of where trade policy ends and domestic human health and environmental protection begins. The recent debate between trade and environmental experts over the operational implications of precaution was cited as a case in point of the difference between trade and environmental objectives.³⁰

Of more immediate concern was the effect that new NAFTA provisions relating to investment liberalization were having on eroding or challenging hard-fought environmental regulations. To date, roughly 15 NAFTA Chapter Eleven investment cases have been formally launched or settled before final adjudication. Among the most important are Chapter Eleven cases involving investor-state disputes over domestic environmental regulations.

Rules intended to safeguard foreign investors from discrimination and expropriation have led to several disputes that have either been settled out of court (such as the Ethyl Corporation versus Canada over the ban on MMT), or have proceeded (such as the Desona, Metalclad and Methanex cases).³¹ Such cases have emerged as the single most controversial area of NAFTA, from a trade-environment perspective, appearing to confirm the worst-case scenarios about the regulatory paralysis expected through the trumping of environmental regulations by trade rules.³²

Public concern about NAFTA has increasingly focused on the possible spillover effects of Chapter Eleven cases into other areas of environmental policy and resource management. Such concerns include the potential challenge of efforts within countries to conserve freshwater resources through, for example, the prohibition of bulk water transfers, including exports. For example, a standing Chapter Eleven dispute involving a claim by Sun Belt Corporation of California versus Canada for \$10.5 billion, arising from a decision of British Columbia to prevent Sun Belt from exporting billions of liters of water from that province, has raised public alarm that by making freshwater a commodity, export prohibitions will be overruled by NAFTA dispute arbitration.³³

While Chapter Eleven remains the most important way in which NAFTA differs from the Uruguay Round, it is hardly the only way. Other areas include NAFTA Chapter Twelve cross-border trade in services provisions. True, services commitments first broke ground in trade rules with the Canada-US Free Trade Agreement, and are contained in the WTO package. However, NAFTA services provisions have been described as a “GATS-plus” accord, forming the most detailed package of services trade liberalization ever achieved in an international negotiation.³⁴

³⁰ Howard Mann (2002). “Assessing the Impact of NAFTA on Environmental Law and Management Processes.” In CEC 2002.

³¹ See Howard Mann and Konrad von Moltke (1999). “NAFTA’s Chapter 11 and the Environment: Addressing the Impacts of the Investor-State Process on the Environment.” Winnipeg: International Institute for Sustainable Development.

³² See Hufbauer, Gary, Daniel C. Esty, Diana Luis Rubio and Jeffrey Schott (2000). “NAFTA and the Environment: Seven Years Later.” *Policy Analysis* 61. Washington, DC: Institute for International Economics. See also Mann, Howard and Konrad von Moltke (1999). *NAFTA’s Chapter 11 and the Environment: Addressing the Impacts of Investor-State Process on the Environment*. International Institute for Sustainable Development.

³³ Christine Elwell (2002). “NAFTA Effects on Water: Testing for NAFTA Effects in the Great Lakes Basin.” In CEC 2002.

³⁴ Dale Andrew (2002). “Services Trade Liberalization: Assessing the Environmental Effects.” In CEC 2002.

NAFTA and Renewable Natural Resources

The effects of NAFTA on the sustainable management of renewable resources appears mixed, and depends on the resource examined. NAFTA has had little impact on the sustainability of North American fisheries at the aggregate level. Most trade in fish and fish products was duty free prior to NAFTA, and therefore tariff-related liberalization has been negligible. NAFTA may have relieved pressure on fisheries in Mexico on the margins, by increasing the substitution of imported fish for domestic catches. Non-NAFTA fish trade, and in particular trade between North America and Asian countries, remains substantial, and international trade may be linked to the chronic over-fishing that plagues much of the world's fish stocks.³⁵

The effects of NAFTA on the forestry sector have been marginal, particularly given very low pre-NAFTA tariff rates. Case studies suggest that with NAFTA, foreign direct investment into Mexico's forestry sector has increased competition within the country, placing pressures on the remaining Mexican-owned paper and forest product companies to lower production costs to remain competitive in world markets. Although empirical evidence is scarce, what there is suggests that increased exposure to international competition may increase pressures on wood processing companies to circumvent environmental controls, thereby making sustainable forestry management practices difficult.³⁶

