

BUILDING A FRAMEWORK FOR ASSESSING NAFTA ENVIRONMENTAL EFFECTS

REPORT OF A *WORKSHOP* HELD IN LA JOLLA,
CALIFORNIA, ON *APRIL 29 AND 30, 1996*

ENVIRONMENT AND TRADE SERIES



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Commission for Environmental Cooperation

A NORTH AMERICAN APPROACH TO ENVIRONMENTAL CONCERNS

Three nations working together to protect the environment

The **Commission for Environmental Cooperation (CEC)** was established by Canada, Mexico and the United States in 1994 to address transboundary environmental concerns in North America. While the idea to create such a commission originated during the negotiations of the North American Free Trade Agreement (NAFTA), it derives its formal mandate from the North American Agreement on Environmental Cooperation (NAAEC).

The NAAEC builds upon and complements the environmental provisions established in NAFTA. It creates a North American framework whereby goals related to trade and the environment can be pursued in an open and cooperative way.

In broad terms, the NAAEC sets out to protect, conserve and improve the environment for present and future generations. How? The parties to the Agreement set out the following objectives:

- to protect the environment through increased cooperation;
- to promote sustainable development based on mutually supportive environmental and economic policies;
- to support the environmental goals of NAFTA and avoid creating trade distortions or new trade barriers;
- to strengthen cooperation on the development of environmental laws and enhance their enforcement; and
- to promote transparency and public participation.

In signing the NAAEC, the governments of Canada, Mexico and the United States committed themselves to a core set of actions, including:

- reporting on the state of the environment;
- striving for improvement of environmental laws and regulations;
- effective enforcement of environmental law; and
- publication and promotion of information.

Mission Statement

The CEC facilitates cooperation and public participation to foster conservation, protection and enhancement of the North American environment for the benefit of present and future generations, in the context of increasing economic, trade and social links between Canada, Mexico and the United States.

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Acronyms

AD	anti-dumping
APEC	Asia Pacific Economic Cooperation forum
Banamex	<i>Banco Nacional de México, S.A.</i>
BECC	Border Environment Cooperation Commission
BEP	Border Ecology Project
CAFE	Corporate Average-Fuel Economy
Canacindra	<i>Cámara Nacional de la Industria de Transformación</i> National Chamber of the Manufacturing Industry
CEC	Commission for Environmental Cooperation
CECEF	Centre for Energy Efficiency (Moscow)
CEMAI	<i>Consejo Empresarial Mexicano para Asuntos Internacionales</i> Mexican Business Council for International Affairs
CIDE	<i>Centro de Investigación y Docencia Económicas</i> Center for Economic Research and Teaching
CMA	Chemical Manufacturers Association (US)
COECE	<i>Coordinadora de Organización Empresariales de Comercio Exterior</i> Mexican Business Coordinating Council for Foreign Trade
Colmex	<i>El Colegio de México</i> The College of Mexico
Concamin	<i>Confederación de Cámaras Industriales</i> Confederation of Industrial Associations
CVD	countervailing duty
DFAIT	Department of Foreign Affairs and International Trade
EU	European Union
ECLAC	Economic Commission for Latin America and the Caribbean
ENGOS	environmental nongovernmental organizations
EPA	Environmental Protection Agency (US)
FCCC	Framework Convention on Climate Change
FDI	foreign direct investment
FTA	Free Trade Agreement (US-Canada)
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
HS	Harmonized System (US)
IADB	Inter-American Development Bank
IJC	International Joint Commission
IMF	International Monetary Fund
INE	<i>Instituto Nacional de Ecología (INE)</i> National Institute of Ecology
IOA	Institute of the Americas
IPPS	Industrial Pollution Projection System
ISIC	International Standard Industrial Classification
JPAC	Joint Public Advisory Committee (CEC)

Mercosur	<i>Mercado Común del Cono Sud</i> Southern Cone Common Market
MNCs	multinational corporations
NAAEC	North American Agreement on Environmental Cooperation
NADBank	North American Development Bank
NAFTA	North American Free Trade Agreement
NARUC	National Association of Regulatory Utility Commissioners
NGO	non governmental organizations
NOAA	National Oceanic and Atmospheric Administration (US)
NRTEE	National Round Table on the Environment and the Economy (Canada)
OECD	Organization for Economic Cooperation and Development
Profepa	<i>Procuraduría Federal de la Protección al Ambiente</i> Federal Attorney General for Environmental Protection
RMALC	<i>Red Mexicana de Acción Frente al Libre Comercio</i> Mexican Action Network on Free Trade
SCOPE	Scientific Committee on Problems of the Environment
Secofi	<i>Secretaría de Comercio y Fomento Industrial</i> Secretariat of Commerce and Industrial Development
Sedesol	<i>Secretaría de Desarrollo Social</i> Secretariat of Social Development
Semarnap	<i>Secretaría del Medio Ambiente, Recursos Naturales y Pesca</i> Secretariat of Environment, Natural Resources and Fisheries
SEU	Socio-Ecological Union
SRE	<i>Secretaría de Relaciones Exteriores (SRE)</i> Secretariat of External Affairs
TRI	Toxic Release Inventory (US)
UN	United Nations
UNAM	<i>Universidad Nacional Autónoma de México</i> National Autonomous University of Mexico
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	US Agency for International Development
USDOC	United States Department of Commerce
USTR	United States Trade Representatives
UV	ultra violet
WTO	World Trade Organization
WWF	World Wildlife Fund

Acknowledgements

The Commission for Environmental Cooperation (CEC) wishes to thank the many people who, in a variety of ways, have contributed to the NAFTA Effects Project in its first phase. First and foremost, thanks go to the Project Team and also to their principal research associates, Julie Soloway, the Research Coordinator at the Centre for International Studies in Toronto, and Jan Gilbreath at the Lyndon B. Johnson School of Public Affairs at the University of Texas in Austin. Research assistance was also provided by Enrique Velasco-Ibarra at Johns Hopkins School of Advanced International Studies in Washington, DC, Ashley Prince at the University of South Florida, Tim Egan, Mary Vanderbilt, Jeffrey Stoub, Olga Sandoval Garcia, Jane Barr and Jean Pierre Laporte. The CEC is also grateful for the institutional support provided by the Centre for International Studies at the University of Toronto, and the assistance of Professor Charles Doran at the Johns Hopkins University School of Advanced International Studies.

In addition, a number of people assisted the CEC and the Project Team early in this process, assembling and analyzing critical background material. Notably, we owe thanks to Dan Esty of Yale University for his assessment of recent attempts to model the effects of trade and economic activity on the environment, as well as his continuing interest and input into the process. As well, thanks is due to Mark Spalding and Marc Stern from the Graduate School of International Relations and Pacific Studies at the University of California at San Diego, who together prepared an index of potential NAFTA effects that were identified during the policy debates surrounding the NAFTA between 1991 and 1994. These contributions are available as Numbers 1 and 2, respectively, of the CEC's Environment and Trade Series of publications.

There are also the wide range of individuals from environmental groups, business organizations and governments who made themselves available to members of the Project Team for the series of specialized interviews that form an important part of the research for this project. The CEC also gratefully acknowledges the work of the NAFTA Effects Advisory Group, whose members have volunteered their time to assist the Project Team and enrich this work.

Finally, the CEC is grateful for the contributions of the Institute of the Americas (IOA), the National Round Table on the Environment and the Economy in Canada (NRTEE), and The College of Mexico (Colmex) for helping to make this workshop a collaborative process. The CEC would also like to acknowledge the important role of the discussants in this process whose public commentary has assisted the CEC in refining its work, as well as the critical role of participants whose reactions have helped to shape the framework of this project.

As this project develops, the CEC looks forward to continuing to broaden and deepen its relationships with the varied individuals and groups who share our interest in NAFTA and the environment.

Sarah Richardson
Program Manager, NAFTA/Environment
July 1996

Introduction

Sarah Richardson

*Program Manager
NAFTA/Environment*

During the negotiation of NAFTA, a lengthy and articulate debate took place in North America. Proponents of trade liberalization were presented with arguments from a wide range of communities and individuals on the potential negative effects of the trade agreement on issues such as the environment. As a result of this debate, NAFTA was signed along with two additional agreements including the North American Agreement on Environmental Cooperation (NAAEC). Under the NAAEC, the CEC was established in Montreal in the summer of 1994. One of the first items on the CEC's workplan was to develop a program area to consider the effects of NAFTA on the environment.

On April 29-30, 1996 in La Jolla, California, the CEC held its first public meeting to consider the results of the research conducted in the first phase of the NAFTA Effects Project. The CEC invited a total of close to 100 people from the three NAFTA countries to attend the workshop and to comment on the approach taken by the CEC's Project Team.¹ The agenda for the meeting closely followed the discussion paper produced for the workshop.² Members of the NAFTA Effects Project Team presented the sections of the research for which they were responsible, and a panel of experts from the three countries then served as commentators. The commentaries were followed by a discussion from the floor by participants.³

The meeting was held at, and co-sponsored in part by, the Institute of the Americas. Other partners were the National Round Table on the Environment and the Economy (NTRTEE), which is an advisory body to the Canadian Prime Minister on sustainable development, and The College of Mexico (*Colmex*), a research and education institution in Mexico City. The workshop was chaired by Pierre Marc Johnson, who was then a vice chair of the NTRTEE, and who also chairs the NAFTA Effects Advisory Group, a group of individuals from the three countries assembled by the CEC to assist in the development of this project.⁴

This report is an attempt to reproduce the content of the La Jolla workshop and ensure that it is available to a broader audience than was able to attend the event. The substance of the discussion and the conclusions will assist the CEC to define priority areas for future work on this project.

Chapter 1 contains an assessment of the institutional context of environmental institutions in the post-NAFTA era of cooperation between the three countries, and includes contributions from Jorge Bustamante and Alfredo Philips Olmedo. Dr. Bustamante is President of the Border Environment Cooperation Commission (BECC) and Mr. Philips Olmedo is the Director General of the North American Development Bank (NADBank). Both institutions are important bilateral initiatives on the US-Mexico border which were established in conjunction with the NAFTA. However, they have no formal connection to the trade

¹ See Appendix A for a list of the members of the NAFTA Effects Project Team.

² The agenda is attached as Appendix B and the discussion paper as Appendix C.

³ A list of participants is attached as Appendix D and biographies of the speakers and the discussants are included in Appendix E.

⁴ A list of the members of the NAFTA Effects Advisory Group is included as Appendix F.



agreement. The chair of the first panel was Victor Lichtinger, the Executive Director of the CEC. He called upon Alice Chamberlain, a US Commissioner at the International Joint Commission (IJC), to say a few words.

In Chapter 2 the project as a whole is outlined. This was undertaken by John Kirton, an Associate Professor of Political Science at the University of Toronto who is the Project Team Leader. Dr. Kirton stressed the importance of developing a framework for this study that would be balanced, causal, concrete and policy-relevant. Following the project overview, changes to both the economic and the environmental rules brought about by the NAFTA were discussed in greater depth. Leonard Waverman, Director of the Centre for International Studies at the University of Toronto, discussed economic rule changes. He suggested that they are critical for study because substantive rule changes will lead to substantive changes in the way decisions are made, including environmental decisions.

Sanford Gaines, a professor at the University of Houston Law Center, commented upon the environmental rules changes. He noted that while there were no environmental rule changes *per se* in the NAFTA or even in the NAAEC, the significant change that has occurred since the NAFTA is in the North American context for environmental protection and environmental management.

Chapter 3 reflects the panel that focused on trade and investment relationships created by the NAFTA between the three countries. The panel was chaired by Colleen Morton, Vice President of the Institute of the Americas. Members of the Project Team responsible for the trade and investment work are Sidney Wientraub, William E. Simon Chair of

Political Economy at the Centre for International Studies, and Rogelio Ramírez de la O., President of *Ecanal S.A. de C.V.* Economic Analysis for Company Planning, respectively. The discussants included Juliet Bender, the Acting Director of the Office of NAFTA at the US Department of Commerce (USDOC), and Adalberto García Rocha, Director of the Centre for Economic Studies at *Colmex*.

Ms. Bender noted the existence of some important changes in trade patterns in North America since NAFTA came into force. This was particularly true in 1994, prior to the devaluation of the peso, when the US experienced record levels of trade with both Mexico and Canada. Dr. García Rocha noted that the impacts of trade barriers on the environment are more important than the impact of trade itself. He questioned the value of linking environmental cooperation to trade, indicating that the effects of trade would be difficult to isolate. By removing the link to trade, one could broaden the scope of the environmental discussion. The Canadian discussant was unable to attend the workshop. In her place, Leonard Waverman offered to say a few words of commentary about Canada-US trade in relation to this project.

Chapter 4 covers the workshop presentations on some of NAFTA's environmental dimensions. This panel was chaired by Richard Kamp, Director of the Border Ecology Project in Bisbee, Arizona. The two members of the NAFTA Effects Project Team responsible for the environmental dimensions of the NAFTA and indicators of environmental quality were Omar Masera, a professor of bioenergy at the Center of Ecology at the National Autonomous University of Mexico (UNAM), and Virginia Maclaren, an Associate Professor in the Department of Geography at the University of Toronto.



The first discussant for the Environmental Dimensions panel was Adrián Fernández Bremauntz at the Environmental Management and Information Department at the National Institute of Ecology (*INE*), of the Secretariat of Environment, Natural Resources and Fisheries (*Semarnap*). Among other things, Dr. Fernández Bremauntz stressed the importance of taking a multi-media approach to indicators and allowing for country-specific approaches, where necessary, to ensure that the indicators are tailored to countries' priorities. He noted that NAFTA has encouraged two important steps forward in environmental management in Mexico. One is increased public participation; the second is increased international commitment and accountability.

The second discussant was Ian Rutherford at Environment Canada, who is Director General of Canada's State of the Environment Reporting Program. Ian Rutherford discussed Canada's experience with its state of the environment reporting and, in particular, its reliance upon effect indicators in conjunction with the pressure-state-response framework for developing indicators.

The third discussant was William Eichbaum, Vice President of the US Program at the World Wildlife Fund in Washington, D.C. He suggested that given the difficulties in attempting a comprehensive study of this nature, the focus should be on posing hypothesis statements that begin with important environmental dimensions of the North American relationship.

Chapter 5 reflects the final presentations at the workshop by members of the Project Team. It includes presentations on connecting economic processes with environmental effects. The panel was chaired by Jonathan Plaut, Chair of the CEC's Joint Public Advisory Committee who, in his

introduction, urged the CEC to recall the principles of the Rio Declaration that promoted sustainable development as an overarching mechanism for considering issues of trade and the environment. Leading off the panel, was John Kirton, the Project Team Leader, who discussed three types of industry central to the NAFTA process and their different relationships to the environment. Further connecting processes, including social and government actors, were presented by Raúl García from the *Centro de Investigación y Docencia Económicas (CIDE)* and David Wilk Graber of *WG Consultores e Asociados* in Mexico, D.F.

Discussants for this panel included Robert Morris, Senior Vice President of the US Council of International Business. He warned of the dangers of increased protectionism that could come about by virtue of misplaced concern about the environment. Michael Tretheway, professor at the University of British Columbia and an expert on transportation policy, followed with a discussion of how the NAFTA might change the use of various modes of transportation and what their relative environmental impacts might be. Alejandro Villamar Calderón, a member of the umbrella social/ environmental group, Mexican Action Network on Free Trade (*RMALC*), was the third discussant. He noted the asymmetries that exist between the economies of North America as well as within the individual countries among groups in society and between sectors.

Chapter 6 reflects the content of the final panel where the governments of Canada and the US presented their reactions to the workshop and to the discussion paper. It also includes a presentation that was made by Héctor Márquez Solís, Director General of Analysis and Implementation for International Trade Agreements at the



Secretariat of Commerce and Industrial Development (*Secofi*). This presentation was delivered the previous day at the workshop, when he provided his perspective on the overall project. He stressed the importance of the new institutional arrangements including the affect of NAFTA on the internal coordination required between national agencies in formulating common policies.

This final panel of the workshop was chaired by Mary Kelly, Executive Director of the Texas Center for Policy Studies in Austin. The first speaker was Laura Kneale Anderson, director for Trade and Environment at the Office of the US Trade Representative. She suggested that, to the extent that the NAFTA Effects Project can provide input on some of the key concerns that surrounded NAFTA negotiations, the CEC has the opportunity to provide an important service to policy makers in the United States and the rest of North America. She stressed the importance of ensuring that the study remain focused and policy-relevant. Peter Fawcett, Deputy Director of the Environment Division in Canada's Department of Foreign Affairs and International Trade (DFAIT) then addressed the workshop.

He stressed the importance of this study in the international context, given the amount of work presently underway in other multilateral institutions on issues of trade and environment, and urged the CEC to build on that work.

The day-and-a-half workshop provoked a great deal of discussion and debate that is not necessarily reflected in the formal presentations that are the subject of this report. Also not reflected here was the very warm welcome that the CEC received from the Secretary for Resources of California, Douglas Wheeler. At the end of the workshop, Chair Pierre Marc Johnson delivered a summary of some of the main points raised. His comments are reflected in this report as "Conclusions from the Chair." In addition, at the end of this report a thorough and systematic attempt has been made to capture the recurring themes and important points that were raised in the discussions. The themes that are identified in the final section raise important points of balance, causation, focus and emphasis. All of these issues will be considered by the CEC in the design of the second phase of the NAFTA Effects Project.



Foreword

NATIONAL ROUND TABLE ON THE ENVIRONMENT AND THE ECONOMY (NRTEE)

Pierre-Marc Johnson

*Vice Chair, NRTEE
Chair, NRTEE Foreign Policy Committee
Chair, NAFTA Effects Advisory Group*

The NRTEE is very pleased to be associated with the CEC for this workshop on the environmental effects of NAFTA. The NRTEE is an advisory body to the Prime Minister of Canada on issues of sustainable development. It is a multi-stakeholder body which considers issues that address the relationship between economics and the environment in a way that is designed to stimulate discussion among the major constituencies in Canada and encourage consensus on a wide variety of issues, including foreign policy. Since 1991, the Foreign Policy Committee at the NRTEE has been considering issues of trade and environment in Canada, at the World Trade Organization (WTO) in the Americas, and in North America under NAFTA. It is in this context that the NRTEE is pleased to support this workshop.

The NAAEC directs the CEC to consider, on an ongoing basis, the environmental effects of NAFTA. In order to carry out this mandate, the CEC developed the NAFTA Effects Project. A Program Manager at the Secretariat works with a Project Team to carry out research and analysis. The Project also has in place an Advisory Group, which meets from time-to-time to discuss the direction of the project. At this workshop, the Project Team will present the work that it has undertaken to begin to develop a framework to assess the effects of NAFTA on the environment. The commentary provided by the formal discussants, as

well as from all of the participants, will be taken into consideration by the CEC in the ongoing work of the NAFTA Effects Project.

INSTITUTE OF THE AMERICAS (IOA)

Paul H. Boeker

*President
Institute of the Americas (IOA)*

The IOA is an independent organization that is affiliated with the University of California. Its primary mission is to contribute to economic and social reform in Latin America. This mandate is carried out in part by identifying and analyzing best practices in a number of areas (particularly the environment), and by spreading awareness and understanding of those practices and their effects through various mechanisms and events with the goal of sharing experiences among the countries of the hemisphere. Much of this effort is focused on helping governments determine how and where to allow market forces to work more freely in a variety of areas, environmental infrastructure development in particular. The IOA does not have any ideological or partisan leanings, but generally follows an agenda set by the priorities in economic and social reform that come from Latin America.

The environment is one of the largest areas of activity at the IOA. Indeed, the Institute helped to start the US-Mexico Environmental Business Committee, which is becoming an international environmental business committee, or set of committees and chapters. The IOA also has a very large program in the area of water projects and water privatization, and helps countries to determine how to secure private funding to expand potable water and wastewater treatment



projects. Furthermore, the IOA is working with the Inter-American Development Bank (IADB) on a project to develop economic and technical approaches to eliminate environmental damage from informal mining (particularly gold mining) in the region.

The task of identifying and monitoring specific environmental effects of NAFTA will not be easy. However, after observing and being involved in environmental enhancement in North America and Latin America for the last ten years, it is clear that there are some long-term trends in the region that are promising for environmental protection.

The first trend is steady economic growth. Economic growth allows per capita incomes to rise, and it has been shown that the demand for a cleaner environment rises with per capita income. The second noticeable trend is the broadening of opportunities for political participation. This will promote greater demand, and more effective representation of that demand, for cleaner water and cleaner air. A third trend is that towards privatization. This includes an effort to obtain more private capital for the faster and better production of infrastructure for a cleaner environment.

Part of the dynamic towards privatization is generated by the terrible environmental records of a number of government companies in the Western Hemisphere. For example, the national oil company of Argentina, and its counterpart in Mexico, both have terrible histories of polluting. Closer to home, one can consider the environmental impacts of many military facilities in the United States. The record is dreadful.

So it is clear that governments are much better at successfully regulating the environmental behavior of private actors than

they are in applying sound environmental practices to their own operations.

Therefore, privatization represents a hopeful trend in a number of these areas. It is almost inevitable that the main effect of NAFTA will be at a very macro level, where the Agreement itself adds to the impact of these longer-term trends: economic growth, broader political participation and privatization. But this impact will be hard to quantify. Thus, it is necessary to attempt to identify some of the more specific linkages between NAFTA and environmental enhancement.

THE COLLEGE OF MEXICO

Andrés Lira González

President

The College of Mexico

This is an excellent opportunity to exchange ideas and comment upon this work. This discussion will allow us to understand better the effects of NAFTA on different aspects of the relationships between our three countries, and in particular on the environment.

The discussion paper prepared by the CEC enables us to understand the progress of various attempts to determine NAFTA's effects on the environment. We have been brought here by the CEC, in collaboration with the IOA (US), the NRTEE (Canada) and *Colmex*, to explore different ideas which will allow us to evaluate the effects of NAFTA.

Discussion surrounding NAFTA and the criticism manifested from its opponents in the three countries, Canada, the United States and Mexico, led to the commitments by the governments to sign parallel agreements on labour and environmental issues. At first, the parallel agreements were interpreted by many as an impediment to the negotiations, such



that NAFTA would never be signed. Nevertheless, both NAFTA and its two side agreements have been viewed to date as positive, even to many who objected to the trade agreement.

NAFTA has mobilized a number of important efforts and resources to protect the environment in the three countries. In Mexico, several policies and environmental programs were developed as a result of discussions surrounding NAFTA and the parallel agreements — including the creation of the Secretariat of Environment, Natural Resources and Fisheries (*Semarnap*).

From an economic perspective, NAFTA has had a number of positive effects, the most well-known of which is expansion of trade amongst the three countries. In Mexico, NAFTA has increased not only the volume but also the diversification of exports away from the current geographic concentration in the export industries along its border with the United States.

NAFTA has also had positive implications for Mexican trade with Latin America. Nevertheless, there is still a long negotiation process ahead with the Southern Cone Common Market (*Mercosur*), as well as the need to find a commercial structure to coordinate the different free trade

agreements already signed by Mexico with other countries in Latin America.

However, NAFTA has also resulted in some negative consequences. This is true not only in the adjustment to an open economy, but also in the proliferation of allegations of unfair trade practices mostly between the United States and Mexico.

