

**MEETING HIGHLIGHTS  
ON ASSESSING THE ENVIRONMENTAL EFFECTS OF TRADE  
COMMISSION FOR ENVIRONMENTAL COOPERATION  
17–18 JANUARY 2002  
MONTRÉAL, CANADA**

The Commission for Environmental Cooperation (CEC) of North America hosted a meeting of experts, representatives of the governments of Canada, Mexico and the United States, representatives of intergovernmental organizations and others, on “Assessing the Environment in the context of North American Market Integration.” The purpose of this Note is to provide some highlights of the meeting, held 17–18 January 2002. All papers presented during the meeting can be found at: <http://www.cec.org/calendar/details/index.cfm?varlan=english&ID=1701>.

The CEC Secretariat provided an overview of its past and current focus of work involving environmental assessments of free trade. Since 1994, the CEC has focused on questions of methodology, as well as backward-looking (or *ex post*) environmental reviews of the North American Free Trade Agreement (NAFTA). This work has been supported by a growing number of sector-specific studies. (In early 2002, the CEC released the final version of 13 sectoral studies, ranging from the environmental effects of NAFTA on forestry, hazardous waste traffic, trade in services and fisheries.<sup>1</sup>)

Beginning in 2002, the CEC’s work will expand considerably, by encompassing both backward- and forward-looking assessments. The forward-looking, or *ex ante*, assessments will build upon the lessons of emerging trends work. The scope of the CEC’s work will include not only observed effects of NAFTA, but also environmental effects linked with current and proposed commitments in the World Trade Organization (WTO) as well as consideration of the possible implications of the Free Trade Area of the Americas (FTAA).

After a full decade of experience in environmental reviews, five questions were posed at the outset of the meeting:

- **Methods**: Have “best practices” in environmental assessments or reviews emerged? Should more time be spent on methodological issues, such as the refinement of the Analytical Framework of the CEC,<sup>2</sup> or are efforts better spent on learning by doing?
- **Timing**: When should assessments of trade occur—prior to the trade accord, mid-stream in negotiations, or after the free trade agreement is implemented? The timing question in many ways defines the purpose of the environmental assessments. Current practices divide assessments into either *ex ante* or *ex post* reviews. Ideally, simultaneous backward- and forward-looking assessments would not only strengthen findings, but also improve policy lessons and integration. However, the either-or scenario reflects resource constraints.
- **Scope**: Assessments focus on specific agreements, such as NAFTA or WTO-specific impacts. What constraints arise from trying to delineate environmental effects from specific trade accords?
- **Cooperation**: Canada and the United States continue to undertake environmental assessments/reviews of free trade. Mexico continues to examine the environmental

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<sup>1</sup> Commission for Environmental Cooperation (2002). *The Environmental Effects of Free Trade*. Montreal.

<sup>2</sup> Commission for Environmental Cooperation (1999). *Final Analytic Framework*. Montreal.

implications of economic policy reforms more generally. Do opportunities exist to strengthen cooperation among the NAFTA partners in such assessments?

- **Policy Lessons** : The purpose of environmental assessments ultimately revolves around integrating environmental and trade policies. In practice, this integration remains weak. Are there ways of strengthening policy integration?

## **EMERGING TRENDS IN TRADE AND ENVIRONMENT**

Professor Sylvia Ostry, of the University of Toronto, attributed environmental language in the Doha Declaration (WTO Third Ministerial Meeting) to pressure from nongovernmental organizations (NGOs) and academics. The Doha meeting, held in late 2001, did not fail (as many had predicted). However, the WTO remains a fragile institution, particularly in terms of its public credibility. Many governments and larger corporations have turned to bilateral and regional or smaller-scale trade initiatives as an alternative to the incremental, time-consuming and resource-intensive WTO process. Indeed, the business community increasingly favors regional negotiations (such as the FTAA) and bilateral arrangements as a means to introduce newer issues, including intellectual property rights, trade in services, investment and financial mobility. The increase in these trade agreements confirms this trend.

Interpretation of the Doha Declaration is elusive: it tends to mean all things to everyone. However, some points remain clear: the North-South divide persists; the WTO dispute settlement mechanisms remain the strongest in international law; and the legalistic approach to institution-building is minimalist.

Developing countries, which comprise 80 percent of WTO membership, are a driving force in the WTO, as Doha's strong development agenda indicates. The term "sustainable development" is featured throughout the declaration, mainly through references to capacity building and technology transfer (although these concepts remain largely undefined). Institutional governance and reform were ignored in Doha, though.

Professor Ostry highlighted three lessons that can be drawn from Doha: (i) developing country issues remain the place to concentrate; (ii) public demonstrations against the WTO are dead; and (iii) there is an opportunity for activists to focus on moral issues. Ostry concluded that further research should be conducted on both the privatization of the trade agenda (investment patterns of multinational corporations) and the change in nature of corporate governance.

Professor Konrad Von Moltke, of the International Institute for Sustainable Development (IISD), noted that environmental assessments initially done for NAFTA, following the threat of an environmental action case, are now an accepted part of the international trade agenda. The Doha declaration underlined the importance of environmental assessments of trade agreements.