Trade liberalization may also indirectly compound environmental and human-health stresses associated with intensive farming. Among the causes of the drinking water contamination crisis in Ontario has been the increase in intensive animal farming, along with a retreat of regulatory authorities, a transfer of various responsibilities to the municipal level (including the privatization of water management) a disruption in the chain of reporting and responsibilities among the appropriate authorities, and significant reductions in environmental budgets.³⁷

The Agricultural Sector

Since NAFTA, growth in trade and investment in the agricultural sector in North America has been significant. For example, since NAFTA, US exports of agricultural produce, food and processed foods to Canada and Mexico have grown by over 50 percent, from the 1989–1993 to 1994–1998 periods. US imports from Canada increased by 76 percent, while imports from Mexico grew by 53 percent during the same period. By contrast, agricultural trade worldwide over the same period grew by 33 percent.

There have been important differences in trade intensities between agricultural groups. For example, the export of Canadian tomatoes grew by an astonishing 3,000 percent since NAFTA; the bulk of tomatoes are grown in greenhouses in southern Ontario. The most significant increases in US exports to Mexico since NAFTA have been in beef and veal (with exports increasing four-fold), followed by a near-doubling in grain and feed and vegetable products.

Perhaps more dramatic than growth in trade, though, has been the vertical integration of the agricultural sector, driven in large part by increased foreign direct investment. US FDI into Mexico's food processing sector increased from US\$2.3 billion to \$5.0 billion from 1993 to 1997. In Canada, FDI increased from US\$2.5 to \$5.2 billion between 1990 and 1997.

³⁵ Grace V. Chomo and Michael J. Ferrantino (2002). "NAFTA Environmental Impacts on North American Fisheries." In CEC 2002.

³⁶ María Teresa Guerrero, Francisco de Villa, Mary Kelly, Cyrus Reed, Brandon Vegter (2002). "The Forestry Industry in the State of Chihuahua: Economic, Ecological and Social Impacts Post NAFTA." In CEC 2002.

³⁷ Christine Elwell (2002).

The success of a narrow range of modern plant breeding raises both short-term and longer-term issues. Increased reliance on modified plant forms poses potential risks to the long-term stability of crop production and the threat of widespread and potentially catastrophic plant/pest disease. For example, the main threat to yield stability from modern plant varieties is the increasing uniformity, and continuous cropping, typical of modern varieties.³⁸

The farm sector is increasingly being divided into two kinds of production: large-scale or factory-type livestock lots or food processing operations, and smaller-scale, family-run farms. This concentration into large-scale, capital-intensive food processing industries is most pronounced in pig and poultry production, wine-making, the cattle feedlot sector, irrigation crops such as cotton, and other intensive horticulture crops.³⁹ Small-scale farms, especially in developing countries like Mexico, typically rely in a variety of crops and other inputs for production. However, recent trends are toward the adoption of modern agricultural production, even within small farms. Modern farm production is increasingly based on the simplification and specialization of farm-gate production.

Such specialization involves myriad changes in farm production, including a shift to external sources for numerous farm components. As production becomes standardized, one can assume that external components will themselves become increasingly homogenous. At the farm level, this shift entails the replacement of subsistence-household farm items by market-produced alternatives; traditional seed stock varieties by modern, often hybrid, cultivars; natural, lower-impact pest control by chemicals; natural byproduct fertilizer by commercially produced supplements; locally produced animal fodder by market-supplied feed; and household and wage labor by mechanization. Changes are occurring in land tenure and in institutional services: for example, as farm output diversity dwindles, its stabilizing and hedging effects are being replaced by social and market-based insurance.⁴⁰

The effects of production concentration, market consolidation and specialization are complex to measure on a systematic and aggregate level. In principle, the economic benefits of specialization are often touted by trade economists, and hinge on efficiency gains that are passed along to consumers through lower retail food prices. This in turn contributes to general welfare gains. However, as food markets become increasingly consolidated (roughly 250 significant mergers and acquisitions take place in the US alone each year in the food processing sector) and vertically integrated (research and development, production, transport, marketing and advertising, and retail distribution are under one corporate roof), some suggest that savings are passed along to processors and retailers rather than to consumers through lower prices.⁴¹

Methodological Issues

A great deal of attention has been paid to questions of methodology over the past decade. Rather than undertaking an assessment of trade agreements, considerable attention has focused on “how to” undertake such assessments. This focus on methodological questions has led some, usually lawyers, to argue that environmental assessment work is too theoretical, academic or opaque. This frustration has only increased as assessment work turns to a toolbox of different economic models, including

³⁸ Robert Tripp and Wieneke van der Heide (1996). “The Erosion of Crop Genetic Diversity: Challenges, Strategies and Uncertainties.” In *Natural Resource Perspectives* series. London: Overseas Development Institute.