At the heart of this meeting is the relationship between the environment and international trade. From this perspective, there are many issues which have not yet been solved, not only in practical terms but also in terms of economic theory. There remain some important questions. Is it necessary to use instruments of command and control to protect the environment, or should economic instruments be used? How can environmental policies be coordinated amongst the three countries? What common policies should North America strive towards?

These and other questions will allow us to reconsider the congruity between the goal of liberalizing trade to benefit North American consumers — the majority of the population — and developing coordinated and common environmental policies. This effort that is underway today should clarify some of these questions.



Chapter 1: The Institutional Context

INTRODUCTION

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Three important environmental institutions were created in conjunction with NAFTA — one trilateral institution, the CEC, and two bilateral institutions, the North American Development Bank (NADBank) and the Border Environment Cooperation Commission (BECC). These new environmental institutional arrangements are an integral part of this study.

The CEC was created as a direct result of NAFTA, by the North American Agreement on Environmental Cooperation (NAAEC) — the “NAFTA side agreement on the environment”. The CEC has been in operation for almost two years and has work underway in a number of areas relating to the themes appearing in the NAAEC. The NAFTA Effects Project falls under the Environment and Economy program at the CEC.

This panel will consider two institutions: the NADBank and the BECC. Although not formally part of the NAFTA, they were created as a result of the process of free trade and economic integration. With the passage of time, both will clearly have a very important impact for the companies, communities, and the environment along the Mexico-US border. In fact, these two institutions are at the center of bilateral relations, commercial relations and social issues in the border region.

A third bilateral organization in North America, the International Joint Commission (IJC), exists on the Canada-US border. A joint American-

Canadian institution, the IJC has been in existence since around the turn of the century. Given its long history of examining issues surrounding water and pollution in the Great Lakes, as well as its important contributions to the development of knowledge and management practices for pollution in the Great Lakes, the IJC is an institution from which North Americans have a great deal to learn.

THE NORTH AMERICAN DEVELOPMENT BANK (NADBANK)

Alfredo Phillips Olmedo

*President and General Director
North American Development Bank
(NADBank)*

The NADBank and the BECC do not form part of the NAFTA *per se*. However, they are derived from the NAFTA regime and were created in conjunction with the NAFTA negotiations, particularly as an initiative of the United States. The NADBank has only two members, the United States and Mexico. That is very important. In some cases, the existence of three members can facilitate problem-solving on difficult issues. With two members having the same voting power, and the same number of members on the Board, it is unclear what will happen if one does not agree with the other. This issue presented itself for the first time with the difficult case of certification from the United States.

The NADBank was created with a capitalization of \$3 billion, payable over four years. Part of this is cash and the other is redeemable capital. Half of the total capitalization has either already been paid and underwritten, or will be shortly. The NADBank currently has capital worth \$1.5 billion. Member



countries contribute to the budget in the same manner as they do to similar international financial institutions. However, the Bank has very distinctive features which set it apart from the World Bank or the Inter-American Development Bank (IADB). First, it operates in both member countries. Neither the World Bank nor the IADB lend or carry out credit operations in the United States. This is a fundamental difference. The NADBank is the only institution of its kind that can lend in the United States.

Secondly, the NADBank only has jurisdiction one hundred kilometres to the north and to the south of the US-Mexico border. Thirdly, the NADBank only deals with environmental infrastructure. Currently, financed infrastructure includes drinking water, wastewater treatment and municipal solid waste disposal projects.

The NADBank faces a number of challenges. Demand for water is enormous in the border area, especially now after four years of drought, and the need for water does not follow the border line. Below the surface of the earth, there are no barriers and the aquifers exist in common. As well, some rivers, such as the Rio Grande and the Nuevo River in Mexicali, flow across the border.

The biggest challenge that the NADBank faces is that these geographic areas and infrastructure activities have traditionally been subsidized. The people living and working along the border are not accustomed to paying for these projects. Mexico is experimenting with privatization. In spite of some opposition to the Bank's financing of private projects, it will continue to finance them. Privatization is a reality in Mexico and so the formula for undertaking these infrastructure projects must be changed.

Under the old formula, questions about who would pay and how did not matter, but under the new one, credit finances projects. However, this requires that the project be clearly laid out, with all of its elements outlined, including those that may have been omitted in the past such as operation and maintenance issues. The NADBank does not want to finance projects only to wonder, later on, who will operate them, or to see them fall into disrepair and thereby become useless. This represents a profound change. It follows a process that is already unfolding in Mexico: the passing of greater responsibility to local authorities to carry out activities related to drinking water, wastewater treatment and municipal solid waste disposal.

Addressing these issues requires new ideas and new mechanisms. It is particularly important to be able to pay attention to small communities with few resources. There are a number of institutions that could help such communities adequately describe the projects upon which both credit and investment operations (whether they be public or private) are made. The NADBank can only finance a project if it has previously been certified (approved) by the BECC, with which it works in tandem from the start of the project-approval process.

The elaboration of appropriate projects to reflect the characteristics of the country in which they are to be carried out is very important. For example, the same criteria will not apply to Naco, Sonora, and Brawley, California. Distinct communities have various needs and idiosyncrasies that must be taken into account.

Sustainable development can only be achieved with sustainable infrastructure. For this reason, the NADBank plays a



fundamental role in the elaboration of this infrastructure as well as in its financial support — or in its lack of financial support, as occurred in a few instances such as Nuevo Laredo, where a plant was completed thanks to the intervention of the Bank and the BECC. In that case, the NADBank and the BECC convinced the authorities of both countries at various levels of government that the plant should be finished. This was to prevent it from remaining half-completed and to assist both Nuevo Laredo and the *colonias* on the American side of the border. The *colonias* are American shanty-towns, similar to those seen in Tijuana or Ciudad Juárez on the Mexican side, which require attention and support to solve environmental problems.

THE BORDER ENVIRONMENT COOPERATION COMMISSION (BECC)

Jorge Bustamante

*President
Border Environment Cooperation
Commission (BECC)*

The BECC represents both a new experiment and a new approach in decision-making regarding a vital resource on both sides of the Mexico-US border — the environment. It deals with different traditions of centralism or decentralism that are related to cultural differences.

This question of values in the functioning of the BECC, along with its special emphasis on public participation, is very important. The BECC's principal function is to certify and approve projects that must then be examined for financing at the NADBank. This certification process must be open and participatory. From the start, this has required a definition of

what is understood as “participatory” in terms of the public. It does not mean the same thing on both sides of the border.

The BECC includes five members from each country. One is from the environmental ministry of each federal government, a representative of a governor from border states, that is to say the governor is usually represented, along with a municipal mayor from a border community, a representative of the International Boundary and Water Commission (IBWC) and an individual not connected to government who is a resident on the border. The latter is the post that I hold. I am the sole nongovernmental member of the BECC from Mexico. Later, I was elected president for the first term, and have since been re-elected for a second term of one year.

In practice, daily tasks at the BECC are the responsibility of General Manager Roger Fraunfelder. The Assistant Manager is a Mexican, Luis Raul Dominguez Terreza. In accordance with the terms of the treaty, these posts will rotate. Because the first general manager is an American, the second will be a Mexican, and the same goes for the presidency of the BECC. The Board of Directors of the BECC, presided over by the president, is the body that has the authority to certify projects. The Board of Directors is very involved in all phases of the decision-making process and is conscious of the great responsibility it has with respect to the success of this important experiment in bilateral cooperation.

The project-approval process at the BECC must allow for extensive public participation. It is on this point that a number of problems have been encountered which stem from cultural differences across the border. For example, while an American



representative might ask for a public hearing in order to have a project approved, a Mexican might suggest that the consent of the community expressed through its municipal mayor is sufficient to go ahead. But that may well not be considered a community decision by an American. To this, a Mexican might reply that the mayor was elected in an uncontested election, is the representative of the community and speaks on its behalf — and so on. In the end, the BECC has reached an understanding and developed a new practice. The Mexican public do not have a tradition of direct input into environmental infrastructure projects that affect them, so for them public participation is a novel experience. Thus, the BECC has made a contribution to the democratic process on the Mexican side of the border and to a better understanding of “public participation” on both sides of the border.

The question of cultural differences on either side of the border cannot be avoided. One paradoxical situation arose over a project put forward by a private organization. There was strong resistance to certifying a project presented by the private sector. The argument made was that the BECC handled public funds and therefore should not benefit the private sector.

In that case, the main criterion for the decision was that the private-sector organization presenting the project, as well as contributing to the resolution of a public environmental problem, must agree to contribute either financially or in kind to resolve an environmental problem in the community where the project is located. The BECC approved the project in order to set a precedent, to let it be known that it would continue to approve appropriate projects presented by the business community. This exem-

plifies the “new experiment in decision-making”. The BECC has introduced mechanisms for democratic decision-making in a new process, and in an area where everyone has a different style and process in making decisions about public works. This not only represents a learning process, but also sets common norms that are established for the first time and that offer decision-making practices in undertakings of public works for which there are no precedents.

THE INTERNATIONAL JOINT COMMISSION (IJC)

Alice Chamberlain

US Commissioner

International Joint Commission (IJC)

The IJC was established by the Boundary Waters Treaty between Canada and the United States that dates back to 1909.

The principal function of the IJC is to regulate the use and diversion of the boundary waters under the Treaty. Secondly, the IJC seeks to help the two countries prevent disputes along the boundary. In these areas, it receives its work by reference from the Parties to the Treaty and proceeds from these to develop recommendations.

The two key principals that have been the foundation of the IJC and the key to its historical success are joint fact-finding and the development of consensus around issues.

Joint fact-finding has been critical. The work upon which the IJC bases its recommendations draws on individuals with expertise from industry, academia, the private sector and government. This is one reason that the governments so frequently accept the IJC’s recommendations and implement them.



The IJC is composed of three US commissioners and three Canadian commissioners. The IJC is required to work on a consensus basis whereby all six must agree to a recommendation.

Historically, there have only been two serious issues where consensus was not reached. This success in reaching consensus is an important reason why the Commission has endured over time. The institution is not directed by one person but rather by a consensus of six, based on joint fact-finding.

The most significant reference that the governments have ever given to the IJC is certainly its role in the Great Lakes Water Quality Agreement. The IJC was directed to monitor the progress that the governments are making in the implementation of that agreement. This has been a significant challenge for the IJC: government and industry tend to think the

Commission says too much, while the non-profit organizations that are so fundamental to the work in the Great Lakes tend to think that the Commission says too little. Although it is a difficult role to balance, the IJC's work under the Great Lakes Water Quality Agreement is now about 50 to 60 percent of its total workload.

The IJC has also monitored the Parties' progress under the Agreement. The increasingly complex environmental impacts in the Great Lakes are ones that historically have been much broader than the basin of the lakes themselves. They come from the entire continent. Therefore, work that has begun here with the CEC and other continental, trilateral organizations is critical to the success of the role of the IJC and, more importantly, to the success of the implementation of the Great Lakes Water Quality Agreement.



Chapter 2: Project Overview and NAFTA's Rule Changes and Institutions

PROJECT OVERVIEW

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NAFTA Effects Project Team Leader

Over the past five months, in an effort to define a research agenda for building a framework to assess NAFTA's environmental effects, members of the NAFTA Effects Project Team have been sobered by the complexities and analytical challenges involved. It is clear that a broad array of expertise will be demanded to undertake this project. This workshop provides an opportunity for knowledgeable and interested individuals and groups to respond to the initial thinking on the NAFTA Effects Project. It further provides the CEC with the chance to seek direction as the study moves into its second phase.

In the second phase, emphasis should be placed on setting a focus and identifying priorities, not on broadening the wide research agenda that has been outlined in the background paper. In this way, the study can report preliminary results as soon as the framework and methodology allow.

In designing this framework, it was a given that the mandate did not include the totality of environmental change in the North American community in the post-NAFTA era. What is unique to this project is the environmental change created or sustained by NAFTA itself. Thus, it is necessary to have a clear and concrete understanding of the distinct dimensions and developments of the NAFTA regime. It is important to move forward from there, to examine both the direct environmental effects that can be traced, the indirect effects — the trade and investment changes that have been

brought forth by the NAFTA agreements — and, most formidably, the environmental consequences that have flowed from them.

At the very beginning of the process, the complexity of the task necessitated a survey of the many formal, econometric, computable, general-equilibrium and partial-equilibrium models that were prominent in the policy world as the NAFTA debate unfolded. A decision was made at an early stage not to proceed with such a model as the basic framework for this project. In reviewing the work, it was clear that there was very little that could meet the distinctive purposes of this project, which takes a very concrete set of legal agreements and a very concrete intergovernmental regime, and moves to trace the linkages between them.

Studies undertaken in the post-NAFTA period, focusing on the analysis of the observed results accomplished by NAFTA, were also reviewed. Generally, those studies were compatible with the style of thinking that has been adopted for this project. They began with the NAFTA provisions and traced, in the first instance, the trade and investment effects, and then proceeded to consider each of their environmental impacts, in turn. This approach provides the advantage that, as the design proceeded, work could be undertaken in tandem and even in cooperation with those mounting other studies. However, these existing studies remain quite partial. They are much stronger in identifying the economic effects than the direct environmental effects of NAFTA. They are focused very heavily on a few sectors, such as agriculture and autos. Above all, they are almost entirely produced in the United States. Thus, it was felt that this effort had to proceed on a somewhat broader basis.



This project began by establishing basic criteria. In the first instance, the approach had to be balanced in two senses: to provide for the identification of both the ecologically beneficial effects of NAFTA, and those areas where policy intervention and further effort is required. The intention is not to produce an overall index or score of the environmental effects of NAFTA, but to look more specifically at the array of impacts, so that beneficial processes could be supported and those areas where harmful effects exist could be identified and addressed.

A balanced approach also meant observing the concerns and the impacts in all three NAFTA countries. Significant differences exist in the size of the three parties and their economies, as well as the processes of integration between Canada and the United States pursuant to the Canada-US Free Trade Agreement (FTA). Thus, it is clear that in the short term, the overwhelming magnitude of the economic and environmental adjustments of NAFTA will be experienced by Mexico and along the US-Mexico border. But as time and integration proceed, impacts throughout the full North American region must be assessed.

As this project will ultimately produce a framework for ongoing assessment, this study is not designed to focus narrowly on the specific environmental provisions of NAFTA. Instead, it takes a broader perspective, to examine NAFTA's vast array of innovative economic rules and the environmental impacts that they will and can have. But it must also be recognized that the NAFTA regime contains some of the most innovative environmental provisions, among all the modern trade liberalization agreements. Identifying the impacts those provisions have had in practice represents a rich research agenda.

Next, the framework should be causal at an acceptable level of confidence. This requires an examination of the distinct features of NAFTA, relative to other processes of trade liberalization and relative to other trade-liberalization agreements in which the three NAFTA countries are involved. This will allow a tracing of the economic and environmental consequences that have uniquely and fairly directly flowed from NAFTA. This is perhaps the greatest challenge facing the study: not only to construct the framework, but to report results that will be accepted as sound by the various constituencies interested in this work.

Thus, the analysis must be as concrete as possible. It begins by looking at the aggregate flows in the three transborder relationships amongst the NAFTA countries, as well as the trade and the investment patterns in the post-NAFTA period. The study will now move very quickly to consider specific sectors and try to focus the analysis on those specific organizations that have been affected by NAFTA, and which are producing the bulk of the broad flows observed.

This suggests beginning with a particular focus on the corporate sector and those firms and plants that have altered their activities because of NAFTA. The study will then proceed outwards, to focus on the activities of the other government organizations and in the social sectors that are involved as a consequence of that activity.

Finally, the study must be policy-relevant and policy-oriented. The findings and the methodology that are used to construct it must meet the needs of the governments, the CEC and their multiple audiences.



Thus, the basic architecture of the model begins with the provisions that were uniquely brought to the North American community by the NAFTA regime, broadly defined. Secondly, it examines the immediate ecological impacts of that regime. But the major part of the document analyzes the trade and investment flows that have unfolded from those NAFTA changes. Finally, the model considers the ecological impacts these flows have had.

To make the critical linkages, the study will consider closely the processes of production, as well as the infrastructure of transportation and other capacity-building exercises that have arisen to mitigate the impact of increased production. It will then move to deal with new patterns of social organization and government policy.

From there the emphasis is to identify as concretely as possible the new pressures or stresses that NAFTA-induced production and resulting activity has introduced into the North American environment and how it has affected the stability thresholds and the overall state of the ambient environment.

In the second stage, the study will look more closely at high-impact geographic areas or communities in North America where concentrations of NAFTA-generated production activity have, in some cases, overwhelmed the environmental infrastructure and capacity, have catalyzed new patterns of transportation, and have provided particular stresses that have altered the ambient environment itself.

As the NAFTA regime itself is the essential starting point for this study, it is important to identify the major parameters and dimensions of that regime.

The framework takes into account the fact that NAFTA began to exert effects,

not simply from the moment of its formal coming into force on January 1, 1994, but as early as 1990, when the NAFTA debate in the three countries began. As a result, the analysis makes a broad distinction between the pre-NAFTA period of the 1980s, the period of NAFTA transition from 1990 through 1993, and the patterns observed both in 1994 (the year before the economic crisis in Mexico) and the changes observed in 1995 and onwards.

A second challenge is to distinguish what the NAFTA negotiating process and text brought that were unique to the Agreement and to separate that from ongoing trade-liberalization processes, most notably in the General Agreement on Tariffs and Trade (GATT). That analysis focuses on the particular parts of the NAFTA regime that are most consequential for subsequent economic and ecological activity.

A broad view of NAFTA requires a conception of that regime based on five central elements:

1. The NAFTA debate and the negotiations had an important impact on:
 - raising the consciousness of the corporate sector about opportunities throughout North America;
 - intensifying awareness of economic opportunities and ecological consciousness in the three NAFTA countries;
 - strengthening the role of environmental NGOs; and
 - moving NGOs and their governments beyond their national priority issues to build networks of trilateral cooperation.

These will be explored in the operation of the post-NAFTA period,



with a view to seeing how they might be strengthened.

2. The second dimension consists of the specific economic and environmental rule changes, in the NAFTA text itself and in the accompanying side agreements.
3. The third dimension consists of the dispute-settlement mechanisms of the NAFTA. The Agreement brought three sets of dispute-settlement mechanisms to North America, which will become important as the years proceed. Perhaps the most important, in the sense of being the most innovative, was the new process applied to all three of the NAFTA parties for investment dispute settlement. In the near term, this process will engage relatively little of this study's attention, as no cases have yet been processed under that mechanism. But it was one of the major new features of the regime. Also important was the dispute-settlement mechanisms for antidumping and countervailing cases. Many cases have been processed over the past two and a half years, but they involve few environmental sensitivities. The way in which corporate actors, in particular, react to that particular dispute settlement process is an item that could well warrant further research. There is also a dispute-settlement mechanism for general issues between the three countries. It may have broader significance as the study proceeds.
4. The fourth dimension is the new array of intergovernmental institutions created by the NAFTA. These include the three ministerial Commissions and the array of sixteen or so intergovernmental committees, subcommittees, and working groups which NAFTA established. Some of those have impor-

tant environmental subjects as a core part of their existing mandates. Others will begin to have environmental consequences as they take up their economic mandates. As well, there are other, bilateral intergovernmental institutions that the NAFTA in part inspired but that are also part of the capacity for dealing with some of the difficulties that may arise in the NAFTA's wake.

5. The final dimension consists of NAFTA's incentives for policy harmonization. NAFTA is not a static set of rules, but a dynamic, living regime. Increasingly, the impact of the initial NAFTA debate will have a diminishing effect as time passes, even the specific rule changes of the first of January 1994. Instead, the operation of the dispute settlement mechanisms, the NAFTA institutions in the coming few years, and the broader process of the deepening and broadening of the new, integrated North American community will have the greater long-term effects.

ECONOMIC RULE CHANGES AND INSTITUTIONS

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This project represents an immense challenge and involves undertaking two very difficult tasks. The first is to trace the impacts of NAFTA on the economies of Canada, the United States and Mexico and their inter-relationship; the second is to identify the effect of that economic activity on pollution in North America. The challenge is to put those two undertakings together. The framework which is being developed for



this study involves a flexible, eclectic process, incorporating a number of interviews, and which has chosen to bypass existing economic models. This process is the only one that is workable under the circumstances.

This session is on economic rules and institutions. In this regard, there are three substantive points that should be considered.

1. Why is it important to consider changes in rules when discussing the environment and NAFTA? One reason is that where these rule changes are substantive and lead to substantive changes in environmental regulations or policies and as a result changes in the location of industry or economic activity, they provide the first clues as to where there could be environmental effects. Thus, rule changes and institutions are important.

The discussion paper breaks the major rule changes into six areas: tariffs, investment, other rules (which include standards and phytosanitary standards), intellectual property, government procurement, and rules of origin. It also highlights three sectors: the automotive sector, the agricultural sector, and the energy-petrochemical sector. This method of categorizing rules and issues appears to highlight those chapters in NAFTA which are significant to the environmental context. Thus, in thinking of air, water, and soil degradation, one can consider the various rule changes and determine the sources of pollutants, greenhouse gases, and other emissions that such rule changes could trigger. The way in which the discussion paper has attempted to single out these rules and establish the first linkages between the NAFTA and the environment is

impressive. However, in tracing causality in the discussion paper, one must always be careful to state that causality is crucial. Most scientific studies, for example in medicine, are correlations; they are not causality. In many cases, linkages between morbidity, mortality and pollutants, in many cases, are very unscientific studies.

2. The discussion paper does not sufficiently discuss the crucial nature of new institutions. Although the NAFTA is not the European Union, there are a number of new institutions that have resulted from the NAFTA process, including the CEC. There has to be much more discussion about the importance of institutions and their future role in the NAFTA. Institutions do matter.

An Appendix to the discussion paper (not reproduced in this document) lists the various committees, subcommittees, and working groups in NAFTA. Although it is not clear what the difference is between the various sub-classifications, there are five committees, three working groups, and one advisory committee. Under the committees, there are seven kinds of institutions. Then there are committees under committees. There are working groups, subgroups, advisory committees, bilateral working groups, subcommittees, and councils. Clearly, the institutional context of NAFTA is complex, and it is not necessarily the CEC's role to undertake the study to clarify it. But there is certainly a need for a study of what the institutional framework of NAFTA actually is. Many of these committees do not see the light of day. It is not clear when they meet, what they discuss, there are no minutes and thus they are not transparent.



The institutional structure of NAFTA is important because, as was apparent in the discussion of the NADBank and the BECC, the ways in which an institution goes about gathering information and dealing with stakeholders, including governments, can have an enormous effect. Because of the 23 committees and subcommittees in NAFTA, it is crucial for somebody to undertake an analysis of what impact they may have.

3. In terms of the rules and institutions, a critical question is: where will this go? If NAFTA is not an economic union, then what is it? What are these institutions? What is the role of the Secretariat of the CEC? What will the information flows be? Where is North America heading? From an environmental perspective and the perspective of the CEC, institutions and rules are crucial to the process. Indeed, by nature, potentially they constitute the most important element of this study.

ENVIRONMENTAL RULE CHANGES AND INSTITUTIONS

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This issue is of extreme interest to the governments and to the many constituent communities of NAFTA that were part of this process going back to 1990, when the governments first began to talk seriously about NAFTA.