It is clear, however, that the WTO does not have the mandate or competence to undertake such assessments. In general, the environmental and trade communities employ vastly different approaches to policy changes: trade experts are "policy wholesalers," while environmental experts are "policy retailers." Environmentalists address the environment by breaking it into analytical pieces, such as biodiversity loss, marine pollution, climate change and ozone depletion. This fragmentation may produce inappropriate diagnostics.

In anticipating the new trade agenda, Professor Von Moltke noted that comparative advantage assumptions, which apply to trade in goods, cannot be extrapolated to the trade in services, or to

investment liberalization under the rubric of trade policy reform. Many challenges encountered in crafting agreements for trade in goods become magnified when extended to trade in services. The expansion or inclusion of new disciplines for intellectual property rights and competition are examples.

In looking at next steps in environmental assessments, the following points were noted: (i) take what you can get by making use with the tools that are already available; (ii) concentrate on sectoral studies; and (iii) share expert knowledge. Fostering open exchange among experts and officials engaged in environmental assessments of trade leads to a better understanding of issues, and improve ways of communicating lessons to policymakers. This enhanced knowledge should lead to better policy outcomes.

### **Discussion**

The discussion focused on opportunities to enhance coherence between trade and environment policies. It was noted that environmental assessments, in bringing together different disciplines, offered the opportunity to strengthen policy coherence in principle.

A great of attention continues to be placed on assessment methodologies. There was a general view that no single, “best” model of environmental assessments has emerged, nor should the focus of the CEC’s work continue to be on methodological issues. Instead, the best approach is to use whatever tools and data are available, including finding ways of combining the lessons from *ex ante* and *ex post* reviews.

It was noted that the current focus of environmental reviews, either backward- or forward-looking, risked leaving environmental considerations of trade as a policy appendage. One suggestion forwarded during the meeting would entail an “environment first” assessment, in which environmental conditions formed the contours for how much trade activity could be sustained.

It was noted that according to the Doha Declaration, the mandate of the WTO Committees on Trade and Environment and Trade and Development, respectively, was to monitor—not assess—new trade/development negotiations or sustainable development.

### **THE CURRENT STATE OF PLAY IN ENVIRONMENTAL ASSESSMENTS OF TRADE**

Kevin Gallagher, of Tufts University, summarized some key approaches used in major environmental reviews conducted in North America. Since late 1990s, Canada and the United States have required reviews of major trade agreements under negotiation. Over time, such reviews have become increasingly sophisticated. Compared to earlier efforts, they have applied rigorous quantitative and qualitative techniques as a means to measure actual or potential environmental impacts of a trade agreement. Moreover, such assessments bring high levels of public participation into the trade policy-making process.

Despite the progress already made, environmental reviews remain in their infancy. Four limitations were noted: (i) for trade agreements that induce relatively small economic change (especially when measured at the aggregate level), scarce attention is paid to analyzing marginal environmental costs. However, when such effects are disaggregated by region, sector or environmental media, such impacts can be significant; (ii) for trade agreements predicted to have “economy-wide effects,” the core of environmental assessment rely on estimates derived from controversial economic modeling techniques; (iii) environmental reviews based on estimates from economic models will be as good as the predictions from the economic model; and (iv) many

environmental issues do not lend themselves to quantitative analysis and are therefore largely ignored in the environmental review process.

Environmental reviews can be strengthened in four ways: (a) Broaden the scope of reviews to deal with moving targets. A useful tool in this regard, drawn from environmental futures and trends-related work, is the use of contrasting scenarios. In looking at the scope of such reviews, an open question remains how national reviews deal with extra-territorial impacts. (b) Insights from *ex ante* and *ex post* reviews should be combined, drawing on a variety of methods to estimate the impacts of trade agreements. For agreements that have potentially substantial economy-wide effects, rather than relying solely on (computable) general equilibrium (CGE) models to form the “core” of their analyses, environmental reviews should make use of simpler, more transparent partial equilibrium, input-output analyses, and other techniques to identify primary and secondary effects of a proposed agreement. (c) Expand the range of environmental variables that are being assessed. In the case where *ex ante* environmental estimates are simply impossible to consider, *ex post* analyses, both quantitative and qualitative, should be employed to fill in these gaps. (d) Enhance existing levels of intergovernmental involvement and public participation. For instance, a built-in response mechanism should be included whereby final drafts of environmental reviews discuss the extent to which earlier public commentary has been incorporated into the final draft.

Michael Ferrantino of USITC responded to Dr. Gallagher’s presentation, by concentrating his remarks on the utility of CGE models used in environmental reviews. Economic models used in environmental reviews tend to be transparent, especially if the basic assumptions and intuition behind the models are made explicit. Models with a clearly communicated chain of causation (i.e., “how a model gets you from trade policy to quality of air and water”) enjoy a high degree of confidence among policymakers. Partial equilibrium models enable economists to represent trade in terms of price and quantity, but not in terms of feedback or inter-industry relationships (i.e., how industries buy and sell from one another). Input-output (I-O) models are useful for inter-industry analysis, they form part of CGE modeling, but they do not consider changes in prices, tariffs, and quotas. By comparison, CGE models allow economists to assess inter-industry, inter-sectoral and relative price effects of trade.