³⁹ Dennis Henderson (1999). “Between the Farm Gate and the Dinner Plate: Motivations for Industrial Change in the Processed Food Sector.” In Reza Lahidji, Wolfgang Michalski and Barrie Stevens (1999). *The Future of Food: An Overview of Trends and Key Issues*. Paris: Organization for Economic Cooperation and Development.

⁴⁰ See Henderson 1999.

⁴¹ It is argued that with market concentration, the importance of bulk commodity markets and auction systems declines, there is a shift to increasingly thin market channels, and auction prices become an “irrelevant” reference for contract prices. See CEC 2002, forthcoming. *Understanding and Anticipating Environmental Change in North America: Building Blocks for Better Public Policy*. Montreal: Commission for Environmental Cooperation.

general equilibrium models, partial equilibrium models, econometric models, input-output models and other tools.

Typically, methods are organized around one of two reference points. The first, and by far the most common, comprises forward-looking or anticipatory assessments. Known as *ex ante* assessments and reviews, they involve estimating future environmental policy and environmental quality effects that might arise because of trade liberalization commitments that are currently being considered or under active negotiation. There are strengths and weaknesses in this approach, which forms the basis of environmental assessment or review work currently being pursued by Canada and the United States, as well as the European Union and Norway.

The strength of *ex ante* approaches revolves around their promise of policy relevance: by estimating potential environmental impacts before they occur, *ex ante* assessments hold the promise of influencing trade negotiations, as well as preparing environmental policies to absorb potential impacts. Anticipatory assessments or reviews have made impressive gains since NAFTA and the WTO were created, in particular, around linking economic forecasting (and economic models) with some environmental indicators (usually indicators of air and water pollution). The drawbacks of *ex ante* assessments are two-fold. First, because they are based on potential economic outcomes driven by trade negotiations, they are almost impossible ground-truth. For example, assessments by the EU on implications of a new WTO round will be based on the assumption that the negotiating position forwarded by the EU will be close to the actual outcome of an agreement. Given that there are now over 130 WTO members, this basic assumption is unrealistic. Second, critics have argued that *ex ante* assessments are more about selling free trade packages and less about undertaking rigorous assessments.

The other main approach comprises *ex post* assessments. The strength of this approach is that it at least has the possibility of being based on empirical data.

In isolation, *ex post* analysis very much looks like an autopsy, while *ex ante* work has the goal of initiating anticipatory policies, without a robust empirical base, during what usually is a dynamic and quickly changing negotiating process. However, if one takes what one knows from *ex post* analysis to help deepen probable scenarios under *ex ante* work, one can envision a policy loop in which environmental policy is able to respond to trade-related pressures, or the existing or proposed trade policy is altered.

Environmental assessment of trade focuses mainly on anticipatory or *ex ante* assessments. This focus on *ex ante* assessments is adopted by formal governmental assessments underway, including those by Canada and the US: both examine the likely future environmental impacts of emerging trade policy agenda, including the effects of the built-in agenda of the WTO, the implications of the FTAA, the effects of bilateral trade agreements (for example, the Canada-Chile accord or the US-Jordan trade agreement), and most recently, the impacts on the environment resulting from the Doha Ministerial Declaration.

This focus on future environmental effects of free trade in turn reflects the interest of the public and civil society generally in influencing ongoing negotiations of future accords, as opposed to monitoring agreements that are in place. Indeed, evidence suggests that nongovernmental organizations (NGOs) concentrate their attention in the international environmental arena on emerging international conventions and treaties that are being negotiated. By contrast, NGOs are “surprisingly inactive” in monitoring the implementation of such agreements after they have been concluded. (In comparison, industry groups pay more attention to the implementation stage of international treaties.⁴²)

⁴² The above observations focus on the role of environmental NGOs during the negotiation of international environmental agreements. The authors note that in “most areas of international environmental law, public interest groups are

Which Environmental Indicators?