Discussing the environmental rule changes in NAFTA is a difficult assignment because it does not really contain any environmental rule changes, either in itself or in its side agreements. So what becomes significant is the context that

NAFTA provides for where the rule changes are occurring or may occur, and to focus as much on institutions and processes as on changes in the substantive rules. That is the critical contribution of NAFTA and the one that is likely to have the most influence in terms of its effect on the environment and environmental management in the three NAFTA countries, both individually and collectively.

The basic framework of the different dimensions of NAFTA includes the NAFTA debate as one aspect. It is important to keep in mind that that debate did not end in 1993 when the governments adopted the Agreement: it is a debate that continues. So it is the backdrop for the specific aspects of the implementation of NAFTA.

Referring to the NAFTA debate — both the pre-Agreement debate and the debate as it has continued — three fundamental categories of concern have arisen about the environmental implications or consequences of NAFTA.

1. A concern exists about the potential for the trade rules in the trade agreement itself to impose restraints on environmental protection measures taken by national or sub-national governments within the three countries.
2. The potential for the new economic relationship — the increased flows of trade and investment — to exert downward pressure on national policies by virtue of increased competition among the three countries is a concern.
3. The potential for adverse environmental effects arising from intensified economic activity is an issue. This was the primary motivation for entering the trade agreement in the first place.



This third concern has two key dimensions. The dimension that received the most attention, certainly in the United States, prior to the passage of the NAFTA implementing legislation, was the potential for immediate and localized consequences of intensified economic activity in the US-Mexico border area. But there is a larger concern about the direct environmental consequences of increased trade and investment that goes to a larger theme of this effort to evaluate NAFTA's environmental effects. That is, to what extent will the changing patterns of both investment and trade flows lead to increased pollution or changes in land use or other environmental harms which are already of significance within the three countries. And, how should these be managed?

At least two of the three concerns — and, in substantial part, all three of them — relate to national and sub-national policies and the interaction of NAFTA with them. That is useful to remember. Environmental rule changes at the national and sub-national levels will continue to be the dominant factors in determining the environmental effects of NAFTA and in shaping the policy responses to those environmental effects. Americans and Mexicans will appreciate that in the past two years, in the United States and Mexico at least, there have been active national discussions of changes to environmental rules, that is, legislative changes to fundamental environmental statutes. All of the affected interests — the business community, environmental activists, the political observers and commentators — have recognized that this is where the fundamental issues lie and that they are not simply an outgrowth of NAFTA. Indeed, in large part, they do not relate to NAFTA at all. Yet, the outcomes of

those national discussions and rule changes undoubtedly have important consequences for this study and will shape the way the environmental effects of NAFTA come about, and the way in which we respond to them.

In thinking about these environmental rule changes, it would be helpful to focus on the location of where those rules changes are likely to occur. Strictly speaking, the BECC and the NADBank are not part of NAFTA, but come from a separate agreement. Nevertheless, it would be unfortunate to think of them as outside the scope of this study. Both the agreement giving rise to the BECC and the NADBank, as well as the NAAEC, which established the CEC, have to be viewed as integral parts of the NAFTA regime. If these two agreements and their institutions had not been created, there would have been no NAFTA. It is also important to recognize that, but for the fact the governments were committed politically to the creation of NAFTA, they would not have created these other institutions. In other words, they are inextricably bound together.

With respect to the three categories of concerns, NAFTA itself primarily addresses the possible trade-related restraints on both national and sub-national environmental policies. The CEC is the centre of activity for dealing with issues arising out of the possible downward pressure on national policies that arise from increased commercial relations and the more open, competitive environment. The BECC and NADBank agreement specifically deals with at least one dimension of the concern about the direct environmental consequences of increased economic activity by addressing specifically environmental concerns in the US-Mexico border area.



Another critical aspect to examine with respect to the changes to environmental rules — separate from the substantive rules, where changes are made primarily at the national and sub-national levels — is the international institutions and procedures. The roles of the CEC, BECC and NADBank are essential to the consideration of changes to environmental rules in the context of NAFTA.

From the environmental activists' point of view, the important benefit of these agreements was to create opportunities for new procedures and new processes for making environmental decisions. In the one case, this was between the three countries; in the case of the BECC and the NADBank it involved the bilateral relationship between the United States and Mexico. In addition to a general commitment to higher levels of environmental protection and effective enforcement, these institutional arrangements provide specific procedures for public

participation and, in the context of the CEC, specific procedures for fact-finding and dispute resolution with respect to concerns about the lack of effective enforcement of environmental law, for example. As well, the CEC provides for public input through its Joint Public Advisory Committee (JPAC). These institutional aspects have the potential to be central contributions to the mitigation of environmental effects in the three countries.

Similarly, in the BECC agreement, public participation and the aspect of local control are central. The institutional changes set forth in the BECC and the NADBank are significant in bringing new ways of thinking and decision-making forward into bilateral environmental relations. They are potentially important environmental “effects”, which also suggest new and innovative ways of dealing with further effects.



Chapter 3: NAFTA's Trade and Investment Effects

INTRODUCTION

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Vice President, Institute of the Americas

One issue that the CEC should consider in designing this project is the issue of causality: how the trade and investment impacts of NAFTA can realistically be linked to the environment. In undertaking a project of this scope, it is very important to consider: first, whether it will be possible to establish causality; second, whether it is necessary to establish causality; and third, whether it is desirable to establish causality. In light of the methodological problems, the policy and time frameworks, and the tendency for NAFTA effects to be overwhelmed by any number of other effects in the trilateral relationship (including currency effects), perhaps this study should focus on issues that, at least on their face are possible to undertake.

Thus, in approaching this study, the CEC might consider addressing some of the specific environmental problems facing the three NAFTA countries. In addition, the CEC could identify what the institutions created in response to these issues are doing to solve the problems.

One option would be to focus specifically on the institutions established by the NAFTA, and the process that surrounded its negotiation, and on what these institutions specifically can do to deal with the environmental problems that the three countries face. This analysis could be undertaken independent of whether or not NAFTA had anything to do with causing the environmental problems. A second set of issues that one could focus on are more sector-specific, where it is assumed that there is causality, or at least enough of a correlation, so

that it makes sense to focus on those sectors. From a policy perspective, those are the sectors that are of most importance to the three NAFTA economies. They could be identified as those that are: 1) very significant economically and 2) are seen to have important environmental impacts.

A third option would be to recognize the fact that NAFTA is having its most important impacts in Mexico, both in terms of environment and economy. The study could focus on addressing the question of the long-term impact of closer relationships between Mexico and the United States and Canada on Mexican environmental policy and enforcement. There is a very complex process of interaction between NAFTA and the host of other issues that will be embraced by this study, and the methodology will have to accommodate these complexities.

NAFTA'S TRADE EFFECTS

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There are many examples of policy changes that can be shown to have affected trade. For example, the successive rounds of trade negotiations in the GATT had an impact on trade flows. In US-Canada relations, the 1965 Automobile Pact led to a tremendous change in the way production trade took place in the automotive sector between Canada and the United States. And following the first three years of operation of the FTA, a study was conducted in Canada which showed that Canada's exports increased most dramatically in the non-resource, manufactured items that were liberalized by the FTA. While it may be difficult to



prove causation, there is certainly correlation between the FTA and the specific increases in exports. When considered on a case-by-case basis, it is likely that many changes in trade flows can be traced back to their respective trading regimes through a mixture of causation and correlation.

In 1995, the decline in Mexican imports from the United States was about 8.5 percent.⁵ The decline in Mexican imports from Europe and Japan was about 25 percent over the same period and, given the preferences and the other arrangements that exist within the NAFTA, it is likely that one could show causation. Finding causation in the environmental-trade area is complex. In some cases, one can find it and in others one cannot, but there must be limits as to what will be studied. There are other studies that look at broad environmental flows. Without some link to NAFTA, this study may well be impossible to complete and it would not take two years: it would take 10 or 15 years.

Prior to discussing specific trade data, there are some important points to make about NAFTA and about integration.

Non-economists tend to think that integration is useful for countries that are complementary in their production processes, and that when countries have similar production outputs integration does not lead to significant progress. Economists, on the other hand, tend to think the reverse — that formal integration is not necessary if the production processes are complementary. For example, if Mexico ships oil to the United States, an integration agreement is not

necessary because Mexico will ship the oil anyway, because the duties are low.

As has been seen in Europe, in US-Canada integration, and now in Mexico's integration into North America, the important benefits of integration arrangements occur in intra-industry trade, as specialization develops *within* industries. It also occurs within firms or between affiliates of the same firms. It is no accident that by far the biggest item of trade between the three NAFTA countries is in the automotive sector where trade occurs within the same sector and often within the same firm.

Second, there has been some discussion here about what NAFTA deals with. However, there are a number of things that NAFTA does not deal with. NAFTA, in fact, does not deal with the most important economic decisions happening in the three countries — their macroeconomic policies. Had the NAFTA negotiators attempted to deal with those issues, as they have in the European Union, NAFTA would not have been approved in any of the three countries. At the time, none of them were ready for that degree of integration. NAFTA does not deal with exchange rates, fiscal policy or monetary policy. As a result of what happened in Mexico in 1995, there will be more extensive consultation on these issues in the future. But it is difficult to include issues such as these in a trade agreement unless parties are prepared to go further in their integration than are the countries of North America.

The problems that Mexico experienced in 1994 had to do with issues of exchange rate and monetary policy that were not



⁵ Using Mexican data.

part of NAFTA. Nevertheless, these non-NAFTA issues clearly affect NAFTA profoundly. Since the end of 1994, the Mexican peso has depreciated by more than 50 percent, while Mexican tariffs are gradually being reduced from an average of only 12 percent. Clearly the depreciation of 50 percent will have a greater impact on trade than tariff reduction. Trade is more dependent on the overall state, size, and rate of growth of economies than it is on border barriers. For example, American exports in 1994 were worth about US \$4,200 for each Canadian and US \$560 for each Mexican, per capita. The difference has to do with differences in per capita incomes in the two countries.

These points, which are evident to economists and to many others, should be kept in mind. The existence of a trade integration or an investment integration arrangement is not going to correct for faulty macroeconomic policy in any of the three NAFTA countries. Integration arrangements assume that policy will be effective in these other areas as well. At the heart of the matter in each country is domestic macroeconomic policy, and to the extent that this stimulates economic growth, NAFTA can augment this growth.

Thus, while NAFTA did not cause the breakdown that occurred in Mexico (although it contributed to raising optimism about Mexico in the investing and in the trading world), NAFTA had a tremendous influence on the reaction to the breakdown, in both Mexico and the United States.

The social consequences in Mexico have been quite severe. Mexico has just gone through possibly the worst year in its economy since the Revolution. This affects the entire society. However, Mexico is also recovering from this catastrophe

more quickly than from the debt crisis after 1982. In reacting to the crisis of 1982, Mexico automatically put in place import controls, as well as capital controls. Mexico is still paying for the capital controls imposed in 1982 because the distrust of the outside world toward a Mexican promise still lingers to this day. In 1995 Mexico used macroeconomic policy to deal with its adjustment process. This is the first time in recent memory where Mexico has not used trade measures, and it is quite probable that trade restrictions would have been imposed had NAFTA not been in existence. The United States provided US \$20 billion of credit and was influential in obtaining an International Monetary Fund (IMF) credit of US \$18 billion and the promise of credit by other central banks. Credit of that magnitude would probably not have been forthcoming without NAFTA.

With respect to trade generally, growth in trade between Mexico and the United States has been dramatic. It is unclear how much of this growth is caused by NAFTA directly, although there has certainly been some effect. Mexican exports to the United States were US \$19 billion in 1985, US \$29 billion in 1990, US \$49 billion in 1994, and they continued to grow in 1995, in part because of the peso, but also because of increased demand. Both Canadian and American exports have also grown.

In 1994, not quite half of Mexico's exports to the United States originated in the *maquiladoras* at the border. The trade data, sector by sector, indicate that the nature of the growth has been in intra-firm and intra-industry trade. In Canada, over 70 percent of manufactured exports to the United States are intra-firm or between related parties. The Mexican figure is not quite at that level but is growing.



In 1995, Mexican imports declined and exports increased. The turnaround in Mexican trade between 1994 and 1995 was quite immense — US \$25 billion, out of total trade of roughly US \$100 billion. But in part because of the NAFTA and in part because of the reliance on the American market, Mexico's imports of intermediate products actually increased in 1995. Capital goods imports, related to export industries, increased. Consumer goods plummeted, even though they had been high before. Canada's exports to Mexico actually increased in 1995.

NAFTA deals with services and with other important areas as well. Some can be nonpolluting, some can be polluting. Significant changes are taking place throughout the Mexican economy. Mexico is currently upgrading its railroad system. Its telecommunications sector is opening. Natural gas pipeline ownership is being opened to foreign investors. These probably would not have happened at this time without NAFTA.

The *maquiladoras* deserve a separate focus. The *maquiladora* industry relates to transnational plants which import inputs from outside Mexico, primarily from the United States, process them, and then ship the goods back to the United States paying duty only on the value added outside the United States. The process of *maquiladora* operations will disappear as a result of NAFTA because the duty on shipments back to the United States will go to zero, which is even better treatment than paying duty on the value-added in Mexico.

Nevertheless, the *maquiladora* plants may not move because the border is a convenient location. Much of the environmental concern that existed during the debate on the negotiation and approval of NAFTA had to do with pollution at

the border, due to several factors. These included the way the *maquiladoras* had been run, the increase in population at the border, and the fragile nature of the border resources. These issues still exist.

The next step is to relate the trade increases that can likely be traced to NAFTA and look carefully at those industries affected to determine whether they have a propensity to pollute. The analysis in very general terms leads to mixed conclusions. The most important sector, automotive production, ranks relatively low in toxic intensity, at least using American data. Machinery and equipment production, which has grown tremendously, is in the mid-range of toxic potential. Pulp, paperboard, plastic products, furniture — all of which have grown — rank high in toxic intensity. These are the kinds of issues which must be considered. In terms of the growth of trade in services, some services rank high in the toxic intensity and some rank low. For example, trucking probably ranks very high (although techniques may change) and the growth of financial services and telecommunication services would rank low. In other words, careful distinctions must be made among the various kinds of trade that takes place.

The most significant trading entities from all three countries are the large multinational corporations which are responsible for most of the increases in trade in North America. Interviews have shown that the standards of these big corporations on environment, machinery, and operations tend to be applied globally. They do not break their activities down by country but try to develop uniform standards for their world-wide operations. Thus, growth in multinational investment in North America will not necessarily lead to higher levels of environmental degradation.



In their investment decisions related to NAFTA so far, US corporations claim not to have been critically affected by environmental concerns; interviews conducted to date bear this out. In the future, it would be useful to consider this issue through further interviews with corporations, trade unions and other actors involved. This would allow for an examination of the trade and environmental data, and link that material with specific industries and particular sectors to determine whether what the corporations are saying is consistent.

NAFTA'S INVESTMENT EFFECTS

Rogelio Ramírez de la O.

President

Ecanal, S.A. de C.V.

In considering the relationship between NAFTA and investment one has to be careful in dealing with the origin of the investment, where the investment decision is based, and to what extent the existence of NAFTA affects the investment decision. In order to do this, an analysis of investment under NAFTA must be based both on macro and micro considerations.

Macro economic analysis might show a weak or a strong confirmation of the relationship that is presumed to exist, but one must also look at the micro picture. A micro perspective tends to amplify the knowledge derived from the macro perspective. It is important to make a distinction because one would expect that the macro analysis will not allow a sufficient determination of causation. It is critical that the micro picture makes sense in the context of broader

economic analysis. Making sense is more important than establishing scientific causation which, in general, in economics, is very difficult to establish.

From a macro perspective, it is clear that in the years leading up to NAFTA — from 1987 to 1990 (the post-NAFTA period is distinguished as being from 1991 onwards, when investment decisions were taken by firms with the view that NAFTA was a *fait accompli*) American direct investment in Mexico jumped on average from US \$0.8 billion per year to US \$1.8 billion per year. Mexican direct foreign investment in the United States went from between zero to \$50 million per year, to \$400 million per year.⁶ Post-NAFTA investments were motivated by the prospects that NAFTA opened up in terms of opportunities and in terms of encouraging investors' prospects for business on increasing the scale of production and sales.

In Canada the situation was somewhat different because NAFTA was preceded by the FTA. Much of the direct investment between the two countries took place before NAFTA, in 1988 and 1989. Nonetheless, there was also an increase in cross direct investment between Canada and the United States in the years leading up to, and immediately following, the passage of NAFTA. It is not necessary to determine exactly what percentage of this investment can be attributed to NAFTA. What is important is that NAFTA as a cause makes sense.

The increased direct investment in North America is concentrated in the manufacturing industry where there are industries that span the three countries,

⁶ This is based on US Department of Commerce figures, which systematically underestimate levels of investment because they are based on historical cost accounting.



such as processed food, textiles, and machinery and equipment. In the latter category, there are two major industries: the automotive industry and the high-tech engineering industry, which includes anything from office equipment to electronics, photographic equipment and more.

After the manufacturing sector, the second area of concentration is in distribution and trade. This makes sense because of the modernization process the NAFTA forces on both wholesale and retail distribution systems. The third area of concentration is in services, which includes restaurants, hotels and financial services.

Because of the much smaller relative size of Mexico's economy compared to Canada and the United States, and the fact that Mexico was coming out of a period of recession in the 1980s when there was very little investment, the greatest incremental effect of NAFTA on North American investment was felt in Mexico. Mexico had the biggest potential for productivity growth, and it was the country where the greatest impact was felt by widening the production frontiers and provoking changes in technological processes.

The greatest investment effect has been led by two main agents. One is the multinational corporation, which is already well-represented in trade flows. But there has also been an indirect effect through non-multinational corporations. The indirect effect has probably been much greater than the direct one, or it is becoming much greater. Between 1991 and 1994, flows of direct foreign investment into Mexico grew by US \$21 billion, but indirect foreign investment into Mexico grew by US \$63 billion. The indirect foreign investment has been carried out in a large part by Mexican firms which, as a result of NAFTA (or

processes very closely associated with NAFTA), gained access to the international capital market. The bulk of this indirect investment (debt, bond issues, equity issues, and other financial instruments) is concentrated in telecommunications, construction, industrial materials (including chemicals, synthetic fibres, minerals, and processing of products), retail distribution, holding companies and services.

NAFTA has had, and will continue to have, four major impacts which encourage investment.

1. It preserves the specialization gains, mainly for North American producers, through the well-known rules of origin, which tend to favour North American producers over non-North American producers.
2. NAFTA allows Mexico greater access to the American market in products that have traditionally faced trade barriers, such as cement, steel and other industrial materials.
3. NAFTA creates opportunities for joint ventures, particularly for the production of industrial materials, including the chemical industry, which have led to an improvement in technological processes.
4. NAFTA facilitates the penetration of brands from one country to another through the national treatment clause, intellectual property protection and the homogenization of standards.

How are investors responding to the effects that the NAFTA has had on the investment climate in North America? One investor, the multinational corporation, is focused mainly on two areas:



- the area where trade is very intense, in exports and imports, mainly in the engineering industries; and
- the area where there is not much trade but there is a focus on the development of the domestic market and the penetration of brands.

A second investor is in the Mexican firm that seeks to expand capacity in order to consolidate its export base. Such exports consist generally of standard materials, undifferentiated products or bulk products.

PERSPECTIVES

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I will first provide some general comments on the NAFTA trade effects during the first two years and then some specific comments on the discussion paper.

There have been some fairly dramatic changes in the trilateral trade patterns since the NAFTA went into effect, which provide an overall framework for more specific comments. In 1994, there were record levels of trade in North America. US trade with Mexico was at a US \$1.3 billion surplus in 1994. The United States also had record levels of trade with Canada in 1994. Much of the increased trade was due to the elimination of tariff barriers as a result of NAFTA.

Figure 3.1 illustrates some of the specific tariff reductions that went into effect in 1994. It shows some of the specific categories of the US Harmonized System (HS) tariff schedule and illustrates some

of the dramatic changes. For example, instant print film was subject to a tariff rate of 15 percent prior to the NAFTA. When the rate dropped to zero in the first year that the Agreement went into effect, the volume of trade in print film increased by over 2,000 percent. So NAFTA had a dramatic impact in that first year.

In the second year that NAFTA was in effect, there were also major changes in the trade patterns, largely due to the Mexican peso devaluation. For example, major drops occurred in US exports to Mexico. However, there was an increase in US exports to Mexico in the beginning of 1996. The changes in trade flows in 1995 were primarily the result of the peso devaluation and currency fluctuations; US exports dropped by 9 percent and imports increased by about 25 percent. Even though US exports to Mexico dropped in 1995, they were still higher than in 1993, before NAFTA went into effect, by approximately \$5 billion.

Figure 3.2 illustrates US merchandise trade with Canada for 1993 and 1994, the years immediately prior to, and following, the passage of the NAFTA. It indicates that the volume of merchandise trade increased.

Changes have also occurred in some of the major sectors. From the first quarters of both 1994 and 1995, these changes are largely the result of the devaluation of the peso. In specific sectors, the impacts were different. For instance, in consumer goods, trade with Mexico dropped dramatically. There were also major drops in the capital goods sector. In the intermediate goods sector, however, American trade with Mexico increased, primarily because these goods often constituted inputs for use in export sectors that were booming in Mexico.



Figure 3.1
Duty Free Exports to Mexico in NAFTA's First Year
(\$ '000)

American Export Category — HS 6-digit	Total Export 1993	Total Export 1994	\$ Change	Percentage Change	Tariff Before NAFTA (in percent)
Digital monolithic integrated circuits	211,665	492,264	280,599	133	10
Cathode-Ray tv picture tubes, color include monitor	359,588	472,542	112,954	31	15
Electronic integrated circuits and mcrssmbles nesoi	84,002	372,476	288,474	343	10
Cathode ray tubes, nesoi	6,821	156,442	149,621	2,194	10-15
Recorder media for sound including master prod rcd	77,238	122,157	44,919	58	10-15
Hot or combination hot and cold roll mill exc tube	277	42,899	42,622	15,387	10
Diesel electric locomotives	4,904	40,783	35,879	732	10
Bulldozers and angeldozers	21,507	33,825	12,318	57	15
Microwave ovens	11,536	21,428	9,892	86	20
Signal glassware & glass optics	1,540	17,814	16,274	1,057	10-20
Radio broadcast receivers	6,712	16,289	9,577	143	20
Washing and bleaching machines	3,293	15,327	12,034	365	10-20
Micrometers and guages	4,042	13,469	9,427	233	20
Prts and access of apprt & equip for photo and cinema	3,705	13,385	9,680	261	15
Moving, grading machines	2,540	11,938	9,398	370	20
Photocopying apparatus	2,937	7,871	4,934	168	20
Toothbrushes	3,318	7,541	4,223	127	10
Converters used in metallurgy	30	7,285	7,255	24,183	10
Instant print film	236	6,960	6,724	2,849	15
Equipment for photography including cinema	1,847	6,542	4,695	254	10-20
Woven colton fabric	22	6,448	6,426	29,209	15
Fresh strawberries	1,722	6,248	4,526	263	20
Ice and roller skates	577	5,934	5,357	928	20
Refrigeration and freezing equipment	2,402	5,192	2,790	116	15
Poultry-keeping machinery	7,937	16,697	8,760	110	15
Parts for metal rolling mills	6,771	17,646	10,875	161	10
Other Duty Free	8,994,550	11,369,316	2,374,766	26	6

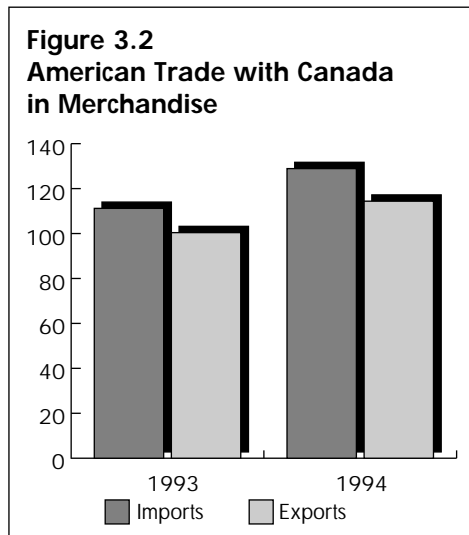
Source: US Bureau of Census.