Dr. Ferrantino concurred that the choice of the model used in an environmental review depends on the problem being addressed at the outset. Gaining insights into the problem need to be weighed against information cost, data availability, etc. in running models. However, CGE models are appropriate when one is interested in understanding so-called big brush issues, such as the effects of a trade accord on Gross Domestic Product (GDP) or changes in the consumer price levels. Partial equilibrium models offer more disaggregation and a finer level of details.

Claudia Schatan, of the *Comisión Económica para América Latina y el Caribe*, noted that the capacity of environmental reviews to assess the impact of trade agreements differed in Mexico, because (a) assumptions about perfect competition are less realistic for Mexico than for its NAFTA partners, (b) certain environmental outcomes may be more important in Mexico; (c) positive impacts of increased cooperation are larger in Mexico, in such areas as clean technology transfer; (d) the influence of increased public input among communities and NGOs has relatively greater importance since NAFTA, and needs to be weighed; (e) the per capita income distributional impacts of NAFTA and free trade are more pronounced in Mexico, and poverty presents different challenges for policy-makers; and (f) there is a greater tendency for over-exploitation of natural resources in Mexico, compared to other NAFTA countries. Current economic tools do not allow for a clear match between economic phenomena (such as free trade)

and environmental impacts. Therefore, the importance of multidisciplinary approaches to environmental assessments was reiterated.

### **Discussion**

Various problems with current assessments were raised during discussion, including the recurring problem of isolating the effects of particular trade agreements (e.g., NAFTA versus the WTO versus domestic economic policy changes). The importance of understanding trade liberalization as part of a wider “policy package,” which also included monetary, fiscal policy and investment policy changes, was noted. The need to look beyond international economics, and consider domestic environmental policies, was also noted. For instance, since NAFTA, Canada has experienced what one commentator called a “regulatory chill” at both the federal and provincial levels, resulting in a “race to the bottom.” This was not predicted in *ex ante* reviews. NAFTA Chapter Eleven was also cited as being bringing about unanticipated changes to domestic environmental regulations. Consideration of broader issues, such as the overall structure of the economy as well as drivers of changes such as changes in population, technology and government policy, would also enhance our ability to understand the magnitude and significance of answers emerging from various models. Although information and data gaps exist, one commentator suggested that Mexico should undertake an environmental review of trade. Emphasis should concentrate on trade impacts on biodiversity, genetic diversity, and air pollution. The importance of sectoral studies was noted because they allow for “enough control of variables to draw out causal factors,” thereby facilitating analysis of environmental impact due to economic changes. It was concluded that there is no need to find a “perfect” approach to environmental reviews. However, economic models were useful in helping to ensure that environmental concerns got adequate attention during trade negotiations.

## **ASSESSMENT AT THE NATIONAL AND INTERNATIONAL LEVELS**

**CANADA:** Ms. Jaye Shuttleworth of the Government of Canada presented the Analytical Framework for Conducting Environmental Assessments of Trade Negotiations, that was developed by the Department of Foreign Affairs and International Trade (DFAIT) and released in February 2001. The exercise began in early 1999 in the lead up to the Seattle Ministerial when Canada undertook to assess the domestic environmental implications of a new round of trade negotiations at the WTO. In November 1999, as part of this commitment, Canada released a “Retrospective Analysis of the 1994 Canadian Environmental Review of the Uruguay Round of Multilateral Trade Negotiations.” Following its release, work began on the environmental assessment framework for the WTO negotiations. The approach was then broadened for application to bilateral, regional, and multilateral trade negotiations.

The goals of Canada’s environmental review policies include: (i) to assist Canadian negotiators integrate environmental considerations into the negotiation process by providing information on the environmental impacts of the proposed trade agreement; and (ii) to address public concerns by documenting how environmental factors are being considered in the course of trade negotiations. The process for conducting an environmental assessment of trade negotiations involves: initial environmental assessment report, draft environmental assessment report (early stages of negotiations), and final environmental assessment report (at conclusion of negotiations).

Among the challenges to future reviews are: (i) the need to fine-tune methodologies; (ii) limited resources and data, (iii) the ongoing challenges of policy versus project reviews; (iii) the question of causality and correlation problems (noted above, how to distinguish trade-induced environmental change from other economic drivers change); and (iv) timing issues. In the case where negotiations are underway, an environmental review cannot be published since its use is limited to negotiators, other challenges will include: (v) clarity of purpose of reviews; (vi)

sovereignty issues; and (vii) communications between officers from different departments (trade, environment and sustainable development).

**UNITED STATES:** Ms. Alice Mattice, of the US Trade Representative (USTR), presented a background of environmental assessment requirements in the United States. An Executive Order has been in place since November 1999 which requires environmental assessments for major trade agreements. In 2000, USTR established an interagency process—which also sought public input through a range of formal and informal channels—with a view to developing guidelines. These were finalized at the end of that year and reaffirmed by the Bush Administration in March 2001, at which time USTR, the Environmental Protection Agency (US EPA) and the Department of the Interior Department began a formal review of the guidelines.