This relates to the familiar challenge to develop environmental indicators at the aggregate level, capable of showing whether the “environment” as a whole is getting better or worse. In the past decade, much progress has been made in developing such aggregated indicators, intended to be compilations in the same way as GDP or other economic indicators, of diverse measurements of environmental quality. Work by the Scientific Committee on Problems of the Environment (SCOPE), the United Nations Environment Programme (UNEP), the World Resources Institute (WRI), and the Organisation for Economic Co-operation and Development (OECD) points to progress in developing aggregated, quantitative indicators capable of showing changes in air or water quality, based on changes in total pollution. However, progress in honing non-pollution indicators capable of showing changes in biodiversity, forest cover, habitats and ecosystems remains less developed and certainly less quantitative than pollution-related indicators. One example of very highly developed environmental indicators is the “Living Planet Index”), which shows changes in the natural wealth of the Earth’s forests, freshwater ecosystems, and oceans and coasts.⁴³

The reason aggregated environmental indicators are important to the public debate over trade and environment, and globalization more generally, is that it remains difficult to place in an environmental context changes in the rate and pattern of economic growth. That is, economic indicators regularly tell policy-makers and the public if markets are getting bigger or smaller. From there, policy debates are launched as to whether the economy is expanding too quickly and overheating, or contracting too fast. By contrast, disaggregated environmental data tell policy makers if particulate matter emissions are on the rise, or forest cover is shrinking. However, they rarely allow for insights into the overall state of the environment.

The question of environmental indicators is relevant both to the trade-environment debate and to larger concerns about the global economy and environmental quality. Economic and trade-related data tells us that the economy is growing or shrinking overall, as well as what is happening within the economy in, for instance, consumer spending, domestic savings, housing starts, inflation, employment, etc. By contrast, environmental data can tell us with considerable accuracy that some indicators of environmental quality are improving, others worsening, and many remain largely unclear.

Income and Equity Effects Linked to Trade

Well before the 1992 Earth Summit, the nexus of trade and environment had widened to include the notion of sustainable development. One of the pillars of sustainable development is the relationship between economic growth and equity. An important feature of equity is income distribution. The feedback mechanism between income distribution and the environment has been well documented in the economic literature. Indeed, since the 1970s, it has been recognized that poverty is a leading cause, and consequence, of environmental degradation.

A guiding assumption of trade liberalization is that, over time, income levels between trading partners tend to converge. However, evidence suggests a divergence of per capita income appears to

increasingly vocal during negotiations to form new legal instruments, but have been surprisingly inactive during the implementation of the process. Contrary to conventional wisdom, we find it rare for such groups to serve as ‘watchdogs’ to verify that nations have implemented their international commitments. This inactivity reflects [the fact] that few groups devote resources needed to build expertise and gather information to enable them to perform such functions during the implementation process.” David G. Victor, Kal Raustiala and Eugene B. Skolnikoff, eds. (1998). *The Implementation and Effectiveness of International Environmental Commitments: Theory and Practices*, Cambridge: MIT Press.

⁴³ Loh, Jonathan. (2000). *Living Planet Report 2000*. Gland, Switzerland: UNEP World Conservation Monitoring Centre, and WWF-World Wide Fund of Nature. See also OECD Environment Directorate. (2001). *Key Environmental Indicators*. Paris: OECD.

be taking place in some instances. This has raised the question as to how free trade is affecting the distribution of income.

The question of income effects from free trade suggests that at the aggregate level, income in all three countries has risen in the past decade. However, evidence also suggests earnings inequality between higher wage and lower wage groups in Canada and the United States has not narrowed over the past two decades, and that the gap has widened slightly faster in the US than in Canada during this period.

In Canada, the poorest three-fifths of households made less at the end of the 1990s than they did a decade before, when the Canada–United States Free Trade Agreement (FTA) was signed. At the same time, the wealthiest one-fifth of Canadian households saw their assets grow by almost 40 percent from 1984 to 1999, while the poorest one-fifth of Canadian households saw asset values actually contract. A similar pattern is taking place in the United States, in which the incomes of the poorest one-fifth of households contracted in absolute terms by 2.4 percent in the past decade.⁴⁴

Of the three countries, Mexico appears to have the most significant gap in income groups. There is mixed evidence as to whether that gap is closing or widening, and even less clarity regarding the extent to which NAFTA and related liberalization initiatives have been driving forces in changes in relative income levels. The evidence, though, suggesting a widening in the poverty gap within Mexico indicates the most pronounced divergence occurring between the northern and southern states, with the latter continuing to experience an absolute contraction in income levels.