I have five specific comments relating to the discussion document.

1. The economic factors that one has to take into account when looking at the first two years of NAFTA agreement are extremely complex. During the first year that NAFTA was in effect, and based on some of the tariff reductions, there were some dramatic increases in trade movement from the

United States to Mexico. Similarly, in those same categories in 1995, there were significant decreases. The devaluation of the peso has disrupted the trade patterns. The bilateral trade agreement has been in effect in Canada and the United States for a longer time period. Therefore, it is easier to establish trade trends and take into account some of the fluctuations that have occurred in the

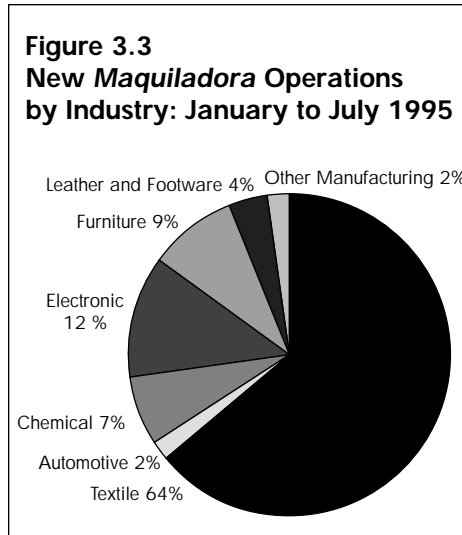




exchange rates since the FTA was implemented in 1989.

- The second comment is on the point of causality, and specifically the tariff effects that might occur in targetted sectors, specifically in autos and automotive parts. There has been a great deal of discussion about these sectors. Some dramatic increases in trade in autos and auto parts have occurred, particularly from Mexico to the United States.

By looking at the trade patterns, is it possible to determine what might be causing this? First, most of the tariff rates on auto parts coming into the United States were zero and they entered the United States duty free, even before NAFTA. Autos generally were also subject to low tariffs of 2.5 percent prior to NAFTA. So it does not appear that tariffs were a major issue in influencing trade patterns in that sector. Was it simply increased demand? Part of the reason might be that there is some import substitution occurring, and that some of these products that were coming from other parts of the world are now coming from Mexico instead. Thus,



the potential for import substitution is another factor that must be taken into account. Certainly the peso devaluation is another factor that caused the increase in Mexican exports. But all manner of factors such as these must be taken into account when determining why there might have been growth in a particular sector.

- The third point deals with the *maquiladora* area. The discussion paper considers *maquilas* to some extent, but it needs to take into account some trends that have been

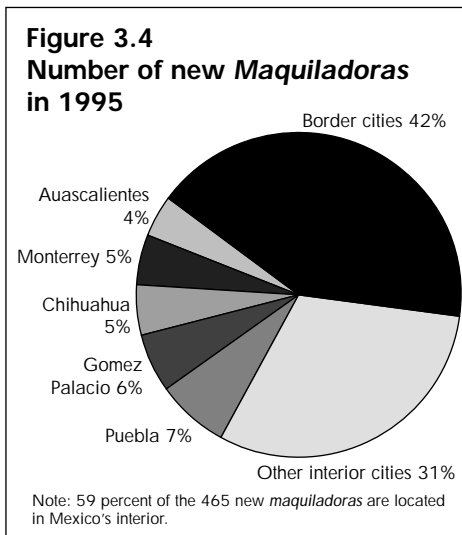
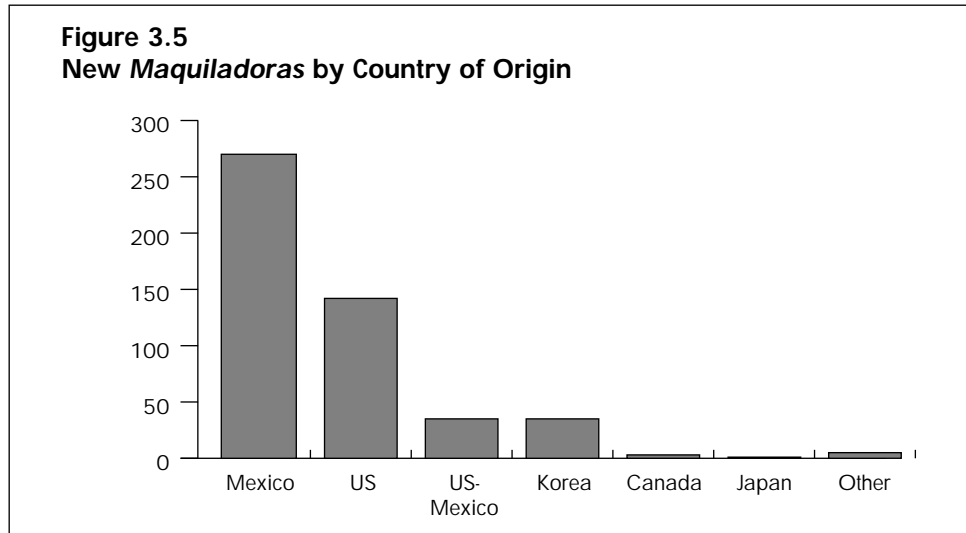


Figure 3.5
New Maquiladoras by Country of Origin



occurring since 1995. One important point is that in 1995, 465 new *maquiladoras* went into operation. Figure 3.3 illustrates a breakdown of these new *maquiladoras* by industry. Figure 3.4 illustrates a breakdown of the new *maquiladoras* by geographic location. It is significant that 59 percent of these new operations were not located along the Mexico-US border, but rather in the interior of Mexico. Certainly that is what NAFTA was intended to do. If the trend continues, it will reduce the level of environmental problems focusing on the border.

Another trend that is becoming apparent with respect to the *maquiladoras* is the gradual expansion of the sale of products and services within the domestic Mexican market. Figure 3.5 illustrates the national origin of the *maquiladoras* established in 1995. It is also important that since 1995 the proportion of sales of goods produced in the *maquiladoras* for Mexican consumption has increased, while less has been shipped back to the United States. This could result in less congestion at the border and might be an interesting impact for this study. There is also a trend (again, beginning in

1995) towards increasing *maquiladora* exports to Europe and Latin America.

4. The discussion paper needs to focus on the privatization efforts that are occurring in Mexico and what the ramifications of these efforts might be on trade flows and the environment. For example, railroads are going to be privatized and this may well have implications for truck traffic. At present, approximately 80 percent of trade crosses the border on trucks. The environmental impacts of privatization and the effect on modes of transportation could thus be a significant issue to consider. Indeed, there will be a number of sectors that are going to be privatized over the next several years and their impacts on the environment could be dramatic.
5. Finally, the discussion paper does not focus on the US-Mexico border area, which is a critical area that needs to be examined. There needs to be more focus on the BECC and the NADBank and other institutions along the border and some consideration of what the off-shoots of the communication between the United States and Mexico in the area of border co-



operation are. There is a great deal of increased communication and increased efforts to establish trans-border entities to focus on some of the common issues on the border. This is an indirect outgrowth of NAFTA and the study should include a focus on the specifics of some of the results of this increased communications.⁷

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Trade between Canada and the United States has expanded greatly since the 1989 FTA. At present, 83 percent of Canadian exports go to the US, up from 77 percent in the mid-to-late 1980s. Studies by Canada's CD Howe Institute indicate also that trade patterns have changed, not only over-all trade patterns, but in the sectors that were liberalized by the FTA.

In order to test causality, one should consider whether trade agreements are endogenous. If exports boom between Canada and the United States in those areas that were liberalized, perhaps there were pressures to liberalize and exports were already increasing rapidly before the Agreement. This hypothesis turns out to be false. The exports from Canada to the United States and conversely from the United States to Canada which have expanded greatly since the FTA are in those sectors which were growing slowly in terms of trade before the FTA. This indicates, without using a complex econometric model, that there is causality.

In terms of the format, this study may be biased towards tending to find environmental degradation by looking at manufacturing sectors. It seems that in the automotive or transportation sectors, the main effect on the environment is not in the production of cars, but in the emissions from cars. NAFTA will result in rationalized production across the three NAFTA countries, just as the Canada-US Auto Pact of 1965 did between Canada and the United States. Therefore, cars will no longer be produced in Mexico just for the Mexican market and cars that are produced in Canada are produced for the Los Angeles market, even though the Clean Air Act of Los Angeles does not exist in Alberta. However, it may not pay these manufacturers to produce cars with varying engines and varying environmental controls. Therefore, the strongest impact on Mexico in the automotive sector could be in the production of cars that meet North American standards, and this will mean that they are much cleaner.

Finally, by choosing a sector to study that has incurred the largest change in trade flows or the largest investment, only one of two criteria is met. The other criterion to be considered is its impact on the environment. Thus, oil refining and petrochemicals would seem to be one of the logical sectors to be studied first, rather than transportation equipment, unless transportation equipment includes emissions, because the production of automobiles is not a major source of pollutants.

⁷ For example, in the Imperial Valley there have been discussions between US and Mexican government and private sector officials on the New River. The Department of Commerce is working with the local communities to set up a task force between the Mexico and the United States to clean up the New River. In El Paso-Juárez, air quality management is another area where a lot of work has been done.



Adalberto García Rocha

The College of Mexico

Environmental discussions are often biased either for ideological reasons or by virtue of the simple moral perception that defending the environment is good. But the real question is: at what cost? How can the cost be minimized or made equitable? The problem is that there is an implicit premise that trade liberalization might be harmful or might have undesirable impacts on the environment.

At the core of this concern is that trade results in economic growth, and that economic growth has negative effects upon the environment. The correct concern should be: does economic growth in general have an undesirable effect on the environment? The work in this field attempts to find favourable and unfavourable effects on the environment with no answer as to whether in balancing the two forces, the economy or the environment will prevail.

The general approach to the concern about the relationship between trade and the environment is wrong. This is illustrated by observing what has happened in Eastern and Central Europe where very closed economies have been the subjects of complete environmental devastation. So the question should be: What are the impacts of trade barriers on the environment? Good historical evidence exists to answer this question, or at least to begin to answer it.

A second problem is that economic theory does not have the capacity to reach the level of detail that is required for a discussion of these issues. There are a number of questions and ambiguities in this discussion, many of them related to the issue of causation.

1. The first is about the elimination of trade barriers as a means to encourage economic activity. The ambiguity lies in assuming that the elimination of trade barriers, such as certain types of subsidies (which is essentially what trade barriers are), have undesirable and important environmental consequences, as opposed to any other policy designed to promote economic growth. It is also very difficult to distinguish investment flowing from NAFTA from investment that is not associated with it, and then to determine whether there is a difference between the impacts of these different types of investment. Investment is growing in many parts of the Latin America and the world. How is NAFTA-induced investment different from this? The problem lies not in the answer, but in the question.
2. A second question is that even if there was a clear means of distinguishing between investment associated to trade liberalization and investment that is not related to NAFTA, it is not clear that the environmental effects are different, or that the environmental effects are international in nature. That is, environmental policies to correct for undesirable trade effects should not necessarily be discussed in an international setting. The use of trade barriers as a means to counter undesirable environmental effects should be considered even less.
3. A third question is whether environmental effects of trade, as opposed to other environmental effects, require different policies. Should policies for environmental problems derived from trade exist and be different from environmental policies for those effects that are not derived from trade?

NAFTA was implemented in 1994 but trade liberalization in Mexico started in



1985, nine years earlier. So what is unique about the environmental effects of NAFTA on their own? International co-operation on a number of issues, including the environment, is a good idea. But what is the purpose of discussing the environment in an international setting in the specific context of trade liberalization? Why not simply encourage broader environmental co-operation that is not necessarily related to international trade or investment? Removing the constraints implied by linking the environment to trade would improve the discussion internationally.

For example, NAFTA is a treaty on trade and investment. One of its most important components are the rules of origin. One issue raised from the rules of origin is: why not consider whether the rules of origin have a bias in favour of North America and against the rest of the world? Does that have an environmental dimension? Would it make sense to suggest the elimination of trade barriers with non-NAFTA countries, because they have some particular environ-

mental advantage and, therefore, proceed to remove rules of origin as barriers to the rest of the world?

The study of environmental problems and policies should not be the focus of trading partners. Rather, countries should engage in broader discussions concerning the connections between economic growth and the environment in general. This would produce a much richer discussion. The implication that trade barriers or barriers to investment are the right instrument to use to face environmental problems should be dismissed. That is the implication that comes from having a side agreement on the environment negotiated and implemented with a trade agreement. It is better to focus efforts on studying environmental problems in terms of their absolute importance for each of the three NAFTA countries. Increased pollution, toxic waste and environmental problems derived from economic activity should be very clearly distinguished from other ecological issues.





Chapter 4: NAFTA's Environmental Dimensions

INTRODUCTION

Richard Kamp

Director, Border Ecology Project

The economic discussions surrounding NAFTA often relate to issues of natural resource exploitation in northern Mexico, the American side of the border and elsewhere. In undertaking this study on the effects of NAFTA on the environment, a decision was made to consider NAFTA in terms of different regimes beginning in 1990. One of these dimensions, referred to in the discussion document as “the NAFTA debate”, essentially covers the period between 1990 and 1992 when there was a widespread neo-liberal policy of “opening up”, particularly in Mexico. In the summer of 1995, the Border Ecology Project, in conjunction with Mexican collaborators, undertook a study examining four different examples of mining in the state of Sonora in Mexico to examine the effects of some of these policies of “opening up”.

Although the mining sector is not a part of NAFTA, it certainly was a part of “the NAFTA debate”. Between 1990 and 1992, a number of reforms were implemented in Mexico similar to those which had occurred in the United States in 1872, when the Mining Law was passed. In the case of Mexico, there were two major issues. One was the agrarian reforms under Article 27 of the Constitution that affected the transfer of lands. The second was the development of a Mexican mining law between 1989 and 1992. This new law essentially forces landowners to prove that a mining company does not have a right to mine their land. Its passage was part of a concerted effort by Mexico aimed at the World Bank to secure increased investment in the mining sector.

So the question that we asked was: what will we find if we go to Mexico and look at four separate cases of exploration? How can they be linked with social and environmental impacts?

Although mining is not a part of NAFTA in terms of a strict reading of the document, this activity involves large-scale natural resource exploitation attached to policies that certainly were part of what is referred to in the discussion document as “the NAFTA debate”, which encompasses the negotiations and the policy shifts.

In examining these social and environmental effects, we found there were profound questions — most of them national questions — involved with policies that had to do with how people were being affected as land purchases were being made. In some cases, as much as fifty-five square miles was purchased for US \$100,000. In other cases, a mining company offering US \$2 million would move a village that included indigenous people who were not classified by the National Indigenous Institute as indigenous, because they had lost their identity.

Some of the mining companies had interesting and relatively forward-looking ideas on how to work with the community; others did not. Nobody in government seemed to have any consistent idea how to address these issues. Questions remained unanswered, such as: who was in charge of mining? Which secretariat? Which agency? What information did people have available? And, if they did have it available, how could they access it? How could they use it? How could they influence what was going on? How were they affected? How do people behave on the ground?



This project was essentially an advanced form of investigative journalism and this is important to keep in mind when looking at indicators. When we were done, we had four different pictures that constituted a start to the examination of four different elements of a sector that is not part of NAFTA. Yet, looking at the five stages of NAFTA that are described in the discussion paper, the sector actually is included. These issues, derived from the mining sector, are part of the first stage of NAFTA; that is, those actions that took place and those policies that were implemented prior to NAFTA, in conjunction with the attempt to ensure that the negotiations went ahead. These comprise “the NAFTA debate” issues that are not, strictly speaking, part of NAFTA, and they will have an enormous effect for many years to come, just as the Mining Law of 1872 has affected the use of public lands in the United States.

There have been many other debates surrounding NAFTA, such as that over whether the politics and policies inspired by NAFTA were directly linked to the decline of the peso or not. But in trying to look at environmental indicators, it is important to keep in mind that in the end, you have to go out into the field and look. It is never as black and white as it might seem, it is always a lot stranger.

FRAMEWORK, VARIABLES AND INDICATORS

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The relationship between economic activity and the environment is complex and demands careful examination. Its complexity is derived largely from the fact that it concerns intrinsic properties

of ecosystems, and the United States, Canada and Mexico have very different ecosystems. Given the differences in their properties, the impacts of a particular activity will differ between regions of Mexico, Canada and the United States. The three NAFTA countries also have other important and wide-ranging differences in their production processes, infrastructure and technology, as well as in their social organization and government policies. When examining environmental effects, it is necessary to include specific effects on ecosystem stability and their stability thresholds. Thus, one must focus on specific variables, such as climate, soils, nutrient cycles, amount and distribution of pollutants, species demography, and the interaction among species.

A solid understanding of the basic ecological properties of an ecosystem is important. However, when analyzing effects, it is also important to consider the effects on the environment at different stages of the economic cycle. The first major relationship between economic activity and environmental effects appears at the stage of resource extraction and management. There will also be environmental effects at the production process level (including infrastructure construction) and at the final consumption level. For example, in the automotive sector there will be effects on the environment as a result of the manufacturing process, but most effects will result from consumption; that is, on vehicle use. In order to develop a comprehensive understanding of effects, it is thus necessary to analyze three categories of economic activity: resource extraction, production process (including technology) and consumption.

Environmental effects of NAFTA may be positive or negative, and may come about by either direct or indirect means.



While the NAFTA debate tended to emphasize potential negative effects, one should keep in mind that there may well be positive effects of economic activity on the environment. Direct effects are the easiest to measure and might include, for example, the results of an environmental impact assessment measuring the amount of pollutants that a particular industry will produce. However, there are indirect effects as well. An analysis of indirect effects involves looking beyond the US-Mexico border region — the immediate area where the most obvious direct impacts of NAFTA have occurred — to the rest of North America.

Environmental effects may also be produced not only by a rise in economic activity but by its decline. This necessitates examining regions where there are different forces operating across sectors, such as the displacement of population, which may lead to economic decline, the abandonment of agricultural lands, and deforestation or forest degradation.

One of the complexities involved in analyzing environmental effects is that they could be synergistic. This means that responses to the activity creating the effect will not be linear and there may also be time delays before impacts can be measured. This is particularly true in the case of global climate change, where change may depend on cumulative, rather than current emissions or pollutant activity, and impacts may also aggregate over time.

There are three generic levels of analysis when examining environmental issues. The first is to look at the number of sources that are emitting or causing the environmental degradation or enhancement. The second level is measuring the pollution intensity of each of the sources. One can do this by looking at the relevant

technology. For example, in the case of autos, this would involve testing the level of engine efficiency of the vehicle. To determine pollution intensity of the source, one would also measure the number of vehicles on the road. A third level of analysis is to integrate these effects into the particular ecosystem from where the pollutants are emitted as well as where they are circulating.

There are three potential types of environmental effects of NAFTA.

1. There may be new trade and investment patterns that could have a negative effect by disrupting the stability of different ecosystems.
2. There may be negative consequences due to indirect effects, such as population displacement, infrastructure change or the deterioration of local institutions.
3. There may be positive effects brought about by the availability of new resources. Such resources could include new technology, institutions or management systems to help restore or conserve degraded natural ecosystems.

A comprehensive or detailed approach to the study of environmental effects of NAFTA should cover different scales. In some cases, this will be an aggregate or national scale while, in other cases, a sectoral or site-specific analysis will be more appropriate. This is not due just to the particularities of NAFTA, but is also a function of the type of environmental issue being addressed. For example, when analyzing climate change, it is necessary to look at the whole country under consideration or else the effects will not be fully captured. In other instances, particular regions that might feel a



specific impact as a result of NAFTA should be identified. In these cases, it will be necessary to conduct a systematic assessment of environmental effects going beyond indicators of environmental stress or quality to conduct epidemiological or toxicological studies. This does not entail the collection of all the required information, but rather access to the relevant studies.

Indicators are one part of the overall research protocol. In order to understand the environmental effects for issue studies, it will be necessary to go through different methodological steps that may begin with a preliminary selection of issue studies, the screening of potential environmental effects, and then move to a final selection of the issue studies that would involve a determination of the critical processes and their linkages with economic activity. The latter point is critical in order to capture indirect environmental effects. It is then appropriate to move to the selection of relevant indicators and the design of a measurement and monitoring procedure.

It is also important to define the baseline or reference case, to understand the isolated effects of NAFTA. To do this, one needs to develop a reference line from which to compare post-NAFTA activity. However, isolated environmental effects of the NAFTA, which represent the core of this study, will be difficult to determine. In many instances, this task will involve a comparison of pre-NAFTA and post-NAFTA data that may not be readily available. The analysis may also entail developing assumptions about what would have happened in a particular environmental context had NAFTA not existed.

The purpose of highlighting these issues is to show that the potential effects of NAFTA cover a wide array of issues

impacting air, water, biota and the land. In order to capture the effects, it is necessary to begin by building a very broad framework and then developing indicators — the exercise underway in this project.

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Work that has been done in the area of indicator frameworks can usefully contribute to the NAFTA Effects Project. The aim in this project is not to develop a state of the environment report, but rather to draw on some of the lessons that have been learned in state of the environment reporting.

There are four frameworks that have been used in state of the environment reporting:

1. An environmental issues framework would focus on indicators of specific environmental issues such as waste management, climate change or biodiversity.
2. A resource framework would consider indicators of natural resource use, such as forestry, energy, fisheries or mining.
3. An environmental media framework would focus on indicators that measure impacts of various activities on the different environmental media, such as air, water, land and biota.
4. An environmental process framework goes beyond previous frameworks and identifies not just individual indicators within each of those areas, but attempts to combine them and link them to human activities that are responsible for the changes in environmental conditions.



The discussion paper indicated that a combination of these frameworks will be used. The primary focus, however, will be on the environmental process framework, which fits well with the concept of connecting processes.

An example of an environmental process framework that has been widely applied is the pressure-state-response framework, adopted by the Organization for Economic Cooperation and Development (OECD). It is also known as the stress-condition-response framework. This framework includes indicators of human activity stressors, such as emissions and effluents from industrial activity or resource extraction. It also includes indicators of changes in environmental conditions and ambient environmental quality, as well as indicators of management responses that identify actions taken to reduce the impact of stressors, or which have been taken to rehabilitate environmental conditions directly.

Having identified a general framework, one must identify criteria for selecting indicators. Ten criteria have been identified in the discussion paper that are useful to this effect. To this list, the criterion “unambiguous” should also be added, although it is a difficult criterion to meet.