Reviews of the Jordan, Chile/US, Singapore, WTO, Doha, and FTAA trade arrangements have thus far been conducted. The commitment by the government to release a draft review in the middle of negotiations has proven helpful in getting the public involved. The US has similar timing issues as noted by Canada regarding when is the appropriate time to publish findings. Given confidentiality concerns, an environmental review or assessment report is unlikely to be published prior to the conclusion of negotiations. This timing issue raises civil society concerns. The issue of whether to continue to focus on tariff changes vs non-tariff issues—such as subsidies—continues to be discussed. It was noted that a written environmental review constitutes an important but by no means sole tool within the “trade-environment package.” The US EPA is preparing a state of the environment report to serve as a baseline.

**MEXICO:** Dr. José Carlos Fernández of the *Instituto Nacional de Ecología* (INE) noted that, until recently, the mandate of INE focused on policy-making and regulation. Although there is no official or legal mandate to conduct environmental assessments for trade agreements in Mexico, there is a requirement for an “Environmental Impact Statement” under the General Law of Ecological Balance and Environmental Protection (*Ley General del Equilibrio Ecológico y la Protección al Ambiente*). Mexico has improved its capacity in terms of environmental information although methodological and informational limitations remain.

INE has two other major mandates that go beyond trade and services: to examine the relationship between trade and biosafety, especially with regards to maize and access to genetic resources. These are examined in the context of regulatory compatibility, which is directly linked to intellectual property and trade issues, as well as environment and development concerns embodied in the Convention on Biological Diversity (CBD). This allows one to approach the trade agenda from an environmental perspective, and not just a matter of measuring the environmental impacts of increased trade in goods and services. INE is working on sectoral studies in the context of economic policy changes.

### **Discussion**

Paul Faeth, of the World Resource Institute (WRI), pointed to the relationship between the UN Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC)—which remain independent bodies of experts—as offering the best model of how environmental reviews of trade ought to be structured. The IPCC has resolved many of the issues currently being grappled with in the trade-environment field. For example, they have established a global baseline against which to evaluate environmental effects. Moreover, the various decision-making bodies under the UNFCCC function with extraordinary openness, involving strong participation from different countries and sectors. It also boasts business-NGO collaboration (for example, a joint project between BP, Shell and WRI) not seen in trade-environment discussions. Finally, more energy should be devoted to trade-environment solutions rather than trade-environment debates.

The importance of civil society in contributing to the environmental assessments process along with the openness of the process was underscored, noting that environmental assessments based solely on technical or scientific assessments were no longer valid. The willingness of the Parties to extend environmental reviews to assess the environmental impacts outside one's border was an important issue that has still not been resolved. It was noted that the political hierarchy of differing priorities needed to be weighed when talking about environmental reviews: international trade and economic policies remain at the top of the political agenda, while environmental protection remains near the bottom. It was noted that environmental institutions could learn from trade agreements, in terms of their specificity and strong enforcement mechanisms.

## **LIBERALIZATION OF NORTH AMERICA'S ENERGY SECTOR: ELECTRICITY AND ENVIRONMENT**

An overview of the CEC's work on electricity and the environment under the Article 13 process was presented during the meeting. For information on that work, please see [http://www.cec.org/programs\\_projects/other\\_initiatives/electricity/index.cfm?varlan=english](http://www.cec.org/programs_projects/other_initiatives/electricity/index.cfm?varlan=english).

Among the points raised in discussions was the important link between patterns of investment and environmental effects. Given the liberalization of many North American electricity markets, coupled with market integration, it was important for environmental assessments to examine likely patterns of investment as well as changes in trade flows, in order to anticipate changes in environmental quality.

## **LIBERALIZATION OF THE AGRICULTURAL SECTOR**

Sarah Richardson noted that Article 10(6) of the North American Agreement on Environmental Cooperation (NAAEC) calls for the "ongoing assessment" of the environmental effects of NAFTA. While undertaking this mandate in its early years, the CEC brought together a multi-disciplinary group to study trade, investment, institutional arrangements and other issues, in weighing environmental impacts. This led to the development of the Analytical Framework, released in 1999. The framework was initially intended to assist in qualitative assessments, with the understanding that quantitative measures had to be used in certain occasions. Other social science techniques were employed, such as interviews, empirical studies based on real numbers and trade flows, and public meetings.

Professor Ford Runge of the University of Minnesota divided environmental reviews into three stages: description, prediction, and prescription. The second stage is particularly problematic, because the economic effects of trade liberalization involve moving targets. Because policy prescriptions are drawn from predictions, a clear lesson of reviews is the need to be cautious when making predictions. For this reason, it is important for analysts to be familiar with the sector under study. Finally, he cautioned against using too narrow an approach, even recommending that the analysts develop two approaches, and then use the better of the two.

Glenn Fox offered advice in three areas for conducting sound analysis. First, the choice of method should depend on the focus of the analysis—e.g., economic models, expert opinions, results from literature, trade data, industry environmental data, technical reading of the text of an agreement, knowledge of the industry are options at the disposal of analysts. Second, *ex ante* and *ex post* analyses should be conducted at the same time. Finally, looking at data and results may resemble a scavenger hunt.