Post-NAFTA economic growth and export intensity has been concentrated mainly in the northern states of Mexico, reflecting the fact that growth has been highly concentrated in specific regions and along fairly clearly defined economic clusters. To illustrate, Monterrey remains concentrated on cement, glass and beverage exports; Tijuana and Guadalajara on electronics and telecommunications; Chihuahua and Saltillo on the automotive sectors. Evidence suggests that while economic and export growth has been very strong in this region, integration between the export and domestic economies is weak. Economic expansion also remains relatively weak, with few domestically-produced inputs in the value-added production chain.

By contrast, economic and income growth in the southern states—in particular Oaxaca, Tabasco and Guerrero—have moved in the opposite direction since 1996. Income levels in Oaxaca are roughly one-quarter the levels in Baja. However, what is truly noteworthy is that income levels in the southern states have contracted during exactly the same time that the northern states have expanded. Since 1994, a contraction in per capita GDP has occurred in lower income regions.⁴⁵

From an environmental policy perspective, the question is whether this divergence in income levels is important. There are two specific reasons why it is. First, it has long been recognized that poverty and inequality—measured, for instance, in the Gini coefficient—are important reasons for environmental degradation in general, and the degradation of marginal lands, habitat erosion and biodiversity in particular. Durable conservation plans are difficult to put in place when communities are worried about real losses in economic opportunity. Second, the southern states of Mexico—the

⁴⁴ John F. Helliwell (2000). “Globalization: myths, facts, and consequences.” C.D. Howe Institute Benefactors Lecture, 29 October, at Toronto; and Doug Norris (2001). “A plague on our houses: the 2001 Census, opportunities and challenges.” Joint Panel Session organized by the Canadian Population Society (CPS) and the Canadian Association for Research in Home Economics (CARHE) 27–28 May. Ste-Foy, Quebec: University of Laval.

⁴⁵ From presentation by Michael E. Porter and Alejandro Ramírez on regional economic clusters in Mexico, preliminary findings, to the international symposium “Strategic Responses to Integration Pressures: Lessons from Around the World,” 29–30 March 2001, at the JFK School of Government, Harvard University. It is important to underline that this contraction in income is not the same as changes in the relative rate of income growth between groups or regions. On a global level, analysis shows clearly that the income gap between rich and poor countries today is wider than it has ever been. However, this gap is largely occurring because richer countries are growing more quickly than poor ones. Nonetheless, both are growing. The case of northern and southern Mexico is different, with the poorer regions showing an absolute contraction in income levels (WTO 2000).

poorest, and getting poorer since NAFTA—are also home to the continent’s richest concentration of biological diversity. The southeastern states of Mexico are home to roughly 10 percent of the entire planet’s constellation of biodiversity, as well as the largest single concentration of Mexico’s estimated 240 indigenous groups. Recent scientific data gathered by the National Institute of Geography of Mexico suggests the annual rate of deforestation in the southern states exceeds 600,000 hectares per annum.⁴⁶

The widening income gap *within* Canada, Mexico and the United States mirrors closely what is happening *between* countries on a global scale: the income gap between rich countries and poor countries has, in the past two decades, widened. A report of the United Nations Development Programme (UNDP) notes that the increase in bilateral, regional and multilateral trade and investment accords that has occurred in the past decade has coincided with the fastest acceleration in gaps between rich and poor ever recorded.⁴⁷ A recent report by the WTO Secretariat describes that income gap as “huge,” with richer countries growing much faster than poorer ones, and income disparities between developed and developing countries on average are widening.⁴⁸

Looking at the UNDP and WTO reports together, an obvious question is whether increased international trade is the cause of the divergence in income levels. The claim that free trade has been the cause of income divergence certainly has some appeal among advocacy groups, although it is difficult to prove. So too is proving counterfactual outcomes, that is, that per capita income would be higher in the absence of NAFTA or the WTO. So we are left with what the empirical literature fairly clearly shows us—that export and import relations, that is, increased international trade between countries, in general lead to a convergence of income between the trading partners at roughly equal rates.