Not all of the indicators that are initially selected may meet all of the criteria, but they are important to recognize when evaluating the criteria. There has been a heavy reliance on the criterion of relevance; namely what is relevant to the stated goals of the study and the needs of potential users as selection criteria identifying a preliminary long list of indicators. The long list that is presented in the discussion paper is just the beginning.

Relevance is determined by asking three questions.

1. Is the indicator relevant for issues that were identified in the NAFTA text regarding concerns on the environment?
2. Is the indicator relevant to the environmental issues that were at the forefront of policy discussions at the time NAFTA was being negotiated?
3. Is the indicator relevant to an environmental issue that was either anticipated or identified as an actual impact by experts surveyed to determine what other experts felt the key environmental impacts of NAFTA had been since its implementation?

There is also a fourth category which includes anything else that has been raised but not yet identified. It would also be useful to address directly — and in further detail — stressor condition, and response indicators.

The human activity stressors that will be focused on here are stressors such as emissions and effluents, which contribute to a decline in environmental quality and affect the natural resource base. Two ways in which the magnitude of stressors can be monitored or measured in the industrial sector are through direct monitoring, and the collection of monitoring data from plants, or through collection of economic data. One would then try to link that economic data with emission factors or resource input factors. There are advantages to both approaches. The problem with the first is that it is difficult to obtain that type of emission data on a large scale. The economic data may be more readily available than the environmental data. The advantage of the second approach is that once these emission factors have been calculated for a sector as a whole, they can be linked with economic activity, which avoids the collection of regular



environmental monitoring data when it is not available.

There is an excellent source of emission factor data produced by the World Bank, known as the Industrial Pollution Projection System (IPPS). The IPPS provides emission factors for a wide range of industries. It is presently based on American data, but will be extended to Mexico and perhaps to Canada in the future.

There are a number of problems in using emission factors to calculate the environmental effects of human activities and industrial activities in particular. These problems are identified in the discussion paper. Of particular note is the fact that emission factors tend to be industry averages. When dealing with new NAFTA-induced investments, there is a question of whether that new investment or new plants will actually adopt the average industry-wide technology and, therefore, produce average, industry-wide emissions. This is an issue that would need to be investigated during the sector studies and by means of interviews with company owners, for example, as well as by collecting selective monitoring data.

The condition and/or state indicators measure ambient environmental quality and the current stock of natural resources. They can also be extended to include indicators of human health and social and economic conditions to the extent that they arise from changes in environmental conditions. They also include the larger ecosystem effects. There are a number of excellent data sources for ambient and/or environmental quality in all three countries, but they tend to be highly aggregated in nature.

Finally, response indicators are needed to monitor environmental regulation

activities, expenditures on pollution abatement, or clean-up research.

Figure 4.1 illustrates an example that emphasizes the need to take care in the interpretation and evaluation of indicators against the selection criteria that were indicated in the discussion paper. Certain data was obtained on environmental regulation activity in Mexico, but examples could easily have been drawn from Canada or the United States as well. There was a significant increase in average monthly pollution inspection rates at plants in Mexico after January 1, 1993. One interpretation may be that this clearly indicates that slightly prior to and after NAFTA, environmental enforcement in Mexico increased. That would be a positive effect of NAFTA. However, it is more complicated.

In 1992, Mexico created *Procuraduría Federal de Protección Ambiental (Profepa)*, a separate environmental enforcement agency, which introduced an increased capacity for environmental regulation and environmental inspections. The secondary question becomes, why was *Profepa* established? Can that be linked to NAFTA? Was it a desire by Mexico to demonstrate to the United States during and after the negotiations that the fears about environmental regulation in Mexico were groundless? Or, was it largely due to other internal factors? This example illustrates some of the questions that should be raised when interpreting indicators and highlights the care that must be taken in selecting good indicators.

In the preliminary long list that is included in the discussion paper, the general indicators have been broken down into condition, stress and response indicators for air, water, land and biota. For air, there



Figure 4.1
Environmental Regulatory Activity in Mexico, 1989-94⁸

INSPECTIONS		
Date	Total	Average Monthly Rate
Jan. 1, 1989 to June 30, 1992	7,643	182.0
Jan. 1, 1992 to Dec. 31, 1992	3,713	309.4
Jan. 1, 1993 to Dec. 31, 1993	14,387	1,198.9
Jan. 1, 1994 to June 31, 1994	6,167	1,027.8

are a number of common pollutants, both toxic and non-toxic, arranged by issue area. There are some common indicators for biota and forests. It is anticipated that for the proposed sector studies the list of indicators would be expanded and described in more detail.

PERSPECTIVES

Adrián Fernández Bremauntz

Director General, Environmental Management and Information National Institute of Ecology (INE)

I have ten specific comments on the background document. These comments reflect a perspective based on what has been happening in Mexico on environmental indicators, NAFTA, the border, and other related issues and areas which are developing very rapidly. It is difficult to remain completely up-to-date because in the last three or four months many things have occurred on several of the issues that the discussion paper touches on.

1. It is useful to approach these issues with a multimedia perspective, which includes air, water, hazardous waste

and other issues, because most industrial impacts will be felt in more than one way and will effect many different environmental issues. That is, most industries that pollute the air also generate solid waste or hazardous waste and many of them discharge wastewater. The importance of a multimedia focus has been manifested in efforts such as the Toxic Release Inventory (TRI) in the United States. Mexico has been working on a similar initiative for the past few years and is approaching it from a multimedia perspective, trying not to separate and isolate the impacts of industry on air, water and the generation of hazardous waste.

2. There is a need to underline the importance for Mexico, more so than for Canada or for the United States, of using a conceptual framework such as the pressure-state-response analysis for the formulation of environmental indicators. It is important to use such a framework and to follow it theoretically, because building environmental indicators using only existing information will result in two or three indicators and many unknown variables.

⁸Source: *Sedesol (1993) Informe de la situación general en materia de equilibrio ecológico y protección al ambiente, 1991-92. (México, D.F.: Secretaría de Desarrollo Social, Instituto Nacional de Ecología); Sedesol (1994) Informe de la situación general en materia de equilibrio ecológico y protección al ambiente, 1993-94. (México D.F.: Secretaría de Desarrollo Social, Instituto Nacional de Ecología).*



However, a focus on a strong theoretical framework tailored to the country reality will produce more useful results. Identifying the indicators, even at the conceptual level, should take country-specific realities into account.

3. Mexico is now using as its framework the OECD pressure-state-response method of developing indicators. Mexico has developed some preliminary indicators that have been prepared where good information exists and is also cataloguing those areas where information must be generated from scratch.
4. The Pollution Projection System financed by the World Bank, although not an infallible tool, is worth some attention. It is a good start but it is too limited for this study primarily because the information is generated for the most part in the United States. Therefore, for example, it does not include indicators for technology or country-specific conditions, such as the altitude in Mexico. Mexico is attempting to generate such country-specific indicators. Also, there is a very strong move to start to develop inventories of indicators. The tool as it now exists is useful regarding the conceptual vision but will not be as useful in the future.
5. It is difficult to establish causation using a response indicator (such as participation, action or authority) to address an environmental problem. For example, the establishment of the *Profepa* office, and the subsequent exponential increase in environmental inspections, visits or sanctions are the result of a series of factors that converged in such a way that it is impossible to attribute them to the signing of NAFTA. Mexico created the office of *Profepa* as part of an institutional trend that was already underway to develop options for better environmental administration in Mexico. Through this process, it was decided to separate regulatory environmental activities in two large areas: policy development, which was left to the *Instituto Nacional de Ecología (INE)*, and enforcement, which is carried out by *Profepa*.
6. In the case of Mexico, a good deal of attention should be spent establishing priorities, taking into account the scarcity of resources. Moreover, priorities can vary as between the countries in North America. Discussing indicators that may be relevant for the international community such as acid rain and climate change may not reflect Mexico's priorities. There are others more closely related to the Mexican reality that could be priorities. Beginning from an international conceptual frame, the Mexican government is already making the appropriate moves to tackle its priorities and not to use limited resources, at least in the short term, to address issues that are of secondary importance. The differences in priorities between Mexico and the United States have precipitated a number of consultations and even some disputes such as the question of whether or not the Carbon II plant located in northern Mexico creates visibility problems in Big Bend National Park in the United States.
7. It is also important to bear in mind that there will be different levels of aggregation of information. There are national, regional, and local statistics. There is more information gathered for those areas and issues that are considered priorities or that have received a lot of attention. The US-Mexico



border area has received a lot of attention in the last few years. This has generated increased human and financial resources dedicated to the border in such a way that it is resulting in the collection of a lot of information. While this is important, there could be more serious problems particularly in other parts of Mexico where little attention is being focused.

8. Another important point is that, given limited human and economic resources, Mexico does not have the luxury of generating indicators or taking specific initiatives on the border, within NAFTA, the OECD, or other institutions. Fortunately, Mexico arrived late to many aspects of environmental management, starting from zero and from a relatively low information base. In contrast, in Canada and the United States, where a lot of human and financial resources have been invested and time spent on these issues, there are often different focuses and groups developing indicators working with a variety of conceptual frameworks. Mexico is trying to avoid this approach, by attempting to start with a few elements and to proceed with an integrated effort. Mexico will then play a more active role in the OECD along with other efforts to collect information and evaluate the state of its environment. The collection of this information will follow the conceptual framework, because Mexico cannot afford the luxury of doing the work twice.
9. In the international context, the activities and the obligations that Mexico has undertaken help it to better interpret the principle of sovereignty in the context of international environmental dynamics. Not many years ago, it was considered to be an enormous offense to request information

collected in Mexico. However, this is changing. At present, the Government of Mexico has to confront not only the growing participation of civil society within Mexico, but also act as a bridge and respond to the international community, including international nongovernmental organizations (NGOs). This means that sovereignty is being strengthened with a greater international presence and is advancing in a mature way, where the environmental authorities and the Secretariat of Exterior Affairs in Mexico, the Department of State and the Environmental Protection Agency (EPA) in the United States and their counterpart ministries in Canada have been working together more closely to handle different environment issues that have transboundary impacts. The continuing monitoring of environmental issues is a positive impact of NAFTA. Another more indirect, but nevertheless positive, impact is that despite the decline in the growth of the Mexican economy, Mexico's international commitments mean that the environment will remain high on the government's agenda. This is a enormous benefit at a time when the Mexican Government is experiencing budget cuts. It will be difficult to make substantial cuts in the environmental sector given the strategic priority that it has become.

Another general point concerns the impact or benefit that all of these discussions will have, the results of the transparency of the NAFTA process, the new analysis, in addition to the new means of communication and telecommunication. Ten years ago, it was more difficult to communicate what little information existed. Now, almost instantly, it is possible to share information, including the environmental indicators that will



become the basic structure of Mexico's state of the environment reports, as they have already become in other countries.

10. Finally, for the environmental authorities in Mexico there are two major aspects which are encouraged by NAFTA and other initiatives. The first one is public participation. That is, in the measure that the government is more transparent, shares more information, and keeps both the public sector and the NGOs informed of what the priority environmental issues are. This will create strength and allow Mexico to move ahead in the area of environmental management. The second issue that empowers the present government is the international context and the public obligations to which it has committed itself. Without a doubt, these commitments and the major challenges confronting the country will encourage movement towards modern environmental management in Mexico.

Ian Rutherford

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Environment Canada*

Environment Canada has developed a comprehensive environmental reporting program that has been in operation for a number of years. Despite severe budget cuts, this program will hopefully continue. A great deal has been learned in the process of devising indicators for the program that will be useful for informing both the public and policy makers about environmental conditions in Canada. These may well be useful for this exercise.

First and foremost, great importance has been placed on developing indicators

that will provide information to the public: that is the foundation for good policies. Without public support, there are no policies of any kind, good or bad. Thus, it is important that the policy-relevance of the indicators be examined.

Indicators should not be separated from environmental reporting. Indicators are a large part of any report on the state of the environment or on sustainable development. The environmental reporting program at Environment Canada uses a modified pressure-state-response framework for indicators. Four questions are generally asked: What is going on in the environment? Why is that important? What is causing it? What are we doing about it? Thus, the framework used at Environment Canada is stress, condition, effect and response.

The effect component of the framework is important as it is the reason underlying the concern about environmental issues: effects on the viability and health of the ecosystem. These issues are sometimes difficult to isolate, but they are the questions that the public is most interested in. For example, the public is not particularly interested in the level of nitrogen dioxide in the atmosphere, but they do want to know how it might affect them. This element of "relevance to the public" has not been emphasized in the discussion document and is worthy of attention. However, an example of the difficulty in working with the question of effect is seen in the recent attempt by Environment Canada to determine the effects of excessive UV radiation on biota and on human beings. It has been an extraordinary challenge attempting to reach agreement between the ecological and the medical communities as to what those effects are. The balance between ensuring that one is scientifically valid but at the same time trying to make a link with



important public issues is difficult to find.

Spatial frameworks were alluded to in the presentations today. It is important to remember that the type of scale used for analysis may vary according to whether that analysis is of a stress indicator, a condition indicator or a response indicator. Environmental stresses can be highly local and their effects may also be quite local. On the other hand, stresses can also be global, such as in the case of CO₂ emissions. For issues such as climate change, one must analyze the stresses in the global framework. But the effects in the conditions are highly dependent on the locale. In the case of climate change, the effects are intrinsically ecosystem- and geographically-dependent. The importance of the effects will depend on the ecosystem in question. An issue such as acid rain, for example, requires examination in light of the susceptibility of the receiving ecosystems' relative abilities to cope with stresses such as excess acidity and precipitation, or dry deposition.

One should remember that different scales of analysis may be required depending on whether one is dealing with stress, conditions, effects or response. There are generally human, social or political responses for which the relevant scale of analysis is politically determined. It may be a state or provincial response, a national response or an international response. Again, the effect of the problem will probably differ depending on the source of the problem.

It is also necessary to prioritize efforts in certain areas. There may be problems that are locally unimportant whose investigation does not warrant a large amount of financial resources. While that may be true with respect to effects, it does not necessarily hold true for contributions to

a global problem. There should be an obligation to look at global issues, even though they may not be important locally. Tropical countries, for example, may be contributing to climate change through certain activities. This may not be a priority issue for them because their local, tropical climate will not change. However, their contribution should nonetheless be calculated. Conversely, countries in the northern hemisphere probably engage in activities that affect the tropics. There is an obligation to examine their contributions as well.

There is a movement towards examining what indicators can actually show in terms of response to policy, for example. This is an attempt to make the link between the pressure-state-response and the feedback better. Sometimes it is easy to see. For example, there are some very good indicators of Canada's decline in the supply of ozone-depleting chemicals, decoupled from the gross domestic product (GDP). In most countries, the use of these chemicals is highly coupled to GDP, especially prior to the agreement for the reduction of ozone-depleting substances. It is important to illustrate these relationships on the same graph.

It would be a mistake for this study to rely too heavily on the World Bank pollution emission intensity figures or on any other fixed pollution intensity figures. Pollution intensity is probably one of the most important indicators to measure. Emission factors should be measured, not assumed. If there is agreement that society requires economic development in order to improve welfare but at the same time must minimize environmental impacts, then ecoefficiency should be looked at. Ecoefficiency is the ratio between environmental impact and the activity in question. Examples of ecoefficiency include energy intensity of the economy, CO₂



intensity of energy production and pollution intensity of a particular industry sector. These are very important to measure because they focus on what should be monitored and reduced.

In Canada, there has been a lot of attention paid to the pulp and paper industry, which has been a heavy contributor to water pollution. Some excellent figures have been developed that show the reduction of the emissions of dioxins and furans due to changes in industrial processes. It is important both to measure those figures and to make them public, because they indicate and give confidence to the notion that progress can be made. It is very important to reduce indicators such as automobile gasoline mileage, emissions per automobile and emissions per mile travelled — and they are possible to reduce. Some people claim that ecoefficiency must be improved by a factor of ten in order to reduce environmental impacts to levels that would sustain a desirable standard of living everywhere in the world.

In the context of NAFTA and the question of causality, there should be less emphasis placed on whether NAFTA is affecting the environment. What should be looked at is overall ecoefficiency followed by the question: does NAFTA encourage or discourage measures that improve ecoefficiency? It is possible to argue that trade liberalization and increased communication intrinsically encourage improved ecoefficiency. For example, the dissemination of information on new and improved processes as well as their availability reduces the industry's risk of becoming the subject of commercial and other trade barriers.

William Eichbaum

*Vice President, US Programs
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I first became concerned about the problem of assessment and the relationship between economic and public policy and environmental effects twenty-five years ago, when I was responsible for enforcing all of the environmental laws in Pennsylvania. One of the major environmental issues in Pennsylvania in the early 1970s concerned the steel sector, particularly the steel industry located near Pittsburgh. A great deal of time and effort was spent on legal action, pursuing the steel industry in lawsuits ranging from criminal to civil. Now Pittsburgh is a clean city: the air is clean; the rivers are clean. One could look back and say that the effort paid off. Of course, looking a little closer, one realizes that there is no longer a steel industry in Pittsburgh. This begs the question of causality. The steel industry is not gone because of the lawsuits; the steel industry is gone because of major changes in the economics of the steel industry, including international trade.

There are two key points in this story. One is with respect to causality, realizing that it is very difficult to isolate. Second, in assessing the effects of NAFTA, it is very important to keep in mind that those effects will be felt throughout North America. For example, Oregon pear farmers have been looking forward to the growth in their agricultural activities that will be brought about by increased competition as a result of NAFTA. However, this increased growth will lead to a number of important environmental effects, such as increased water use in



the Rogue River Valley, and the effects that this may have on efforts to restore the natural salmon runs in that valley and others of southwestern Oregon. Thus, effects do occur throughout the region and an assessment process has to be mindful of that.

Undertaking an assessment process such as this is an extraordinarily difficult process. The objective of this project is to identify the environmental effects of the NAFTA system in order to address concerns and identify ways in which the regime can operate in an ecologically supportive way in the future. That is a daunting task. There has been a great deal of discussion here today about the design of that assessment process but one thing that has not been discussed is the issue of posing a starting set of hypotheses or questions around which to design the assessment.

The discussion document indicates that a totally comprehensive study cannot be carried out. Thus, it is important to pose targetted questions that can translate into scientifically rigorous hypothesis statements. The assessment should be carried out in a way designed to test those hypotheses, and presumably provide data going to issues that address the ultimate question: What is the state of the environment?

The starting point for this exercise is not the trade side. The starting point is the environmental dimension and identifying hypotheses that can be set up about the effects of trade and economic activity on those environmental hypotheses, and then testing them in a selected number of cases to see if the answer can be determined.

The discussion about the role of assessment should be broadened. The discussion paper recognizes the notion of the

emergence of a sense of a North American community, which is in part based on a NAFTA-wide, integrated, production and economic system. Achieving that sense of community is a very ambitious, long-term and broad goal relying on the notion of integration. The question becomes: Does the process of assessment, monitoring and dissemination have a role to play in that larger exercise of attempting to achieve integration? I think that it does. The experience of the State of the Environment Reports in Canada and elsewhere suggests that an integrated assessment of the condition and effects of the economic activity on the state of the environment is a crucial way in which to bring about a larger sense of society's understanding of the integrated nature of its enterprise.

The study cannot be based on a random collection of questions. These hypotheses must be selected very carefully, and an effort at setting forth the strategy for doing so has been presented in the discussion document. However, crossing through those discrete sets of questions and approaches, there needs to be a theme of integration.

Also, it is very important to have that integrated approach to an assessment process, both because of the policy and social implications that flow from it, as well as from the degree to which it strengthens and enhances the scientific base and value of the assessment process. Right now, the United States is undergoing a process of redesigning the national environmental monitoring and research networks and programs. One of the theses of this integrated effort, lead by the EPA, is that an integrated system plays a much richer role in the science life of the community. The same would certainly would be true from the North America perspective as well.



There has been virtually no discussion here about the uses of the assessment process. One clear role of the assessment of environmental conditions is that it has always been extraordinarily important as a mechanism for measuring political accountability. This is particularly important in the case of NAFTA, not only within the national context of each of the three countries, but also in the collective commitment that the countries have made to moving forward on this process. Assessment is one of the few ways in which explicit accountability of the political process can be achieved.

A second important role of assessment is in building public constituencies. Without pre-judging what the assessment is going to demonstrate, it seems that it is extraordinarily important that an assessment process be carried out and communicated in a way which engages the widest range of the public. They either believe they have a stake, could learn that they have a stake, or actually should have a stake in what the outcomes of these processes are, not just of the assessment but of the NAFTA process itself. In fact, some areas that are beginning to move in that direction within the countries have already been identified, with the public right to know being perhaps notable in that regard. Do not think of those as tools that occur only in the national context. Think of this North American assessment process as playing a very rich and a very important role.

It is inevitable that this will be an ongoing process. Therefore, the design of today's work needs also to be done in a context that recognizes that it is laying the foundation. This simplifies the task, but at another level makes it more complex. However, as with the overall process, which is assessment and then hopefully feedback into the overall regime of NAFTA, the design of the assessment project itself should incorporate evolution, feedback

and growth in order to meet some of the more ambitious goals it might have.

Finally, there should be an emphasis upon that part of the assessment process that is referred to in the discussion document as "biota". One of the projects that the WWF is carrying out with a number of experts in Canada, Mexico, the United States, and in co-operation with the CEC, is an effort to identify, achieve an understanding about, and assess the threats to the ecoregions of North America. This is also a very ambitious undertaking. The process will define and prioritize the ecoregions according to characteristics such as distinctiveness and large, intact habitats. The project will then go on to assess issues such as the sensitive species living in those ecoregions, the habitat integrity and the ecological processes the regions are dependent upon. What follows is a rough assessment of the value of these regions, their importance from the perspective of global, regional, and even local biodiversity conservation, as well as the threats. This is an extraordinarily important starting point, in terms of an assessment process. It is critical to select a few ecoregions in North America that are most characterized by some of these high-value, biodiversity criteria. Such ecoregions must be those where one can construct reasonable hypotheses concerning the relationship of their status and their resources to some set of issues that may be raised by the NAFTA regime. Thereby, one can begin to obtain some very explicit answers of the effects.

This brings me back to the beginning. This study should start with the question: What is the effect on the environment? It should then return to the trade regime to test the relationships, in order to suggest public policies that could take remedial action if necessary and appropriate. This is the first step in what is a long process. It is one that needs to build its richness and its robustness over time.



Chapter 5: Connecting Economic Processes with Environmental Effects

INTRODUCTION

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These brief introductory remarks will focus on the overall principle of connecting economic processes with environmental effects. Figure 5.1 illustrates a very useful way of looking at the issue. It contains three of the principles from the Rio Declaration, which was developed at the Earth Summit in Rio de Janeiro in June 1992.

Figure 5.1

Principle 3: The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

Principle 4: In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

Principle 5: All states and all people shall co-operate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.

The Earth Summit in Rio was a gathering of groups and individuals who were interested, on the one hand in environmental

protection (a priority in the developed world) and, on the other hand, in development (a priority in lesser-developed countries). These two groups gathered together to consider the issue of sustainable development and to try to move ahead in a new way, to sit together at the same table, talk about their differences, and determine how they could be reconciled so that progress could be made together.