Chantal Line Carpentier, of the CEC Secretariat, noted that the purpose of the CEC study <[http://www.cec.org/pubs\\_docs/documents/index.cfm?varlan=english&ID=635](http://www.cec.org/pubs_docs/documents/index.cfm?varlan=english&ID=635)> was not to improve prediction capacity, but rather to improve *ex ante* and *ex post* assessments. Attributing specific changes to NAFTA is difficult due to the GATT/WTO agreement entering into effect in 1995 and Mexico joining OECD in 1994. *Ex ante* predictions made about the comparative effects of NAFTA on Canadian, Mexican and US agriculture were, for broad commodity categories, generally in the right direction, although rarely of the right magnitude. For instance, additional trade between Canada and the US was predicted to be small but turned out to be very important, especially in food processing as well as in bulk commodities.

Reduction in transportation costs had a major impact on NAFTA trade at levels that were not foreseen. Food processing in the agricultural sector was the most affected area. However, intermediate and differentiated goods are aggregated in most models and this trend could not have been predicted. Revenues and price predictions were generally overestimated, and some trade patterns were not foreseen. *Ex ante* analyses based on commodity price forecast (baseline) had expected reductions in government transfers to support farm incomes due to higher prices. However, most commodity prices have decreased since the 1993–1995 period, leading to increased transfer to the farm sector. Not only were governments wrong in their estimates, so was industry. Generally, agricultural production in NA did not increase; it merely shifted from Europe to North America, particularly in the livestock sector, with accompanying economic and geographic concentration.

The agricultural sector is a resource-based industry; thus the income effect does not hold a priori. *Ex ante* models are useful to identify where the impacts will be most felt to target efforts in these areas. For this, cooperation with the IPPC could be interesting given their evaluation of bioeconomic models (that link biophysical and economic models) worldwide. Existing externalities in agriculture also imply that trade liberalization is necessary but not sufficient for sustainable trade.

Dr. Carpentier noted that additional research is needed on (a) foreign direct investment (FDI) and its link to trade; (b) the concentration of farm production and its effect both on competition and biodiversity; and (c) food processing, transport, climate, invasive species and links among them.

Bruce Jenkins, of Agriculture and Agri-Food Canada, responded to the Carpentier presentation by stating that because *ex ante* analyses were based on *ceteris paribus* assumptions, they are much less complex than trying to disentangle the effects of a trade agreement from other market and policy effects in an *ex post* analysis. He noted the need to incorporate as much as information as possible in analysis, including changes in monetary and fiscal policies, as well as changes in environmental regulations. Since outcomes are ambiguous, *a priori*, empirical analysis is required at the sector level. Thus a suite of different types of models used in tandem to fully assess the impacts of trade liberalization is useful. Examples are the outlook for the medium-term, baseline elasticities; farm-level models to predict changes at the farm level; and I-O models to assess macroeconomic impacts at primary and secondary levels in the agricultural sector. Using various types of models interactively helped build the overall picture needed to assess the FTAA. The paper suggests that governments need to improve their analytical capacity for environmental review and should involve the best models that include land changes. He then presented the National Agri-Environmental Health Analysis and Reporting Program that could help the CEC in integrating environmental/ economic modeling and analysis capacity, because it links policy models with biophysical models.



Michael Brody of the US Environmental Protection Agency recommended that assessments should draw upon approaches used in the CEC “Emerging Environmental Trends” work, including scenarios, models, surveys, and a host of other approaches. One way of thinking about environmental effects is to examine counter-factual scenarios, such as “what would be the impact of agriculture in the future in the absence of trade.”

Many factors affect demand for agricultural products and most are not reflected in the models, such as consumer patterns and other uncertainties about future demand. Other stresses on agriculture (e.g., water scarcity, climate change, technological innovations, biodiversity, geographic component) may also be linked to geographic concerns. Dr. Brody noted that trade should not be examined in isolation from other factors. Trade models are helpful in providing some sense of the impact of price changes on the environment. However, the challenge is to be sensitive to the way the future actually unfolds, as opposed to how models predict it will unfold, and react to these changes by monitoring and developing several different policy options.

### **Discussion**

The environmental implications of various non-trade factors, including sudden price or market shocks, changes in consumer taste, the disclosure of new scientific evidence and other factors impossible to predict in models, was underlined by several participants. For example, it was noted that all *ex ante* trade models failed to foresee the Asian financial crisis, and yet this event had more impact on relative prices than NAFTA or other trade accords. The particular importance of public participation when dealing with uncertainty was noted. The fact that modelers learn from their models was also mentioned, as well as whether there were efforts to link economic and environmental analyses through bioeconomic models. Other reasons why models are not good at predictions include: (a) they reflect current market and policy circumstances, as well as the predisposition of trade negotiations, and (b) in the specific case of Mexican maize, prices have been aligned with the international markets in less than three years, as opposed to the 15-year transitional period foreseen in NAFTA, and sudden price shocks are difficult to model.