Market Integration and Social Inclusion

Efforts to secure a more “socially inclusive market”⁴⁹ may appear curious to most liberal economists, since growth in GDP per capita is generally assumed to secure increases in general public welfare). Although trade liberalization will entail costs during the transitional period, the important lesson is that benefits, which are evenly and thinly distributed across the economy, will outweigh costs. Put another way, economic and equity costs appear marginal when measured at the aggregate level. However, this is hardly consolation if a particular ecosystem, species, air-shed, fragile coastal marine environment, or community is situated at the margin.

Among the roles of public policy is to provide a kind of social safety net, during periods of market integration. Perhaps the most notable example of this kind of effort is found in the European Union. As European member states continue market integration and the pursuit of the four economic freedoms that define the union, structural and cohesion funds are put in place to close regional gaps between members. For example, the EU allocates approximately US\$35 billion in cohesion transfer funds to address economic, social, environmental, educational and other gaps between the richer and poorer member countries.

In contrast, NAFTA—which has a much more modest mandate than the EU both in policy integration, the creation of supra-national institutions and administrative law more generally—has

⁴⁶ Alejandro Velázquez et al. 2002. *Land Use Data Analysis for the Major Coffee-producing States of Mexico: Impacts on Biodiversity*. Report produced for the CEC. Mexico City: Instituto Nacional de Geografía, UNAM. See also: Environmental Law Institute. 1998. *Aspectos Legales del Manejo Forestal en México*. Research report. Mexico.

⁴⁷ United Nations Development Programme (1999). *Human Development report: Globalization with a Human Face*. New York: United Nations.

⁴⁸ Dan Ben-David, Hakan Nordstrom and L. Alan Winter (2000). *Trade, Income Disparity and Poverty*. Special Study No. 5. Geneva: World Trade Organization.

⁴⁹ Speech by President Vicente Fox (2001), Puebla, Mexico.

devoted scarce resources to address economic divergence problems related to economic integration. Although several institutions have been established parallel to NAFTA, including the Border Environmental Cooperation Commission and the North American Development Bank, their mandate has centered on addressing development, financing, infrastructure and environmental management challenges along the US-Mexico border region. However, no mechanism has been put in place to address the various dislocation effects arising from NAFTA.

The question of institutional mandates to buffer specific adjustment or dislocation effects of policy integration has been recognized in environmental policy for some time. For example, the 1990 creation of the Multilateral Fund, dedicated to extending economic and technological assistance to developing countries to help them meet the targets of Montreal Protocol, represents a first for any international treaty. The same logic lay behind the creation, also in the early 1990s, of the Global Environmental Facility to help developing countries address global environmental problems.

By contrast, broader NAFTA-related policies lack clout to address environmental problems arising from trade-related economic integration. For example, the budget of the Commission for Environmental Cooperation of North America is approximately US\$9 million per year. Its mandate, as its title suggests, is to support environmental policy cooperation among Canada, Mexico and the United States in a wide range of areas, from biodiversity conservation and air quality to the sound management of chemicals and environmental law and policy. Its mandate also includes trade and environment, although the organization has no operational links with any NAFTA body, including the Free Trade Commission or any of the approximately 30 NAFTA ongoing working groups and committees, of which more than ten address environment-related issues such as the labeling of pesticides or automotive emission standards.

Conclusions and Next Steps

In many ways, work on environmental assessments of trade appears to turn traditional environmental policy-making on its head. Rather than confronting an environmental problem and searching for its underlying cause, environmental assessments often appear to begin with a cause—be it NAFTA, the WTO or the FTAA—in search of an environmental effect. Not surprisingly, frustration remains about the lack of progress or breakthrough findings in such work. As approaches have become more sophisticated, employing different models and data baselines, environmental assessments also become more specialized and opaque.

Since environmental assessments have not produced a single “good” or “bad” report card of NAFTA or the WTO on the environment, there have also been suggestions to alter the approach of such work. Rather than estimating first the economic effects that a trade agreement has had, or will likely have, on environmental quality or policies, an alternative approach is to begin first with an estimate of the environmental conditions of a region or medium, and then estimate the extent to which a proposed trade accord would affect environmental conditions. The “environment first” approach presents a range of methodological problems distinct from, but certainly no less daunting than, the approaches noted above. (For example, it remains unclear if such an approach would need to estimate the carrying capacities or pollution assimilative capacities of different ecosystems, including the effects that increased trade would exert on ecosystem integrity.) Moreover, the question of causality—that is, is it increased trade that is bringing about changes in the environment, or other factors—becomes no simpler with the “environment first” approach.