From a very pragmatic perspective, progress is possible. But if you decide that you cannot make progress then you will not. The beauty of sustainable development is that it brings opposite priorities or opinions to the same table. The three principles listed in Figure 5.1 are among those that were agreed upon unanimously by all of the countries at Rio. They clearly state that the environment and economic well-being do not have to be in opposition; they can be coupled and mutually supportive. That is the emphasis in all three of these principles. In fact, economic well-being in the long term is impossible to achieve without a healthy environment and the reverse is also true: environmental protection without economic capacity cannot be pursued effectively. The two do not necessarily have to threaten or destroy each other. Both are necessary and are mutually supportive and interlocking when working properly. Thus, if sustainable development is pursued with this basic premise in mind, it will be possible to make progress; and if not, we are doomed to squabble. While carrying out this work, it is important to constantly remind ourselves of the mutuality of responsible development and environmental protection, the principles which emerged from Rio.



CENTRAL CONNECTING PROCESSES: PRODUCTION, TECHNOLOGY, TRANSPORTATION, SOCIETY AND POLICY

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Perhaps the most critical and difficult analytical linkage in the framework being constructed is connecting NAFTA-related trade and investment to stresses on, and changes in, the ambient environment. One way to identify these links is to ask: how do the individual firms primarily responsible for NAFTA-induced trade and investment conduct their operations in altered ways that have differential effects on the environment? Here a distinction can be made between the three broad types of industry that are central to the NAFTA changes. Hypotheses can be advanced about the likely environmental impacts of each of these three types of industry.

1. Engineering industries. These are the advanced, high-technology industries that operate with heavily integrated production systems across the three countries. There is a lot of transnational intercorporate ownership among the three NAFTA countries and the impacts on the environment should be positive, on the whole. These industries should generate increased trade, which in turn stimulates increased road traffic, as well as air pollution. But these impacts will likely be offset to a greater degree by the emergence of more efficient production processes and environmentally enhanced technology that will be embedded in these companies'

products that cross the border. There should also be broader technological diffusion both through products and production cycles.

2. Name brand, or consumer, goods. The environmental impacts of this category are generally negative, largely due to increased consumption effects. The sustainable development concern with the consumption effects of trade liberalization is of central importance here. For example, changing product composition, through the increased use of plastics and other potentially nondegradable materials in products such as toothpaste, as well as through increased road transport of imported consumer goods, will likely result in greater stress on the environment.

3. Standard products or commodities. Environmental impacts here are likely to be negative. This is largely due to their increasing drain on the natural resource base and on the ecological capital of the three countries as a consequence of increased NAFTA-induced production.

These basic distinctions and hypotheses may be explored through several methods. The 75 interviews already completed confirm the value of relying to a substantial degree on specialized personal interviewing techniques, that are focused on stakeholders of the major firms responsible for NAFTA-induced trade and investment. This is a manageable task, because NAFTA's transborder trade and investment is overwhelmingly concentrated in a small, readily identifiable number of firms. In the case of the Canada-US trading relationship, which is the largest in the world, over 50 percent of Canadian exports to the United States are accounted for



by only 50 companies. The degree of concentration in the other two-way NAFTA trading relationships are broadly comparable. Thus, it is possible to identify these firms while relying on publicly available information and, through interview research as well as other techniques, to determine how their operations are changing in the post-NAFTA period.

The interviews already conducted suggest several changes in corporate operations, both internally and in relation to outside firms, social organizations and governments. On the whole, the interviews point to the value of thinking of the processes that connect NAFTA trade and investment to environmental stresses, responses, and ambient changes in terms of four factors or pillars: production, infrastructure (including transportation), social organization, and government policy.

1. Production. How does production that is either created, reduced or related as a result of NAFTA-related trade and investment flows, impact the environment? There are a number of processes to be traced.

- population movements, as workers and their families concentrate in particular areas, including settlements around the new industrial activity in the *maquiladoras*;
- new demands and new drains by plants on natural resources;
- residues and emissions generated by NAFTA firms and plants;
- changes in environmental equipment and technology embedded in the new production processes and plants;
- new environmental management systems, including an environmental culture, being built into the management of some of these firms, expanding their activity relative to

those contracting; and

- new products, with properties of waste and disposability into increasingly distant locations and times.

As a general approach, one could first assess the “ecoefficiency”, or the efficiency of the production process. One could then assess the products emanating from these plants with a focus on the forward stage of a lifecycle analysis of product effects and the backward stages of natural resource use. Finally, one could raise questions about the broader awareness and values of the stakeholders involved in those firms and plants, including any emerging new consciousness of the interdependence of the NAFTA community and the intergenerational effects of its activity.

2. Physical infrastructure (beginning with transportation). This connecting process focuses on the major high-impact areas of the transportation network, such as road traffic over particular transborder crossing points in Texas and other border areas. It also looks more broadly at the new transportation grids that NAFTA is inspiring throughout the continent, particularly the north-south corridors from Mexico through the United States up to Canada. Also important are the impacts on urban infrastructure. This includes the ways that NAFTA activities might overwhelm existing infrastructures, or generate stresses more rapidly than the capacity of local communities to cope. Finally, there are the tendencies to create more megaprojects, such as new development grids across the south of Mexico or into northern Canada, in order to take advantage of the new, integrated economic zone in North America.



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Social organization is one of the factors that should be considered when examining how NAFTA-induced processes generate environmental effects. At the core of the complex dynamics of social organization is the specific process of migration. Migration has two components: the general movement from rural to urban areas; and the attraction of people to specific locales that offer high economic and employment opportunity. Both of these components have been affected by NAFTA and the policies it inspired.

For example, under NAFTA, the liberalization of Mexican corn tariffs was negotiated. This resulted in a drop in high Mexican corn prices to the lower international level. This liberalization and ensuing price realignment was designed to take place over a period of 15 years. However, due to the 1995 economic crisis in Mexico, corn prices fell dramatically over two years. Prior to NAFTA, a liberalization of agricultural input prices was already underway. This substantially reduced the potential earnings of Mexican corn producers and led to the reduction or collapse of rural labour markets in certain parts of Mexico. The NAFTA liberalization of corn prices unleashed a further wave of peasant migration, thereby dislocating community-based organizations. In communities such as Frailesca de Chiapas, this process and the resulting collapse of social organization is clear.

NAFTA has also affected social organization through a second dynamic — the development of new employment opportunities. One example is the expansion of the *maquiladora* sector in urban and semi-urban zones. In the case of urban

ecosystems, the arrival of a new workforce can result in increased stress on the local ecology.

In general, the dynamic is as follows. Ecosystem stability is a balance between available resources and stress or demands on resources. Urban ecosystems have a threshold of resilience: this is the product both of regulation and balance between distinct ecosystemic factors. For example, migration can act as a force to push an ecosystem closer to its threshold of resilience. Migration is capable of causing the collapse the ecosystem to a new, lower state of equilibrium, thereby creating a system endowed with fewer resources.

The effects of NAFTA upon many rural ecosystems can be summed up in three possible scenarios:

1. NAFTA might reduce the rate of migration and thus population pressures on the environment, resulting in ecosystem stabilization. This is especially true in geographic areas where populations are flexible and have a relatively well-developed capacity for social adjustment.
2. However, human pressures may overwhelm the ecosystem's resilience. The process of a shrinking labour market or the disruption of community organizations can destroy the capacity of social groups to manage the ecosystem, thereby draining the available energy or biomass within the ecosystem.
3. Social forces may also exist that promote conservation, restoration and environmental protection, which can help to maintain an ecosystem in a stable state.

Thus, NAFTA can affect the sustainability of ecosystems in three general



ways. The first is that, through migratory effects (or more generally through investment and trade), NAFTA can create ecological instability through the overexploitation of resources or through the effects of increased consumption by a larger population. NAFTA may also have the positive effect of reducing pressure on the environment, and thus reducing overexploitation. Finally, NAFTA may contribute to the erosion of socio-ecological processes that maintain the stability of the agro-ecosystems, such as forests.

NAFTA has another important and potentially positive feature: it can shape policy. The direct and indirect resources of NAFTA, mediated through an increase in public and private investment, can provide the needed resources to reconstruct institutional structures and, with these, re-stabilize the system. This investment can take place throughout all of the four connecting processes discussed in the background paper. NAFTA can promote new technology, new infrastructure, new forms of social organization and new governmental policies that will promote ecosystem stabilization.

In particular, within the process of social organization there may also exist issues of human capital investment, along with many changes: changes in values; in consumption; in the patterns of information and “know-how”; and in economic institutions. Such changes can affect the formation and characteristics of social groups, and further alter the relationships that such groups maintain within their respective countries.

Of particular importance are the changes to economic institutions. In large measure, the influence of NAFTA on the environment will depend on the economic institutions through which the NAFTA

regime operates as well as on the economic policies it promotes. These economic instruments may range from those that structure private property rights and the market, to the capacity of markets to internalize values at the local level. In situations where externalities or market failures exist, more economic activity may widen the gap between the social costs and private benefits of using natural resources. This gap should be considered when trying to analyze causality or when constructing a qualitative analytical model.

For example, due to changes induced by consumption patterns of the local population, species and genetic diversity may lose their direct or indirect value. Thus, the failure of the market to allocate global values to natural services at the local level could have disastrous consequences for biodiversity. If this type of market failure exists, the effect of changes in consumption patterns could be negative. On the other hand, NAFTA could have a major influence on the economic institutions that determine the capacity of markets to recognize the value of ecosystem services, and apply these values at the local level. A classic example is organically-grown coffee in Mexico. International investments have created markets capable of valuing certain elements of the ecosystem that are required to produce such coffee. Thus, such elements are considered to be paid for by the local population, which is now disposed to recognize their true values. This has increased the practice of sustainable development in various localities.

Therefore, there are several complex component processes that connect NAFTA's legal, institutional, political and economic changes to the natural environment. It is very important to understand these processes, if not quantitatively then at least qualitatively, in order to design a framework within



which these types of phenomena are considered. Such a framework must also consider the equally complex dynamics of NGO activity at both national and sub-national levels.

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The rationale for working on priority sectors within the general framework of the NAFTA Effects Project is to elevate the analysis to a level where the relationships among infrastructure, social groups, technology, government policy, and the environment can be addressed. Sectoral studies can contribute to the analysis at the national and the North American levels. The following is an illustration of what the main elements of such an analysis might be.

There are several reasons that the automotive/transportation sector was chosen as an illustrative sector in the discussion paper. First, the sector is critical with respect to North American trade flows, tariff reductions and trade liberalization. The transportation sector is undergoing a gradual, ten-year process of trade barrier liberalization, which poses short-, medium- and long-term questions about its development. Transportation has also accounted for a large amount of transboundary trade between the three countries in recent years, with clear increases in the last two years since NAFTA went into effect. Thus, it has important economic impacts in North America.

The automotive/transportation sector also has significant environmental effects, both during production and assembly, as well as in vehicle use. The potential magnitude of both direct and indirect environmental effects pose challenging

and important questions for analysis. Among other things, transportation has a major impact on land use. Transportation infrastructure is developed across countries and regions, and the impacts are wide-ranging. There are impacts on land, water, and air that can include the disturbance of watersheds and the destruction of forest lands.

Transportation is also a sector where community impacts can be tremendous through discrete technological and economic changes. For example, exceeding the threshold capacity of air basins due to traffic congestion is common in many air basins on the continent. However, impacts derived from improvements in gasoline and combustion processes may be positive. Current negative impacts have the potential to be changed within five years or less, with the use of new technologies and improved gasoline.

There are three dimensions for study that are particularly important in the automotive/transportation sector: the first dimension is production and assembly, the second is vehicle use, and the third is transportation infrastructure. For each of these dimensions, there are four further levels of analysis.

1. The first level at which the problem is addressed involves geography: regions, cities and communities. Impacts may be site-specific or cover an entire region.
2. Environmental impacts can be analyzed at a local level or as an ambient quality problem in an air basin or in a watershed.
3. Technological and regulatory aspects involved in each part of the sector concern the level of technological innovation within the sector, as well as the national or sub-national



regulatory responses, including enforcement.

4. The range of variables dealing with social implications that affect the development of the sector: population, employment, and economic activity.

When analyzing production and assembly, one looks first at production sites. These are the locations that are chosen for investment, new facilities, or the expansion of existing facilities. The associated environmental impacts are those fixed-source emissions and discharges at the plant level that are site-specific. Their impact is primarily local, although they may be felt more broadly across regions. The technological and regulatory aspects of production and assembly are dealt with by built-in capacity environmental controls. These are corporate procedures that are generally applied at the plant level, which include formal environmental impact assessments developed from a pre-feasibility planning stage and applied to the process through to final construction. At the production and assembly level, there are usually federal regulations and well-developed procedures with which plants must comply. The role of the states and municipalities may well be relevant with respect to controlling or overseeing the environmental performance of these plants, but generally an analysis of production and assembly concerns broader sectoral and federal dynamics. The social implications of plant development and assembly sites are generally derived through formal employment plans and have both regional economic and environmental impacts.

The second dimension of the transportation sector that is very important is actual vehicle use. This analysis begins where cars and vehicles are used in the most concentration. Cities and specific

regions usually carry the burden of the growth in vehicle fleets throughout Mexico and in the three NAFTA countries. These environmental impacts are mobile source impacts — emissions affecting ambient air quality in cities and regions. The assessment of these impacts is complex and involves the actual measurement of emissions from vehicles. Alternatively, the assessment can be based on emission coefficients, according to the combustion process and vehicle model types. The calculation becomes more complicated with the application of dispersion models and related monitoring devices that assess environmental impacts in other ways.

The technological and regulatory components involved in analyzing vehicle use are the fuel quality and combustion processes, which are important with respect to mobile emission sources. For example, Mexico continues to substitute leaded gasoline for unleaded gasoline. This is a federal policy that has an important impact on the environment. Mexico also has state and municipal responsibilities because of the implementation and enforcement of the use of leaded gasoline. These enforcement obligations range from simple procedures conducted at the time a car is registered, to smog checks as often as twice a year, in Mexico City.

With respect to social implications, vehicle use is linked to, or dependent on, income and is affected by the age of the fleet and the rate at which older cars are replaced with new cars. This is related to individuals and their income. Currently, there are economic constraints to fleet renewal in countries like Mexico. However, as the economic situation improves, there will be a trend toward replacement and, thus, positive environmental impacts will ensue.



In society, there is a trade-off between mass transit and private vehicle use. It is a national decision to sponsor mass transit to reduce the burden on private cars and promote adequate public transportation in cities. Again, as the economic welfare of cities and regions improves, there may be more emphasis on private vehicle use.

The third dimension of the automotive/transportation sector is the transportation infrastructure to support passengers and cargo. Infrastructure is broad and includes streets, highways, railroads, ports, border crossings, and airports. The environmental impact of this infrastructure is both direct and indirect. Impacts will occur at all phases of infrastructure construction, operation and maintenance. Construction, the initial phase, is the critical one from an environmental viewpoint. Impacts here will affect land, water and air. However, maintenance is also very important. For example, maintaining the pavement on roads and highways is important in terms of the efficiency of vehicle use and fuel combustion.

Regarding the technological regulatory aspects, one can refer to the straightforward environmental management procedures that are required by funding agencies. With the involvement of the private sector in infrastructure building, there is an interest in introducing environmental impact, technology and regulatory aspects because these compose the risks related to the investments taken by banks and other funding agencies.

Under the social implications of transport construction, one should also consider regional economic integration, because transport infrastructure provides the linkage between the production, distribution and consumption of goods and services. The social benefits of infrastructure are potentially broad depending on

the type of transportation infrastructure facility in question. Infrastructure can also be addressed from a binational perspective.

There is a high degree of participation by the private sector in transportation infrastructure, which should also be considered. The promotion of transportation infrastructure is currently controlled by the private sector, due to the fact state and federal governments have increasingly less capacity to build and maintain infrastructure.

PERSPECTIVES

Robert Morris

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It is very important that any conclusions from this project be supported by clear evidence. The analysis must be very careful, particularly when finding potential negative effects of NAFTA, they must be demonstrable rather than simply the result of a theoretical analysis.

Attention should be paid in this effort to distinguishing the effects that are actually derived from NAFTA itself, rather than those that might normally be expected from the process of economic development in Mexico and elsewhere in North America. The danger exists of falling into a trap and of attributing virtually all of the ills of the process of modern development to the trade agreement. That would be a serious mistake and would provide ammunition to those in the United States and elsewhere who feel that NAFTA ought to be either rescinded or at least radically changed. That potential exists because NAFTA is not very popular, at least in the United States.



Transportation and its infrastructure are essential issues for examination and analysis in this project. For example, one direct result of NAFTA is a pilot program being instituted by the US Customs Service to move their clearance points away from the border with Mexico and farther into the United States, sometimes on highways ranging from twenty-five to one hundred and fifty miles away from the border. That is a very creative and efficient way of dealing with a potential transportation problem. It would be interesting to discover how it is working and to evaluate whether there are possibilities for its implementation in Mexico, or perhaps even on the US-Canada border.

With respect to social organizations, the analysis in the discussion document tended to stress the role of environmental NGOs and the interconnections that can be developed among the environmental groups in the various member countries of NAFTA. The business communities of the three countries are taking initiatives as well. The US Council for International Business has developed a memorandum of understanding with its Canadian counterparts and with a Mexican business association to promote the dissemination of best environmental management practices among the three countries. This is a positive example of how NAFTA has contributed to the development of greater communication and an exchange of information that should be beneficial to the environment.

The section in the discussion paper on government deals almost exclusively with how the withdrawal of government controls will have deleterious effects on the environment in Mexico. This must be balanced by an analysis of how inducing government withdrawal from certain industrial sectors might have some very beneficial environmental effects. For example, at least one government-

controlled Mexican company is not internationally recognized for its high environmental standards.

The idea of accelerating tariff reduction and the removal of trade barriers for environmentally friendly goods and services is a good idea and deserves more attention.

Petrochemicals is an important sector for study. The American chemical industry has had useful experience in developing its Responsible Care program. The input of both the Chemical Manufacturers Association (CMA) in the United States and individual companies could be useful for this process.

The forestry sector feels that it is under attack by the environmental movement and by governments. Caution should be taken when dealing with the forestry sector because it is a sector which can be very constructive and has the potential to contribute positively to the analysis in this project. A sectoral analysis would be well-served by looking at some of the analyses that are being conducted in various regional organizations outside the North America. Sectoral analyses are being done at a variety of institutions, such as the Commission on Sustainable Development, the Intergovernmental Panel on Forestry, and the International Tropical Timber Organization. They often consider the same sets of issues, so one must be careful not to re-invent the wheel. In addition, there are some issues that are unique to the NAFTA countries and the North American environment which deserve analysis. Any analysis of the forestry sector should take into account the views of the responsible sectoral organizations such as the American Forest and Paper Association. This exercise will be more constructive if the cooperation of representatives of associations are taken into account when developing terms of reference.



Some stakeholders think that higher environmental standards among industries will reduce the competitiveness of those industries in countries possessing such standards. But the US Council for International Business has the opposite opinion.

At least two recent examples in the United States, where higher standards were imposed in ways that created alliances between American environmentalists' and protectionists' interests, promoted an outcome where the foreigners were required to bear the full cost of the higher standard. The Corporate Average Fuel Economy (CAFE) requirements choices were designed essentially to protect the American automobile industry. This reformulated gas regulation was imposed on the EPA by Congressional pressure emanating from an American oil company that wanted to improve its market share in relation to Venezuela. This is not necessarily a useful way to conduct environmental policy, but it often reflects the politics of how environmental policy is made.

It would be useful to consider ways in which alliances could be created between those who are interested in free trade (not just the protectionists) and environmentalists. The outcome would still be positive and it would be much better for trade.

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Transportation services include, among other things, airlines, trucking companies

and railroads and they can have significant effects on air quality. Depending upon what is measured, transportation services will generate between 20 and 80 percent of total urban air particulates. Thus, when examining the issue of environmental effects, transportation services are an important factor to be considered, especially in terms of air quality.

Figure 5.2 illustrates some of the processes connecting transportation, NAFTA, and the environment. In simple terms, NAFTA will likely generate increased international trade which, in turn, will lead to economic growth in one or all three of the economies of North America. Economic growth will lead to increased demand for transportation services, which will have an effect upon the environment.

Transportation services will likely also be linked to NAFTA in a number of indirect ways including, for example, through the privatization of the Mexican rail industry. Privatization and other policy changes induce what transport economists call "mode shifts". Trucking is a mode; rail is a mode; air transportation is a mode. Policy changes cause shifts in the types, or modes, of transportation services that are used — and these shifts will affect the environment. For example, if there is a mode shift away from truck to rail, the effect will be positive if rail is a more environmentally friendly mode of transportation. It is likely that NAFTA will increase the use of air transportation, but any change of mode will affect the environment in some way.

Figure 5.2 Connecting Processes

- NAFTA → trade → economic growth → environment negative
- NAFTA → privatization → mode shift → environment negative or positive
- NAFTA → trade → logistical efficiencies → mode shift → environment negative or positive
- NAFTA → import substitution → change in transport distances → environment positive



Another indirect effect will be in “integrated industries”, where there are various stages of production in different locations that are integrated through transportation networks. If NAFTA stimulates trade and leads to economies of scale, it is likely that logistical efficiencies will result. Often, it is much easier for a large organization to adopt new, innovative, logistical systems, such as just-in-time (JIT), than it is for small organizations. These efficiencies can induce mode shifts. For example, JIT systems move organizations away from rail, which is a relatively unreliable service, to more reliable services using trucking and, increasingly, air transportation. Currently there is an automobile factory in Oakville, Ontario, which is in the process of shifting its JIT system from truck to air services and that shift will have environmental effects. The effects will be either negative or positive depending upon the mode that was used and the mode that is being switched to.

NAFTA will also have effects on transportation services through import substitution. For example, if parts are increasingly sourced from within the NAFTA countries rather than from overseas, changes in transportation distances will occur. This will probably have positive environmental effects, in that shorter distances are being traversed within North America rather than overseas. But the impact will not necessarily be positive because, for example, ocean shipping can be environmentally friendly relative to truck transportation.

There are different environmental effects created by different modes of transport. The Canadian Royal Commission on Passenger Transportation has attempted to document the environmental costs of the different modes of transport.

The worst mode of transportation for the environment is rail. In North America almost all passenger trains, except for a few exceptions in the American northeast corridor, are diesel electric locomotives, which pollute at the same rate that they did in the 1950s because there has been no regulatory policy to reduce their emissions. As set out in Figure 5.3, in Canada the train has environmental-social marginal costs of C \$33 per km. For automobiles the cost is C \$24, and for air on the long-haul distances it is C \$20. The bus has an environmental-social cost of only C \$8. Thus, there is a four-to-one difference in environmental impact between the train and the bus. Rail is not environmentally friendly; it may have been in the 1950s, but automobiles have since become cleaner and there has been a 75 percent reduction in emissions in the last generation of jet aircraft. Trains remain heavy producers of nitrous oxides. So the relative positions of different modes of transport in relation to their environmental impacts have changed.

**Figure 5.3
Different Environmental
Effects by Mode**

Canadian Royal Commission on Passenger Transportation
Social Marginal Cost Emission Charges
Halifax to Saskatoon (long haul)

Train	\$33
Car	\$24
Air	\$20
Bus	\$8

Environmental effects also depend on the utilization of transport and the mode as shown in Figure 5.4. There is a big difference, for example, in the environmental impact of a passenger train at current levels of ridership (many passenger trains run almost empty) versus full trains.