### **AGRICULTURE AND BIODIVERSITY**

Scott Vaughan and Hans Herrmann of the CEC provided a brief overview of the relationship between trade liberalization and biodiversity. See [http://www.cec.org/programs\\_projects/trade\\_enviro\\_n\\_econ/112/index.cfm?varlan=english](http://www.cec.org/programs_projects/trade_enviro_n_econ/112/index.cfm?varlan=english) for details. Mr. Vaughan noted that the effects of trade liberalization on biodiversity were dynamic and indirect, and involved changes in relative prices (for example through trade disciplines affecting farm subsidies or export credits), as well as more directly through changes in production technologies or production-related inputs. Although more research is needed, there appears to be a robust relationship between the concentration of production/farm methods and free trade. This includes increased production specialization and standardization of inputs and outputs to world markets. Examples of standardization include homogeneous inputs—including a shift from on-farm to external production inputs—increased reliance on agro-chemical inputs for farm produce intended for export markets, the increased narrowing of plant genetic diversity, to a reliance on a very narrow band of crop diversity.

The implications of these and other trade-related changes on agro-biodiversity warrant more study. In particular, free trade—as already noted—appears to favor larger-scale farm production associated with intensive farming. More work is needed on the relationship between free trade, specialization and land-use change, although it was noted that land-use change, including habitat changes or fragmentation, remains the single most important cause of biodiversity loss worldwide.

Hans Herrmann underlined that fact. Loss of biodiversity is of particular importance to Mexico, which ranks as one of the richest mega-diverse countries worldwide. He added that conservation challenges are such that biodiversity priorities must be clearly set, and one should consider regions which provide ecological services of larger benefit to humanity, notably the importance of centers of origin in the co-evolution of cultural and biological diversity. He outlined the impact of agriculture on Mexico's high biodiversity priority regions with examples from the landscape level to the genetic. At the landscape level, 660,000 ha of forest are lost per year due to land conversion. At the community level, the introduction of tilapia—a non-native species—has become an important cause of the endangerment of the white blind eel. At the species level, forest conversion has led to the extinction of the Imperial woodpecker in the Sierra Madre. At the genetic level, local maize varieties are genetically polluted by genetically engineered (GE) maize.

Kevin Parris of the OECD Agriculture Directorate presented the OECD's Agro-Environmental Indicators work, focusing on how this work could be used for policy purposes. Agriculture plays a small part in the economies of the NAFTA countries, contributing only between 1–2 percent of GDP and 3 percent of total employment, although these shares are larger in Mexico. But in terms of its impact on the environment and natural resources, agriculture's role is more significant: accounting for 45 percent of total land use and 40 percent of total water use, except in Canada, where these shares are lower. As well as producing food and fiber, agriculture is also increasingly being required to provide various environmental services, such as habitat for wildlife, acting as a sink for greenhouse gases, and furnishing attractive landscapes. However, there are concerns that the scale of agricultural expansion will place greater pressure on the environment over the coming decades if it is to feed the additional 1.5 billion people in the expected global population of 2020.

Some consider that current farming practices are degrading and depleting the natural resource base upon which farming depends, namely soils, water, and the natural plant and animal resources. In addition, there are concerns that agriculture may be reaching certain biophysical limits in the constant push to continuously increase crop and livestock yields.

Future challenges in improving environmental assessments of agriculture include consideration of various environmental goods and services demanded from agriculture, providing information on the current state and changes in the environmental performance of agriculture, and using indicators for policy monitoring, evaluation and forecasting purposes. For some environmental issues, our knowledge and data are too incomplete to establish trends, for example, concerning the degree of groundwater pollution or the rate at which groundwater is being depleted by farming. Also for a number of areas, notably agriculture's impact on biodiversity, the understanding and measurement of these impacts is still at a preliminary stage of research. In other cases, the linkages between different indicators are understood but are not easy to measure, such as between changes in farm management practices and environmental outcomes.

Further work in seven key areas is required:

- (1) Enhancing the analytical soundness and measurability of indicators (e.g., understanding and measuring agriculture soil carbon sinks, and agriculture's impact on biodiversity, including non-native species);
- (2) Overcoming data deficiencies, enhancing monitoring activities and increasing efforts of the supporting science (e.g., further develop databases at 'relatively' low cost using new technologies);
- (3) Improving interpretation of indicator trends (e.g., better expression of the spatial variation of national-level indicators, appropriate baselines, threshold levels and targets);

- (4) Measuring the external environmental costs and benefits of agriculture (e.g., translate agri-environmental indicators into monetary terms;
- (5) Using agri-environmental indicators to better inform policy monitoring, evaluation and projections (e.g., monitoring agriculture's compliance with water quality standards; evaluating the effects of irrigation water and infrastructure subsidies on irrigation management and water use; and projecting future production, price and trade effects of achieving specific environmental objectives in agriculture, such as reducing rates of soil erosion or groundwater depletion);
- (6) Developing indicators that can help to examine synergies and trade-offs between the economic, social and environmental dimensions of sustainable agriculture (e.g., through farm financial resources; farmer educational levels and water quality environmental indicators; and
- (7) Show the linkages between the three dimensions of sustainable agriculture [e.g., measures of resource productivity (economic-environment) and the health consequences of agricultural activities (environment and social)].