At the same time, the next steps in the CEC’s work will include an “environment first” approach, to complement more traditional approaches. Those approaches include continued analysis at the sectoral level (in the case of the CEC, work will focus on the agriculture and energy sectors) as well as consideration of economy-wide effects. A welcome sign that such work is reaching some

levels of maturity is the recognition that there is no single, “best” approach, model or data set used to determine trade-induced environmental effects. Instead, approaches should make use of whatever tools are available.

Using whatever tools exist will make the results of assessment work more focused. However, it does not make the challenge of ensuring public participation any easier. More work is needed to translate assessment work into a public discourse: one which engages the public as it follows the implementation of NAFTA, and tracks the likely impacts that will result from the WTO Ministerial Conference in Doha and ongoing FTAA negotiations. Evidence clearly shows that civil society has become rigorous in following assessment work, and in undertaking it on its own. It remains rightfully wary of assessment reports presented as exercises in public relations or the marketing of a proposed accord, and will remain engaged in the production of assessments that objectively and thoroughly weigh the costs and benefits of the free trade agenda.

Appendix: Key Considerations concerning the Environmental Impacts of Free Trade gained during the North American Symposium on Understanding the Linkages between Trade and Environment

In late 2000, the Commission for Environmental Cooperation (CEC) of North America invited the public to “road test” a CEC-developed methodology on assessing the environmental effects of free trade. For the first time, trade and environmental experts, government officials from environment, trade, industry and other departments of the Canadian, Mexican and United States governments, private sector representatives, citizen groups, academics and others met to discuss what we know, and what we need to find out, about the links between our changing North American environment and free trade.

During a two-day North American Symposium on Understanding the Linkages between Trade and Environment, findings of the original research papers were presented and discussed. The papers and discussions mark an important step forward in clarifying the complex challenge of assessing the environmental impacts of free trade.⁵⁰

Participants were not convened in order to reach consensus on all topics discussed at the symposium. At the same time, a number of underlying themes emerged from the studies and related discussions. Below is a general summary of some of the key considerations emerging from the two-day symposium, followed by an annex summarizing the findings of some of the papers presented at the event.

1. Examining specific environment-trade linkages should be designed to yield policy-relevant outcomes. At the same time, non-trade-related driving forces of environmental change should not be ignored.

It is widely recognized that environmental assessments of free trade are complex, and remain more or less in their infancy, compared for instance to environmental impact assessments. At the same time, remarkable progress continues to be made in honing assessment methodologies. Work by the CEC suggests that no single or “best” assessment method exists, and that a range of different approaches, models, indicators and means of building meaningful correlations between free trade and environmental change ought to be pursued simultaneously. Work thus far shows a sufficient empirical basis to suggest causality between trade liberalization and trade expansion, and changes in both environmental quality, and environmental policies.

While keeping in mind the importance of free trade accords like the North American Free Trade Agreement (NAFTA)—the principal focus of the CEC’s work, as well as other agreements such as the Uruguay Round agreements of the World Trade Organization—many commentators have noted the importance of taking into account other economic factors linked directly or indirectly with trade liberalization, including changes in investment flows, domestic laws related to attracting investment; and more complex, dynamic and indirect relationships between free trade, production specialization, increased vertical integration of economies, and market concentration leading to very large companies.

2. Large-scale or “macro” studies using aggregate data are only partially useful, and most appropriate when supported by more targeted and disaggregated indicators, including region-specific, environmental-media-specific, and sector-specific analysis.

Broad-scale or “macro” studies supplying aggregate data on overall levels of environmental change at a global, continental or national level suggest, in general, that the environmental effects of free trade have been marginal at best. Such measurements may be useful, in particular, when discussing economy-wide changes driven in part by free trade. However, aggregate

⁵⁰ Published in CEC 2002.

measurements are likely to mask potentially important local or regional environmental impacts. For example, while aggregate data may indicate that, North America-wide, forest cover or fish stocks have remained constant since free trade policies have deepened market integration, such conclusions will likely hide serious strains that occur on local forest ecosystems (e.g., neotropical hardwood) or individual fish species. Similarly, aggregate measurements of air pollution may mask jumps in region-specific air pollution linked with free trade: this is especially true in border areas, in which increased freight transportation is leading to surges in region-specific air pollution from border congestion points.