**Figure 5.4
Environment Effects and
Utilization (in current or full
occupancy rates)**

No emissions per passenger/kilometre
(grams)

train (current)	1.54
train (full)	.96
automobile	.75
bus (current)	.40
bus (full)	.31
air (current)	.34
air (full)	.23

Another potential effect of trade is that it will tend to substitute transportation for high wage costs. That is, companies now often move parts production into low-wage countries, such as Mexico and even Canada, and will transport their product over longer distances. In so doing, they are substituting transportation costs for production costs. This increases total transportation usage, particularly intra-company transport.

Environmental effects of transportation services will also differ by the distance travelled, as shown in Figure 5.5. For short distances, the car is the least environmentally friendly, with an environmental-social marginal cost of C \$6.80. The train is valued at C \$5.80, air at C \$4.30, and the bus at C \$1.70.

Larger markets allow firms to move to smarter logistical systems, because smarter logistical systems have very high set-up costs. JIT systems are very difficult for many small firms to establish. With smart logistics, information can be used to substitute for inventories. For example, years ago, when Sears had a promotion in its department stores it did not know how successful it was going to be on a particular item. Therefore, it typically stocked a month's worth of inventory for the sale. If Sears has a sale today, it will stock sufficient inventory for only two days.



**Figure 5.5
Different Environmental
Effects by Mode**

Canadian Royal Commission on
Passenger Transportation
Social Marginal Cost Emission Charges
Montreal to Toronto passenger (short
haul)

Car	\$6.80
Train	\$5.80
Air	\$4.30
Bus	\$1.70

Within hours, it can determine how the sale is going throughout its North American stores. It can determine which store is doing well on any particular day, and simply contact the factory as well as deliver additional product as is necessary, often by air. In other stores, where the sale is not going as well, there will be no additional inventory. Ultimately the same number of items get sold. But the more expensive transportation systems, such as rapid-truck or rapid-air transport, may have environmental impacts.

Thus, in the corporate surveys that will be conducted when carrying out this project, firms should be asked about changes in their modes of transport. Has NAFTA induced a move away from rail into trucking, or has NAFTA-induced privatization of the Mexican rail system caused a return to rail? What is the change in the transportation network? In Vancouver, all refrigerators used to come from Montreal (which is like shipping from New York to San Diego) and now they are being brought from Portland and Seattle. Has there been a change in the transportation network? Are the sources closer? Has there been a change in inventory?

Privatization of rail implies increased rail investment. NAFTA will likely induce a merger, consolidation or alliance activity

within the transportation industry, which may have a beneficial environmental effect. This could lead to “rail dis-integration,” the opposite of vertical integration. Investment in Mexico could increase average environmental efficiency as new and more environmentally efficient technology is introduced by the investment process. But there may be a total increase in the consumption of transport services.

Transportation was not included in NAFTA, which liberalized trade but did not liberalize the means by which these trade services will be delivered. The use of transportation of services should not be overlooked, because these industries typically have intensive impacts on the environment. But NAFTA-induced technological change such as the reform of telecommunications facilities may well facilitate the substitution of telecommunications services for air transportation.

Alejandro Villamar Calderón

Mexican Action Network on Free Trade (RMALC)

In the opinion of the Mexican Action Network on Free Trade (*RMALC*), any ongoing assertions that a relationship between trade, the environment and development does not exist is not useful. That relationship, a subject of discussion during the negotiations of NAFTA, has its origins in the global work and conclusions that occurred at, and arose from, the Earth Summit in Rio de Janeiro in 1992. Indeed, the inclusion of the relationship between environment and trade in NAFTA’s environmental side agreement, the NAAEC, which created the CEC, is largely the result of the official recognition of the links between trade, environment and development that occurred at Rio. Nevertheless, there continues to be strong resistance on the part of some groups and government

officials to recognizing this connection. Thus, as part of its official mandate, the CEC has a critical role to play in the vigilant and effective evaluation of the effects of trade on the environment and development.

In discussing the CEC’s NAFTA Effects Project, it is important to consider a number of important points. First, the environment in North America will not only be affected by trade in the strict sense. NAFTA is the official culmination of a process of economic integration between Canada, the United States and Mexico — three very different and asymmetrical economies — that extends beyond trade. NAFTA makes official a process of interaction between asymmetrical national economies as well as an interaction between existing domestic asymmetries. In Mexico, for example, there exist asymmetries with both Canada and the United States, but there are also asymmetries within Mexico among its various regions. Such internal, domestic asymmetries are not exclusive to Mexico. Similar imbalances exist in Canada and in the United States, between various indigenous and minority groups such as African-Americans and Latinos, for example. Asymmetries are also seen in socially marginalized groups such as the indigents of any North American city.

Therefore, the problem in evaluating the effects of NAFTA on the environment is extremely complex. In order to advance this process of assessment, it is worth considering an important theoretical difference. For some, trade is an objective in and of itself, for others — such as *RMALC* — trade is a means for development. Consequently, the focus of an assessment will be different depending on the perspective on trade of the group conducting that assessment. The NAFTA Effects Project should analyze the effects



of trade on development and illustrate how trade interacts with other indicators or dimensions of sustainable development.

It is important to remember that NAFTA is only one free trade agreement. The liberalization of trade and the Mexican economy began in Mexico in 1982 and accelerated when Mexico joined the GATT. As well, trade liberalization is only one element of the process of economic liberalization. Other simultaneous processes exist which create important players under NAFTA that may not be strictly trade related. One such simultaneous process is investment. Therefore, the relationships between investment and, for example, intellectual property, agriculture, or the exploitation of natural resources, should also be evaluated. These simultaneous processes should be included in the NAFTA Effects Project. For example, the monitoring of the investment is a key element in the evaluation process of NAFTA's effects, and by virtue of either its presence or its absence, investment will have an effect on the environment.

Agriculture is an important sector to consider in this context as well, not only in terms of the potential for that sector to have major environmental impacts, but also in terms of its effects on social issues and social stability in the three NAFTA countries. For example, Mexico's weak food production industry will, in one way or another, affect the United States and Canada. Economic asymmetries, and in this case agricultural asymmetries, interact, and thus are important factors to be monitored.

It is also important to take into account that a large number of areas exist where governments can provide exemptions from the enforcement of environmental regulation, in favour of investment

without significant regulation. For example, the border region between the United States and Mexico provides a classic example of a free trade zone where investment without environmental regulation has existed for decades. It is well known that at least US \$10 billion is required to construct environmental infrastructure and to remedy the negative environmental effects of the deregulation in the *maquiladora*. Before the signing of NAFTA, the US Treasury Department and Congress developed a joint evaluation of the border and recognized the problem and the necessity for remediation.

Another example where investment has been criticized for its environmental effects is in the technology sector for industrial retooling and remediation of environmental damage. The present investment policy will determine of future environmental well-being and equilibrium. However, actual levels of investment, and the rules governing investment, are dangerously conditioned by government policy, particularly regulatory policy. This tendency does not appear to be exclusive to Mexico. Some NGOs in Canada and the United States are also observing a silent and insidious deregulation process that could potentially violate the three governments' commitments under NAFTA; particularly Article 1114, which addresses the dismantling and eroding of environmental protection levels to attract investment. There is much discussion surrounding this in Mexico. Many believe the threat exists in recent environmental legislative proposals made by the Mexican government that have been held up by opposition from environment and social organizations. The trend towards deregulation appears to be related to liberalization concepts as applied to trade and investment, as well as the inability of govern-



ments to adequately enforce their own legislation. There appears to be a similar threat in the United States.

Therefore, it is important that an evaluation of the effects of NAFTA on the environment include an assessment of the adequacy of the enforcement of environmental legislation in each of the three countries. Any CEC monitoring program to be conducted must create a much closer alliance with the environmental NGOs in Canada, the United States and Mexico that have begun to look towards problems of monitoring as an indicator of the degree of the enforcement of environmental legislation. In some cases, this view is also shared by some Mexican industrial associations. There also exists some cooperation between NGOs and certain industrial associations in Canada and the United States.

Finally, monitoring principal players is important while evaluating the environmental effects of NAFTA and compliance with environmental legislation. That is,

economic players might employ double standards for environmental compliance in their investment decisions. This would include, for example, Canadian and American industries that may relocate to Mexico, yet do not comply with Mexican environmental laws or regulations, even though they have the financial resources to do so. The classic example is in the *maquiladora* industry in Mexico's northern border region. Since the passage of NAFTA, 75 percent of the businesses that have moved to Mexico are electronic and textile businesses, which the US EPA have catalogued as businesses using very toxic processes, representing high risks for contamination, and in some cases, having a poor record of legal compliance.

Thus, the effect of economic asymmetries must be monitored so as to protect the environment, and promote sustainable development, and to assess the behaviour of the major players as well as the impact of difficult economic times. Large, medium and small players all form part of the whole process of integration of the three countries.



Chapter 6: Integrative Reactions

A MEXICAN PERSPECTIVE

Héctor Márquez Solís

Director General of Analysis and Implementation for International Trade Agreements
Secretariat of Commerce and Industrial Development (*Secofi*)

For the last five or six years throughout the NAFTA negotiations, while working on issues of implementation, many people have asked common and legitimate questions such as: What benefits has NAFTA brought? What have the benefits been for Mexico? What have the costs been? These are simple questions. However, the moment they are asked they become complicated. In order to answer them, a new series of questions must be asked.

From my perspective, NAFTA has many implications. NAFTA has had major or minor repercussions depending on the area.

1. Clearly, the first implications can be observed in the high levels of trade recorded since NAFTA went into effect, as shown by trade statistics.
2. The second important area is in the operation of Mexico's international trade policy. NAFTA is an instrument containing a series of obligations and disciplines in different sectors, as well as liberalization provisions, all of which must be taken into consideration when designing trade policy.
3. NAFTA includes a series of obligations that have implications for Mexico's internal government policy process. It has affected the operation of the government Secretariats, because all

offices were called upon to coordinate amongst themselves to comply with Mexico's obligations. This means, for example, that the Secretariat of Commerce has to be coordinated with the Secretariats of Health, Environment, Communications, and Transport to ensure that the policies developed to fulfill Mexico's obligations under NAFTA are consistent.

4. Another important issue to consider is the benefit of NAFTA to consumers, the modernization and re-orientation of Mexican producers, and the investments that have been made to take advantage of the opportunities afforded by the Agreement.

Taking into account the above, when the question is raised as to what the impact of NAFTA has been, it is clear that the answer is not simple. In trade terms, this determination will at least require knowledge of Mexico's main exports, their levels of trade before and after NAFTA's entry into effect. Subsequently, in products showing an increase in exports, one would look at the change in the rules governing trade in that product in order to determine if the increase in the volume of trade is the result of a provision in NAFTA — or if the increase would have happened anyway.

When answering that question, one must go beyond levels of tariffs. If, prior to NAFTA, a product was subject to a tariff of 1 percent, the impact of eliminating that tariff would not be sufficient to explain a large increase in trade of that product. Additionally, it is difficult to attribute a direct impact in the increase of trade flows, other than a tariff reduction, to any one specific subsection of NAFTA. In other cases, as



in the textile industry, the answer is obvious: prior to NAFTA, there was a system of export quotas to the United States that was eliminated, resulting in an increase in trade. In other areas, however, the causality is not as clear and the explanation probably lies elsewhere, being generated by changes in investment and in intellectual property laws, all of which have created a “favourable environment for business relationships”.

In this analytical process, one must identify relevant variables, the methodology with which to analyze their relationship and the mechanisms through which they interact. The same variables must be applied to investment. The Mexican Government currently maintains a database of new investment in Mexico. The key question to ask is if these new investments were attracted by a specific provision of NAFTA, or whether they were made because the general investment climate is favourable.

The message of this section is that the effects of NAFTA are diverse and that the identification and quantification of these effects on trade and investment require a complicated methodology. The proposed framework for assessing NAFTA effects initially suggests the evaluation of the effects of NAFTA on trade flows, so that in a second phase one may identify the impact of increased trade on the environment. For example, one area where it is suggested that this methodology could be applied is the automotive sector, which has shown large rates of increase in regional trade. Let me briefly explain details of that negotiation.

First, in the United States, the only obligation under NAFTA in the automobile sector is that Mexican automobiles

should meet the standards of CAFE in order to be considered “nationals”. This obligation allows access to Mexican automobiles of the same standards as in the United States. The obligation of Canada with respect to Mexico is that in 15 years, Canada will permit the import of used cars from Mexico. Apart from that, Canada maintains its policy on automotive parts and its programs with previously agreed-on deadlines.

The obligations of Mexico are at the heart of the automobile provisions in NAFTA. Mexico maintains its regulations regarding automobile import, export and plant investment. The negotiation in the automobile sector simply established timeframes to eliminate those regulations over ten years. This is a liberalization program — a gradual opening to the Mexican market over ten years — implemented under the same system, laws and regulations that currently operate in Mexico. The commercial impact of these NAFTA provisions has been to promote the production of automobiles in Mexico and the rationalization of models. The impact is difficult to assess, because answers would be different at Ford, Chrysler, Volkswagen, Nissan, or other national automotive parts manufacturers.

It seems paradoxical that the increase in the automobile sector’s exports was the result of the Mexican market liberalization that allowed producers to rationalize their production in North America. This rationalization can be observed in trade data between the United States and Mexico, which shows that in 1994, the first year of the NAFTA regime, the increase in total trade was similar in both countries. In 1995, the analysis is somewhat more complicated due to the need for separate assessments of the



effects of the peso devaluation and trade liberalization under NAFTA.

This summary description of what was agreed under the NAFTA automotive provisions illustrates how NAFTA has fostered an increase in production in Mexico and in trade with the United States and Canada. For other sectors, the implications for the evolution of trade are largely due to the “favourable environment for the accomplishment of business brought about by NAFTA”, and are not a direct result of a specific provision in the Agreement.

From my point of view, an increase in production and trade does not necessarily imply an effect on the environment. The evaluation of the environmental impact should not be undertaken along with an analysis of NAFTA. In its place, an analysis of the environmental policies of the three countries where production takes place should be initiated, including objectives and practices of institutions in charge of regulation and management of the environment. The work of all institutions and departments involved creates a reference framework under which production and commercial activity can develop both internally as well as externally.

In this way, it would be useful to examine the projects of institutions involved. In Mexico these would be *Semarnap*, *INE*, *Profepa* and all other local and national institutions in charge of implementing environmental policy. Broadening these institutional considerations to include the NADBank, the BECC and the CEC will provide an even better guide to understanding this framework.

A US PERSPECTIVE

Laura Kneale Anderson

*Director, Trade and Environment
Office of the United States Trade
Representative (USTR)*

With the NAFTA Effects Project, the CEC has undertaken an extremely difficult and complicated exercise. At the same time, given the high level of interest on this issue, the results of the study will be closely scrutinized in all three NAFTA countries.

Those who went through the NAFTA process may remember that in 1993, when the US Congress was debating the NAFTA implementing legislation, environmental issues were a significant source of public concern. To respond to these concerns, Ambassador Kantor directed the United States Trade Representative (USTR) to work with other agencies to put together a report on the NAFTA's effects on a range of environmental issues. To be timely, this report had to be produced within six weeks.

The CEC NAFTA Effects study can provide a valuable contribution to the ongoing debate on the relationship between trade and environment. The CEC not only has the luxury of more time to produce its study, but it also can draw upon a broad range of experts on this issue. In my remarks this morning, I would like to make three general comments on the study as a whole, and then seven more specific ones.

1. Who is the audience for this study? It is useful to remind ourselves of the political context in which the debate



over NAFTA and its impacts on the environment took place, particularly in the United States. As the negotiations were getting underway in the early 1990s, there was tremendous public concern about what NAFTA's effects would be on the North American environment. There were three categories of concerns:

- the potential for trade rules to impose restraints on environmental protective measures;
- the potential for increased trade and investment flows to exert downward pressure on national environmental standards; and
- the concern that intensified economic activity could harm the environment, specifically on the US-Mexico border area.

Early in the debate, the US Government reviewed both the environmental issues and concerns that were being raised. It then identified recommendations to the American negotiators as to how these might be addressed, either within the text of NAFTA itself or in some other context. Thus, the government undertook the follow-up study in 1993, which considered the issues and concluded that, overall, NAFTA would have positive effects on the environment.

The report that the CEC is producing should attempt to address the questions that were on the minds of the public and policymakers during the NAFTA debate in 1993. There is a good deal of theory as to what the answers to these questions are but, in many cases, this study represents a unique opportunity to gather empirical evidence as to whether these theories are, in fact, correct. The study should attempt to

respond to such questions as: Is the "pollution haven" hypothesis valid? Do dirty industries migrate, or are pollution control costs generally not so high that these would be a major factor influencing companies to move? Do multinational corporations incorporate the environmental technologies and systems that they use in their home country when they invest abroad? Is there evidence that the *maquiladoras* are moving away from the border? And, if there is, what effect is this having on the border environment? Has NAFTA improved access to state-of-the-art environmental technologies? These are the kinds of questions that were raised during the NAFTA debate, and this report can provide a great service by providing some answers to them.

2. The report should be policy-oriented. The discussion paper refers to a passage in the Rio Declaration noting that responsible economic development and environmental protection are mutually supportive, and then states that this hypothesis has yet to be thoroughly tested. I would recast that statement as follows: trade liberalization and environmental protection can be mutually supportive when accompanied by the appropriate policies, particularly the appropriate environmental policies. There is a tendency in some quarters to assume that the combination of environmental objectives and pursuit of economic growth are, in fact, irreconcilable. The Clinton Administration, in particular, has strongly rejected these kinds of assumptions, believing that trade and environmental policies *should* be compatible. One of the purposes of this report, from the perspective of the American Government, is to help us find ways to make sure that they are.



In that respect, the purpose of this study is not to give NAFTA an overall environmental grade. Aside from the difficult methodological issues that this would raise in trying to isolate the effects of NAFTA from the effects of other factors, this sort of conclusion would not be very useful to policy makers. It is reasonable to expect that NAFTA is going to have positive effects on the environment and negative effects, and the most useful approach is to identify what those effects are. However, it is not terribly useful to talk about net effects. A community that is living in an area where a river is dirty is not helped by the fact that the air is clean somewhere else. What is most useful is to identify the cause of the negative effects, which will then enable the NAFTA governments, working with the CEC, to try to find ways to address those effects.

3. Public dialogue is critically important as this report proceeds. To this end, it is very important to remember who the audience is. In some respects, the audience is the three NAFTA governments but, in another very important respect, the audience includes every person in the three NAFTA countries who cares about trade liberalization and about protecting the environment. These individuals have made, and should continue to make, a valuable contribution to this study.

I will now address specific comments on the report.

1. Perhaps the most important specific comment is that it is important that the report be balanced. There are two aspects to this. First, while there are a number of environmental issues in Mexico, it is important to recognize that there are also environmental

issues in Canada and in the United States. This report should not become a report on the state of the environment in Mexico. Second, while it is appropriate to consider the pollution impact of sectors whose trade has increased as a result of NAFTA, it is important to avoid an oversimplified analysis, along the following lines: NAFTA creates more trade; therefore, NAFTA creates more production; more production creates more pollution; therefore NAFTA pollutes the environment. There is certainly an extent to which this occurs, but there are also a number of offsetting factors that can be harder to measure, such as efficiency increases, technological improvements, diversification in investment location and increases in the resources available for environmental protection.

2. In looking at offsetting positive environmental effects, one difficult-to-measure but very important effect of NAFTA was the creation of the CEC, the BECC and the NADBank. The most immediate environmental benefit from NAFTA may be less in improving the state of the environment than in improving the three governments' ability to work together to protect the environment. The CEC is doing a lot of good work already which it would be useful for the study to recognize.
3. The issue of pollution intensity indicators is important. It is a good idea not to rely on assumed pollution intensity indicators, because this will be a critical element of the analysis in determining some of NAFTA's environmental effects. In that respect, a more general comment is that, where assumptions are made, they should be supported by facts.



4. The study will probably be most useful and will produce the most interesting results where it tries to focus on specific issues rather than trying to get a handle on the overall picture. In this respect, some of the study's most interesting work may come from the sectoral analyses. Certainly there may be some value in examining all three of the sectors identified to date (energy and petrochemicals, automotive products and forest products). However, these three sectors seem to have been chosen on the basis of their significant trade impact. The study should also look at sectors that might not be quite as significant in trade terms, but which may have the potential for significant environmental effects, such as trade in environmental technologies and services, trade in hazardous wastes, and trade in chemicals.

5. I noted that one part of the working document that was particularly useful was a survey of individual firms. This should be an important part of the study. One can only accomplish so much with modelling exercises. To the extent that CEC is able to pursue interviews with individual firms, this will provide a more accurate picture of what is really going on.

6. My sixth comment concerns the impact of each country's environmental policies. The preliminary report refers to some effects from Mexico's accelerated depreciation program for anti-pollution equipment. While this program cannot be attributed to NAFTA, it does have environmental effects. This highlights the fact that it is important to recognize that NAFTA is essentially a way of changing economic incentives. NAFTA is not an environmental document. The way that firms and

individuals respond to these economic incentives takes place in a framework of environmental regulations that is defined by each of the three governments. Thus, it is important to avoid attributing results from particular environmental regulations to NAFTA *per se*.

7. Finally, with respect to causality, in determining how firms and individuals respond to the economic incentives of NAFTA, there is a certain logic in attributing some causality to the changes in economic incentives brought about by NAFTA. It makes less sense to talk about how governments respond to NAFTA or to ask such questions as whether or not the increase in the number of Mexico's enforcement actions was attributable to NAFTA. It does not make sense to try to link particular government actions to NAFTA itself, since a government may take a particular action for many different reasons. Instead, government actions should be considered in the framework in which the economic reactions to NAFTA will occur.

A CANADIAN PERSPECTIVE

Peter Fawcett

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International Trade (DFAIT), Canada*

In Canada, the main debate over free trade occurred in relation to the negotiation of the 1988 FTA. There are still those in Canada interested in NAFTA, but the enthusiasm expressed in this meeting certainly shows that there is a high level of sustained interest in both the United States and Mexico.



The institutional context of this project is important to bear in mind. New institutions are being created. They are not United Nations' (UN) institutions; they are not bilateral institutions. They are trilateral institutions, and it is very important that they are created in a way that is appropriate to reflect the interests of the three countries. Nevertheless, the perspective from a multilateral front is also important to bring to this study. There is a great deal of international interest in NAFTA. Indeed, NAFTA is currently the subject of a WTO review. There is certainly ongoing discussion in many international fora about the potential impact of NAFTA, and this study will not go unnoticed internationally.

Determining the work of the over 30 committees and working groups that were established under NAFTA is important work. In Canada, whenever possible, reports of these committees and working groups have been put on a World Wide Web (WWW) site on the Internet. Soon there will be a fifth NAFTA institution, the NAFTA Coordinating Secretariat, which will be located in Mexico City and will coordinate the work of the various committees and working groups. It will support the Free Trade Commission, the body established for the three trade ministers, and it should provide a good database for developments and the further implementation and elaboration of the Agreement.

This project presents challenges related to the collection of data. First, there have been some concerns about working with trade data. Much of the trade in North America is conducted within firms — and certainly within industries — and it can be difficult to use that data. Anyone looking at that trade data should not rely only on monthly or quarterly data, because the simple transfer of inventory by a firm

like General Motors can significantly influence the trade in the short term. Annual data is what should be examined.