### **CASE STUDY: LIBERALIZATION OF THE MAIZE SECTOR**

Frank Ackerman of Tufts University noted that the most significant change in the maize sector has been the sheer increase in the volume of trade in maize between Mexico and the US. The US exports 1 percent more to Mexico, which imports more maize than before NAFTA. The primary areas of environmental importance in the US maize sector is the increasing use intensity of fertilizers and the associated problems of nutrient runoff, the use of herbicides and insecticides, the over-irrigation of crops and the use of transgenic Bt maize.

The effects of Bt maize on biodiversity and long-term health in the US are unknown. However, it is clear that US states using Bt maize have reduced insecticide use, although it remains high. Concerning herbicides, Ackerman acknowledged that their use was in decline due to the application of the new, highly efficient herbicide, S-metolachlor (though pesticides are always more effective when they are introduced but decline with time as the pest population adapts). He warned however, that this trend might be reversed as companies wishing to market their less effective herbicides mount legal challenges to the S-metolochlor monopoly. Maize output in traditional states has not decreased. Instead, maize yields continue to increase in all states including traditional states, which could mean a switch to modern seeds and less *in situ* genetic diversity.

Professor Alejandro Nadal, of *Col. Pedregal de Santa Teresa*, focused on the effects of NAFTA on the conservation of *in situ* genetic resources in Mexico. He noted that approximately 1.5 million "non-competitive" farmers that were predicted to have been forced out of farming because of NAFTA remain working farmers. They are also important guardians of seed variants. The sharp decrease in maize prices, closely related to the increase in the tortilla prices in Mexico, has increased rural poverty, robbing smaller farmers of the capacity to act in a protective role. This is important because these farmers are located in the areas of the country's richest biodiversity.

Professor Nadal questioned conventional agricultural productivity measures (bushel/hectare) and comparisons between the US and Mexico, since such benchmark comparisons fail to include numerous environmental benefits of growing maize in Mexico. Even the genetic variability in "poor" soils is an important asset in Mexico, as hybrid maize cannot compare to local varieties in these harsh conditions. Yet high yields have increased by 25–30 percent since NAFTA came into force.

Concern over the use of Bt maize was underlined. Despite the moratorium imposed by the federal government on planting transgenic maize, Mexico continues to import Bt maize. The risk of it affecting other crops and plant genetic diversity has been confirmed in several recent studies noted in Professor Nadal's paper.

### **Discussion**

Is economic efficiency—measured for example in farm output per hectare—what we ultimately want? The welfare gains from trade do exist, but full gains are only possible if and when externalities are internalized. In addition, the problem of ill-defined property rights has long been recognized in Mexico: without well-defined property rights, one school of economic thought argues that there is little incentive to internalize environmental externalities, and free-rider problems persist. On the other hand, there is an increasing realization that the protection of biodiversity must include traditional farming knowledge and communities: many biodiversity-rich areas in Mexico are precisely those in which small-scale farms and cooperatives operate.

An important area of research involves land-use change and its links to trade liberalization. Fuller use of existing data, such as those of the USGS, must be made to model land-use change. Environmental targets should be set and indicators like those developed by OECD used to track progress. Better information on the costs and benefits of agriculture are needed.

### **HAVE ENVIRONMENTAL REVIEWS AFFECTED PUBLIC POLICY?**

John Kirton of the University of Toronto posed the following questions to guide the final session:

- **The Policy Payoff:** What has been, and what should be, the impact of environmental assessments of trade agreements on policy?
- **Getting More Value:** How do we get more policy payoffs from these expensive assessment exercises to which so many stakeholders contribute?
- **The NAFTA Party Preferences:** What do the NAFTA Parties want to do with the CEC now that it has well developed capacity in assessment, especially with the new WTO round launched and looming deadlines in the APEC and FTAA, and with the European Union's work on assessments charging ahead?
- **The NAFTA Party Process:** In the next generation of work, will the NAFTA Parties cooperate among themselves in a transparent and inclusive way that achieves results in policy making?
- **Our North American Responsibility:** Can we leave it to others, notably our friends in the European Union, to shape the global regime in ways that reflect our distinctive North American realities? Or do we North Americans have a responsibility to contribute in a more vigorous and coherent way than we have done thus far?

Mariko Hara, from UNEP, noted that that organization has conducted country level assessment projects in 12 countries around the world since 1997. In these studies, the main challenge seems to fall in one of two areas: data constraints and trade-environment linkages. UNEP recently published a "Reference Manual of the Integrated Assessment on Trade-related Policies," that addresses economic, environmental and social aspects of the phenomena under examination. The next set of UNEP country studies will focus on the agricultural sector and ways to identify causal links between trade policies or trade liberalization and the observed environmental degradation and to quantify these changes—two steps that eluded UNEP in previous country assessments.

Dale Andrew of the OECD Trade Directorate indicated that OECD had developed methodologies for environmental assessments of goods in 1994 and of services in 1999. *Ex ante* assessment of Doha services sector are being conducted in the EU (sector to be chosen soon), in Norway (transportation and shipping), the Czech Republic (environmental services), and the World Wildlife Federation (tourism); of agriculture in Norway, the EU, the Czech Republic, China/UNEP; and of bilateral/regional agreements such as US-Jordan (Jordan), EU-Chile, EU-Mercosur, Euro-Mediterranean FTAs.