3. Scale effects of the increased flow of traded goods pose serious challenges to environmental infrastructures and policy implementation.

Increased production, resource exploitation, transportation and energy needs, may overburden or simply saturate many aspects of environmental protection, especially deficient infrastructure. An important focus of environmental assessments of trade is the extent to which various mitigating factors—including overall gains in efficiency, association with trade, accelerated technological innovation, transfer and capital turnover rates, and compositional or structural effects (such as the shift from manufacturing to service economies)—are able to offset scale effects. Moreover, a key question is the extent to which environmental regulations are able to withstand increased trade-related environmental pressures in specific regions (for example, environmental pressures arising from increased transportation). Analysis to date shows mixed results, depending on the sector examined. In the agricultural sector, for example, analysis suggests that scale effects of trade-related shifts to large-scale agri-business operations have not been offset by improved technologies or stronger regulations.⁵¹ Analysis of the liberalization and trade expansion in the electricity sector shows mixed results: on the one hand, there is some evidence of increased technology transfer; on the other, public and public sector investments in energy efficiency and conservation programs have been significantly reduced—at least during the transitional period in which markets move toward open competition.

Structural deficiencies and a stretched capacity to monitor, assess, inspect, enforce and remediate environmental problems represent serious challenges.

There is little evidence to support the notion that greater revenues arising from trade expansion will be moved to bolster the resources of environmental authorities in order to address trade-related scale effects. Indeed, the speed with which trade and other kinds of liberalization are proceeding appear to be overwhelming the capacity of domestic regulators generally (in the financial as well as environmental spheres) to ensure robust oversight of the course and consequences of changes markets. Many fear that, as regulatory capacities become overwhelmed, critical environmental resources, including biodiversity, may be lost during this transitional period, as societies await the arrival of additional resources to address systemic regulatory failures.

4. The lack of high-quality environmental data hampers analysis of trade-environment linkages.

A common theme among experts working on different kinds of environmental and sustainability indicators is that these indicators remain less quantitative, and more elusive, than economic or trade data. Remarkable progress continues in the development of robust and policy-relevant environmental indicators. But at the same time, researchers from environmental as well as economic, financial and trade constituencies lament the lack of availability of targeted local, regional or sector-based environmental data necessary to draw correlations between economic and environmental change.

⁵¹ CEC 2002, forthcoming (see note 41, *supra*).

In particular, researchers called for redoubled efforts to complete the many initiatives underway to monitor and report on key environmental indicators at an appropriate level of detail. A number of participants noted that more of the burden for compiling such information should be shared by the beneficiaries of liberalized trade.

5. Policymakers should not underestimate the importance of evaluating economy-environment linkages in an open, transparent and inclusive manner.

Historically, trade policy has been formulated in a relatively opaque manner, in part to shield negotiators from special interests of sectors likely to be adversely affected by free trade adjustments. By contrast, environmental policy finds its roots in public engagement and advocacy. More recently, a wider public has taken a keen interest in trade policy, especially in the context of globalization.

One of the strongest lessons of the CEC's work in the area of environmental assessments of trade is that outcomes are stronger when the public is involved early, and involved often, in such assessments. Transparency in the process of debating trade-environment linkages invariably leads to stronger public policy outcomes. The work of the CEC in building meaningful public participation in environmental assessments confirms that civil society is highly sophisticated in raising and examining trade-related issues involving environmental change.

6. Policy integration remains weak.

Finally, despite the notable progress that continues to be made in assessing the environmental effects of free trade, evidence remains weak that trade and environmental policies are being integrated as a result of such assessments. To date, growth in trade has not been matched by a comparable growth in environmental protection policies. In some instances, evidence to the contrary (that environmental expenditures have been reduced in tandem with trade liberalization) has led to increased environmental stress. This is especially true in specific instances, such as absolute increases in economic scale and lagging investments in infrastructure, as well as in monitoring and enforcement. Among the most important challenges to the trade-environment debate is that of building opportunities for policy integration.