Methodological issues that might differ with the North American situation include: choice of indicators, country groupings, scenario-building, significance criteria, and resources may differ in terms of time, expertise and costs. Environmental reviews can be put to work by policy integration and enhancing/mitigatory measures, including: 1) altering a subsidy; 2) adjusting premises of the agreement, such as coverage of dispute settlement; 3) addressing timing (i.e., delay implementation until mitigatory measures are in place); 4) creating parallel institutions (e.g., CEC/NAFTA); or 5) abandoning the policy or agreement. His final comment related to post-Ministerial Doha Development Agenda, paragraph 33: “We recognize the importance of technical assistance and capacity building in the field of trade and environment to developing countries, in particular, the least-developed among them.”

Professor David Ervin of Portland State University asked whether environmental reviews have affected public policy. He prefaced his comments by stating that trade liberalization is not sufficient to improve welfare, unless optimal policies are in place to eliminate externalities related to agriculture. He outlined a number of key recommendations and lessons learned with regard to reviews, beginning with the observation that resources for environmental economics have been over-allocated, while work in actual policy outcomes has not received adequate attention. He suggested that environmental reviews target particular market and government failures, as a means of identifying distortions that can be adjusted by policy corrections or interventions. Professor Ervin stressed the need for more cost-effective environmental policies tailored to ensure that trade liberalization is beneficial to society. Specifically:

- Work on environmental and other indicators has been good. However, it has not delivered recommendations that are relevant to the policy making process, nor that capture public attention. Environmental indicators must be brought into the policy making process in ways that are clearly understood and allow them to be effectively used.
- Environmental policy remains disadvantaged in that it lacks common measurement parameters as, for instance, economy-price indicators. There is a need to focus on fewer than 10 indicators that capture environmental change. This reduced number would make it easier to summarize changes in the environment, predict where the drivers of change are coming from, and identify policies needed to deal with such change.
- Although academics tend to mistrust communications, more communications-research partnerships need to be formed to get work out to the public. Indicators and environmental assessments need to relate to people’s everyday lives in order to engage the public on these issues.
- Models used in environmental assessments should be chosen to fit the given policy problem.
- Improving participation in the environmental assessment process will involve more than information-sharing. For example, relevant documents should be shared well in advance of meetings and allowing meaningful public input needs to be improved.
- Many environmental NGOs are beginning to recognize that focusing on government policy alone will not get the job done in the long run. The private sector needs to get involved in environmental assessments from the outset. Businesses have shown that they are often a very strong source of sound policy ideas.

## **Discussion**

A long-standing challenge with environmental indicators is how to engage the public with meaningful information in a way that does not dilute the integrity of the indicators. It was asked whether environmental reviews ask the right questions at the outset. While a lot of attention is focusing on the next round of the WTO or the FTAA, trade liberalization has become so far advanced that ensuing changes may be at the margins. This is particularly true with traditional trade liberalization agendas, such as market access and tariff elimination. However, the environmental policy challenges presented with the new trade agenda, including investment, competition policy, services and intellectual property rights/patent protection, remain largely unknown. The lessons of NAFTA Chapter Eleven on domestic environmental policies were reiterated in this regard.

Within NAFTA, we need to link our environmental work to what is happening on the social side so as to share information and build partnerships. Examples of collaboration were given such as WRI and USDA, to produce a bio-economic USMP model. The need for better inter-agency communication, notwithstanding progress already made in this regard, was noted. Suggestions were given for parliamentary oversight over environmental assessments that would also enhance public engagement.

## **SHARED IMPRESSIONS**

During the course of the meeting, some recurring themes emerged. In noting these common areas, neither consensus nor recommendations were sought during the meeting. Among the areas of shared views were:

- There is no single methodological approach that best captures the environmental effects of trade. Accordingly, analysts should use a menu of approaches. In this regard, the CEC Secretariat will not update or refine the Analytical Framework.
- Sectoral studies remain the best way to undertake environmental assessments. Given differences within sectors, it is important that sectoral specialists guide such reviews.
- Decision makers with relevant expertise should be informed of the status of ongoing trade negotiations, so that they can provide ongoing and relevant input to trade policies. The question of timing and meaningful input raises questions about how to balance the need of secrecy of negotiations with public participation.
- Trade bodies have neither the mandate nor the expertise to undertake environmental reviews of trade.
- Policies that mediate environmental problems linked with trade need to be developed and linked to environmental reviews.
- A clear lesson from NAFTA is that trade liberalization fosters overall and profound structural changes in economies. The case of increased foreign direct investment that has occurred in North America since NAFTA, and in other OECD countries concurrent with the WTO, is a case in point. Changing investment and private governance impacts should be studied.
- There is an opportunity to extend the environmental reviews being conducted by Canada and the US to capture shared regional or global environmental effects. This question of extra-territorial environmental impacts needs to be addressed.
- The problem of the “moving target” needs to be addressed: that is, it is not until the end of negotiations that the exact form of the trade deal is known and some insights into possible environmental effects can be drawn.