There is also a problem with the Canadian export data. In the FTA, the two countries agreed to accept each other's import statistics. As a result, Canadian export statistics that enter the United States for transshipment into Mexico, appear in the first instance as American imports, and then as American exports into Mexico. So there is a significant underestimation of Canadian exports destined to Mexico. The statistical agencies from the three countries are attempting to solve this. Another problem with the data relates to service exports which are, in effect, being completely redefined.

Similarly, it is very difficult to come up with reliable investment statistics within NAFTA. As a general rule, trends and directions should be examined rather than the specifics of some of the data.

Clearly there will also be difficulties related to causality in this study. In part, this is due to the fact that the data sets will often not reflect the realities accurately enough to make scientific findings of causality. But it is also because as the North American economy becomes more integrated, it will become more and more difficult to isolate the effects of individual events and factors. As governments attempt to integrate environmental concerns into policy formulation, the cause and effect will not be immediately evident. But that will have a positive impact on policy formulation within the three governments. This study should be policy oriented, and there must be limits to it. Examining causal relationships, trends and directions would be useful without attempting to prove strict causality.



The study should also move quickly into its next phase, to examine specific sectors. There are a number of sectors where further work would be useful, including agriculture and rural development, and transportation. Transportation is an important sector to look at in terms of its environmental impact because these impacts are not always obvious.

In March 1996, the OECD held a sustainable transportation conference in Vancouver. It considered a number of these impacts and established principles for sustainable transportation that hopefully will gain some international support. A number of speakers in Vancouver indicated that in the NAFTA context there may be reduced transportation services in Canada in terms of east-west movement and more transportation services north-south. This has environmental implications in the United States. Thus, a broad range of sectors should be considered, and the impacts in these sectors beyond Mexico and the border area should be examined.

The OECD also reviews the environmental policies of its member countries. There are positive benefits from such environmental reviews, certainly in terms of putting the state of the environment in an international context and increasing awareness about environmental issues within one's own country. Indeed, the

OECD framework for looking at the environmental impacts of trade agreements may well be appropriate for this study.

There are discussions going on in other fora that will have some bearing on the work being conducted by the CEC. Certainly the WTO Committee on Trade and Environment is doing some interesting work. Ecolabelling and the trade provisions of multilateral environmental agreements are the two priority items, but there is other work underway in the committees on intellectual property, services, and eco-taxes, that would be of interest and relevance to this study. The WTO's study on the environmental benefits of trade liberalization related to the Uruguay Round is still in the process of being completed. In September 1995, the WTO brought forward an interim report. Although it remains work-in-progress, it has some relevance to this study.

Finally, the World Bank has recently produced a study on the wealth of nations. It includes measures on environmental protection, on cultural resources and on investment in human resources. The report suggests that generally speaking, the world should not be looking at only the traditional measures of wealth and economic development, but also those measures related to sustainable development.



INSTITUTE OF THE AMERICAS (IOA)

Paul H. Boeker

President, Institute of the Americas

It is clear that the link between environment and trade is here to stay. The ever-increasing availability of soft data on this link can be dangerous because many, including those interested in protecting industry, have an interest in moving quickly from soft data to conclusions.

Therefore, this study should move forward with caution and conservatism. Conservatism should be practised in assessing the data, in its use, and in the conclusions that can be extracted from it. This is particularly important when considering the cause and effect relationships created between NAFTA and the environment. It may not be possible or even desirable to reap profound policy conclusions at this point in the study. The drawing of any policy conclusions should come at the end, when and if the analysis and data clearly warrant this. However, there are some excellent people working on this study and if the quality of the analysis continues, it can make a significant contribution.

The scope and focus of the discussion paper is primarily on economics. The demand for environmental protection is essentially a political process driven by enhanced public awareness and enhanced resources for protecting the environment, beginning with rising per capita incomes. Among the main effects of the political processes establishing NAFTA have been the increased awareness of environmental problems in North America, and increased political action to deal with it both within and among the member countries. The CEC is a clear and direct

effect of this process engendered by NAFTA, and holds out great promise for conducting serious and influential work in the study and protection of the North American environment. The IOA is very pleased to have been part of this process.

THE COLLEGE OF MEXICO

Andrés Lira González

President, The College of Mexico

The issues that have been discussed at this workshop such as trade liberalization and the international relationships in the economic and environmental sectors are issues that have a long history and have preoccupied policy makers for a long time. The main issue for consideration in this project is NAFTA and its potential effects on the environment. There is no doubt that the study will be of great benefit to all of us because those who can see the increased scope of environmental problems in North America see them getting visibly worse. Clearly, this issue demands our permanent attention and this workshop will help move the issues forward.

The objective of this meeting, to define a framework so as to evaluate the effects of NAFTA on the environment has been achieved. However, we must continue working on the framework so that it can produce the required results.

There are many issues that could enrich this continuous reflection and there have been many suggestions made today. Rather than detail specific items, suffice it to say that it is extremely important to underline the establishment of an ongoing process that serves an increasing audience in North America through many different means of communication.



Conclusions from the Chair

Pierre-Marc Johnson

Chair, Workshop on Building a Framework for Assessing NAFTA Environmental Effects

This workshop had three critical objectives. The first was to solicit feedback, both formally and informally, on the work that has been done and that is presented in the discussion paper, with a view to refining and confirming the main characteristics of the framework for this study. The second objective was to assist the CEC to define priorities for the next two to three years of this project. And the third objective was to inform interested individuals and groups about the steps the CEC is taking to fulfill its mandate to assess the effects of NAFTA on the environment. The group gathered here has fulfilled these objectives extremely well. A number of substantive points have been raised for the CEC to consider as it designs the next phase of this project.

1. First, there is clearly a concern about flexibility when discussing causality. Both the NAFTA and the NAAEC refer to sustainable development. Sustainable development refers to the ecological, economic, social, cultural and political dimensions of environment and development, in both their biophysical and their human aspects. NAFTA enters into the equation from an economic perspective, primarily with its consequential effects upon trade and economic growth. But the reference to sustainable development broadens its scope considerably.

In undertaking this project, the challenge for the CEC is to generate a study that is broad enough in scope to be both interesting and relevant, while at the same time, focused enough to be significant and conclusive. It is also very important that the study be

closely aligned with the restrictions imposed upon the CEC in executing its mandate. This workshop has served as a mechanism for the CEC to consider, and perhaps test, the limits of what it is mandated to do.

2. A second issue that was raised is that of balance in the framework being elaborated. This includes balance in geography between all areas in the NAFTA region, which is a fundamental consideration. It also includes balance in the analysis between increased pollution and so-called environmental efficiencies, which can be associated with increased trade stemming from NAFTA itself. A third consideration of balance is economic and industrial activities on the one hand, and human dimensions on the other. The scope of this study might possibly integrate a broader analysis that considers human behaviour as it is affected either by NAFTA, or NAFTA-driven processes, such as the effect of trade liberalization on sustainable human settlements and communities that act as environmental-care providers, or stewards.
3. A third issue is the importance of institutions. The CEC has to consider cooperation among our three countries in the medium and long term, something that politicians with shorter timeframes cannot always do. The Commission has an important role to play in deepening the institutional processes which are new to this continent and yet fundamental to the progress and cooperation amongst North Americans.
4. Fourth, while it is important that this study not re-invent the wheel, environmental health, land use, social consequences of land use and lifecycle analysis are issues that should be



considered. The discussion paper should at least refer to these issues, although they may not explore them deeply for structural reasons.

5. One final issue that should be kept in mind during this study is the issue of incrementalism. There is enormous value to the development of the slow and ongoing improvement of the environment as well as ongoing improvement of the quality and the depth of the cooperation between and among

the three NAFTA countries and their citizens. Some consideration as to how this cooperation can lead to improvement in the lives and the environment of North Americans would be a meaningful exercise.

The critique offered at this workshop was extremely solid, energetic and constructive. It will no doubt be very useful to the CEC and all those individuals associated with this project.



Major Issues and Themes

Sarah Richardson

Program Manager
NAFTA/Environment, CEC

The following is a summary of ten key themes that emerged from the Commission for Environmental Cooperation's (CEC) workshop "Building a Framework for Assessing NAFTA Environmental Effects".

1. Importance

A number of individuals supported the CEC's role in undertaking the NAFTA Effects Project and designing a study by which to assess these effects. Participants noted that the CEC has a clear mandate to do so. Many expressed that it was, and continues to be, a legitimate source of concern for governments and others who want to know exactly what the implications of NAFTA — and the processes and institutions that it established — actually are on the environment.

To that end, this study presents a unique opportunity to gather empirical evidence to test the many and varied theories advanced with respect to NAFTA and to attempt to respond to the questions that were raised during the negotiations. The study of NAFTA's environmental effects demonstrates not only that this trilateral agreement can bring about new forms of international cooperation. But it also provides an opportunity to use the North American region as a case study to examine issues that are extremely complex and often outside the mandates or workplans of other international organizations.

The study will be closely scrutinized by a number of constituencies in all three NAFTA countries and beyond North America. The CEC was reminded that there is a great deal of interest in NAFTA

internationally and in its environmental implications. For example, NAFTA is currently the subject of review in the WTO. Therefore, the NAFTA Effects Project will not go unnoticed internationally, and the CEC should regard this attention as an opportunity to advance important work. The work should be credible and systematic. Indeed, the NAFTA Effects Project presents the opportunity to develop new and important findings that may be applicable to other regional arrangements such as *Mercosur* and the European Union.

2. Balance

The effects of NAFTA will be felt throughout North America. There were a number of general comments suggesting that the discussion paper and the presentations at the workshop tended to focus too heavily on Mexico. Although Mexico is important, it should not become a case study for this project. There are important environmental issues, as well as significant and important effects in Canada and the United States in relation to NAFTA.

The US-Mexico border region was highlighted as a critical area for consideration as a separate geographic entity along with the three NAFTA countries. The implications on the environment of the shifts in the structure of the border economy and the *maquiladoras* since NAFTA was recommended as one area for study. For example, in 1995, 465 new *maquiladoras* were established and 59 percent of them were not along the border, but in the interior of Mexico. Also, increased sales of goods from *maquiladoras* are remaining in Mexico as opposed to being shipped back to the United States. This could have impacts on cross-border traffic as might increasing *maquiladora* exports to Europe and Latin America.



3. Causation

A number of participants raised the difficulty of showing clear cause-and-effect relationships in this study. For a variety of reasons, some expressed the concern that strict scientific causation would be almost impossible to prove. First, the data does not support strong findings of causality. Second, there are a number of impacts of trade liberalization beyond NAFTA and it is difficult to separate the impact of NAFTA from those of the GATT and from general globalization and competitiveness issues. Third, as the North American economy becomes more integrated, it becomes increasingly difficult to isolate individual events and factors as causes of environmental degradation or improvement, particularly as governments attempt to integrate environmental concerns into policy formulation. In particular, in determining how firms and individuals respond to the economic incentives of NAFTA, there may be some logic to attributing some level of causality to those changes in economic incentives. But it makes less sense to talk about how governments respond to the NAFTA and attempt to make links of causality with respect to policy changes.

There was a suggestion that, instead of attempting to prove strict causality, the project team(s) look for “causal relationships”, patterns and directions that make sense with respect to the linkages between trade and the environment.

4. Policy Relevance

A number of participants suggested that it would be useful for the study to focus very squarely on the policy matters that were of concern to the negotiators and policy makers at the time that NAFTA was negotiated. That is, the study would

be doing a service if it attempted to answer questions such as: Is the pollution haven hypothesis valid? Do dirty industries migrate? Are *maquiladoras* moving away from the border? Has the NAFTA improved access to a “clean field” and state-of-the-art environmental technologies?

The recent publication by Public Citizen, entitled *NAFTA's Broken Promises: The Border Betrayed NAFTA's Environmental Effects* (January 1996), indicates that there is continuing and sustained interest in NAFTA's environmental effects. Thus, it is important that the NAFTA Effects Project carefully consider the questions posed above and produce an objective and balanced study, in order to contribute to the policy debate in the future.

NAFTA is a dynamic process. It has changed the organization of social, economic and environmental boundaries in North America. Thus, it is natural for the governments to assess the consequences of the process. Indeed, the exercise of assessment is an important one, not only for the governments. Assessment is also an essential element for building public constituencies.

5. Breadth

Another issue that was raised repeatedly at the workshop was the issue of the breadth and scope of the project, not only in terms of issues, but within issues. In an attempt to be comprehensive, it was suggested that the study pose questions and test theories designed to assess the environmental implications of NAFTA as rigorously as possible.

A focus on the mechanics of change, as opposed to a snapshot of indicators, was proposed. Also requested was the consideration of a lifecycle analysis, to understand how different effects take place at different



states throughout the lifecycle. A balance between potentially positive and negative effects was stressed. A number of individuals also suggested that the study include issues such as NAFTA's impact on efficiency as it affects the environment, technological improvements, diversification and investment location, and the resources available for environmental protection. A number of individuals also suggested that the study include indicators of human health.

6. Importance of Rule Changes and the Institutional Context

The importance of institutions and their future role in NAFTA was a recurring theme throughout the workshop. Participants considered the institutional framework of NAFTA as the element likely to have the most influence in terms of its environmental effects, as well as for the management of those environmental effects by the three countries both individually and collectively.

Because the importance of the US-Mexico border region was highlighted as critical for this study, a number of participants suggested that the CEC consider the BECC and the NADBank as being within the scope of the project, even though they are not formally linked to NAFTA but are indirect outgrowths of the NAFTA process. A number of participants suggested that the BECC and the NADBank, along with the CEC, are integral parts of the NAFTA process. This is because without that process, they would not have been created and, without the environmental institutions, NAFTA may not have been passed when it was. Therefore, the border institutions are linked integrally to the NAFTA regime. They are an essential element of the environmental rule changes for consideration of new procedures and processes

when making environmental decisions among the three countries of North America. The creation of the CEC, the BECC and the NADBank was put forward as perhaps the most immediate environmental benefit from NAFTA, certainly in their ability to improve communications and encourage the three countries to work together to protect the North American environment. Taken together, the CEC, the BECC and the NADBank are considered to have the potential to make substantive contributions to the mitigation of environmental effects in the three NAFTA countries.

7. Focus on the Environment First

A number of participants at the workshop suggested that the starting point for analysis under the NAFTA Effects Project should be the environmental dimensions of the relationships between the three NAFTA countries. That is, while the economic analysis is very important for the study, it would be valuable to first determine what the state of the environment is, determine what the effects of NAFTA may be, and then incorporate the economic analysis into the study, rather than use the economic analysis as a point of departure.

However, there were also cautionary voices urging the CEC not to lose sight of the trade element of the project. NAFTA is a trade agreement, not an environmental agreement, and in order to ensure that the study is a manageable undertaking, some people emphasized the need for it to have clear parameters. The point was made that there is a lot of independent work being done on the environment in North America by the CEC and others that could overshadow the trade analysis, whereas there is little if any work being done on the impact of NAFTA on the environment.



8. Migration and Land Degradation

Some individuals at the workshop noted the importance of the relationship between land degradation and NAFTA. This would include, for example, the link between land degradation and new agricultural practices that may have been induced by NAFTA and migration from the rural dryland areas into urban centres. There are projections that this migration will increase under NAFTA, putting tremendous pressure on the urban infrastructure, particularly in Mexico. The environmental impacts of population growth, consumption, enforced migration, the abandonment of rural areas, and increased poverty may well be significant.

9. Communities and Social Actors

There were a number of concerns raised about the need to focus on specific social groups, not only on economic sectors, to determine in particular whether specific groups that interact in sensitive ways with the environment have been affected by NAFTA. This is related to the issues of rural dislocation, as there may be environmental implications stimulated by the dislocation of communities that have provided environmental stewardship on a given piece of land for hundreds of years. In this context, it was suggested that there be some discussion of the role of indigenous communities. Other groups considered by the NAFTA Effects Project should extend beyond environmental NGOs to include local authorities, parliamentarians and the business communities in the three NAFTA countries.

10. Sectors

There was strong general support for the study to move quickly to consider selected sectors for more detailed examination.

Many participants noted that an analysis of specific sectors and issues would be very useful, and would produce interesting results. Given the difficulty of establishing clear cause-effect relationships, the analysis of specific environmental issues within the context of economic sectors that have been affected by NAFTA, will assist in tracing patterns and developing relationships between trade and the environment. A cautionary note was expressed warning that the NAFTA Effects Project should not look only at manufacturing sectors, for that might risk biasing the study towards negative findings.

In selecting sectors, a number of participants suggested that the CEC should not simply pick those sectors that have experienced the largest changes in trade or investment as a result of NAFTA. Rather, participants suggested that sectors could be selected based upon their potential impact on the environment. For example, transportation equipment should not be selected unless it included emissions, because the production of automobiles is not a major source of pollutants. Similarly, sectors such as trade in environmental technologies and services, or trade in hazardous wastes and chemicals were noted as having the potential for significant environmental effects.

Given the focus on land degradation, a number of participants suggested that agriculture and rural development would be a rich sector for study. Other sectors that were highlighted were refining, energy and electricity generation, and petrochemicals, all of which are perceived to have important implications for the environment.

Transportation and its infrastructure was considered to be an essential issue for examination and analysis. It was cited as



a major contributor to air quality, with direct linkages to trade through the movement of goods, as well as indirect linkages through the effects of privatizations in the transportation sectors. Transportation mode shifts have the potential to create significant environmental effects. Depending on which forms of transportation are adopted, it can have positive

or negative environmental effects. A sector study could focus on transportation infrastructure and the way that services are delivered. The automotive sector was considered important from the perspective of emissions, as well as by virtue of the dramatic increases in trade from Mexico to the US in automobiles and automotive parts.



Appendix A: NAFTA Effects Project Team (Phase I)

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NAFTA Effects, Project Team Leader

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Profesor e Investigador
Centro de Investigación y Docencia
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Virginia Maclaren

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Rogelio Ramírez de la O.

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Sidney Weintraub

William E. Simon Chair of
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Centre for Strategic and
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David Wilk Graber

Director General
WG Consultores y Asociados,
S.A. de C.V.



Appendix B: Agenda

Monday, April 29, 1996

<p>8:00 Coffee</p> <p>8:45 Introductions Pierre-Marc Johnson <i>Vice Chair, National Round Table on the Environment and the Economy (NRTEE)</i> <i>Chair, NAFTA Effects Advisory Group</i></p> <p>Paul H. Boeker <i>President, Institute of the Americas (IOA)</i> Andrés Lira González <i>President, El Colegio de México</i></p> <p>9:00 The Institutional Context Chair: Victor Lichtinger Executive Director Commission for Environmental Cooperation (CEC) Alfredo Phillips Olmedo <i>Executive Director, North American Development Bank (NADBank)</i> Jorge Bustamante <i>Chairman of the Board of Directors, Border Environment Cooperation Commission (BECC)</i> <i>Member, CEC's Joint Public Advisory Committee (JPAC)</i></p> <p>9:45 Project Overview and the NAFTA's Rule Changes and Institutions John Kirton <i>NAFTA Effects Project Team Leader, University of Toronto</i> <i>Discussants:</i> Economic Rule Changes and Institutions Leonard Waverman <i>Director, Centre for International Studies</i> <i>University of Toronto</i> Environmental Rule Changes and Institutions</p>	<p>Sanford Gaines <i>University of Houston Law Center</i> A Mexican Perspective Hector Márquez Solís <i>Director General of Analysis and Implementation for International Trade Agreements, Secretariat of Commerce and Industrial Development (Secofi)</i></p> <p>11:00 Coffee</p> <p>11:15 NAFTA's Trade and Investment Effects Chair: Colleen Morton <i>Vice President, Institute of the Americas</i> Sidney Weintraub <i>Center for Strategic and International Studies</i> Rogelio Ramírez de la O. <i>Director General, Ecanal S.A. de C.V.</i> <i>Discussants:</i> Juliet Bender <i>Acting Director, Office of the NAFTA</i> <i>US Department of Commerce</i> Leonard Waverman <i>Director, Centre for International Studies</i> <i>University of Toronto</i> Adalberto García Rocha <i>El Colegio de México</i></p> <p>1:15 Lunch</p> <p>2:00 NAFTA's Environmental Dimensions Chair: Richard Kamp <i>Director, Border Ecology Project</i> <i>Member, NAFTA Effects Advisory Group</i> Framework, Variables and Indicators Omar Masera <i>Universidad Nacional Autónoma de México (UNAM)</i></p>
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Virginia Maclaren
University of Toronto
 Discussants:
 Adrián Fernández Bremauntz
Director General, Management of Environmental Information, Instituto Nacional de Ecología
 Ian Rutherford
Director General, State of the Environment Environment Canada
 William Eichbaum
Vice President, US Program World Wildlife Fund (WWF)

Discussants:
 Robert Morris
Senior Vice President, US Council on International Business
 Michael Tretheway
Faculty of Commerce and Business Administration The University of British Columbia
 Alejandro Villamar Calderón
Red Mexicana de Acción Frente al Libre Comercio (RMALC)

4:15 General Discussion

5:15 Summary Remarks

5:30 Reception
 Welcoming Remarks:
 Douglas Wheeler
California Secretary for Resources

10:45 Coffee

11:00 Integrative Reactions
 Chair: Mary Kelly
Director, Texas Centre for Policy Studies
Chair, National Advisory Committee (US)
 Laura Kneale Anderson
Director for Trade and Environment Office of the US Trade Representative
 Peter Fawcett
Deputy Director, Environment Division
Department of Foreign Affairs and International Trade (DFAIT), Canada

Tuesday, April 30, 1996

8:15 Coffee

8:45 Connecting Economic Processes with Environmental Effects
 Chair: Jonathan Plaut

Former Director, Environmental Quality Allied Signal Inc.
Chair, CEC Joint Public Advisory Committee (JPAC)
 Central Connecting Processes: Production, Technology, Transportation, Society and Policy
 John Kirton
NAFTA Effects Project Team Leader, University of Toronto
 Raúl García Barrios
Centro de Investigación y Docencia Económicas (CIDE)
 David Wilk Graber
Director General, WG Consultores y Asociados, S.A. de C.V.

12:30 Closing Remarks
 Paul Boeker
President, Institute of the Americas (IOA)
 Andrés Lira González
President, El Colegio de México
 Pierre-Marc Johnson
Vice Chair, National Round Table on the Environment and the Economy (NRTEE)
Chair, NAFTA Effects Advisory Group

Note: All panels will include opportunities for discussion from the floor.



Appendix C: Discussion Paper

BUILDING A FRAMEWORK FOR ASSESSING NAFTA EFFECTS

I. Introduction

The North American Free Trade Agreement (NAFTA), its accompanying North American Agreement on Environmental Cooperation (NAAEC) and the Commission for Environmental Cooperation (CEC), arrived amidst high hopes for a substantial, rapid and widespread improvement in environmental quality throughout the new North American community. Today, more than two years after NAFTA came into effect, these hopes are still in the process of being realized.

The NAFTA regime itself, and the trade and investment flows it creates and stabilizes, will affect the natural environment through many complex processes of collective human activity: economic, technological, institutional, social, demographic, political, psychological and ethical. NAFTA-induced activity may stimulate the adoption of new environmental standards, encourage investment, correct market and institutional distortions, improve the quality of agricultural practices and residue management systems, increase efficiency in the use of energy and resources, and reduce the pressure of a low-income population on fragile ecosystems by creating employment opportunities and increasing welfare. It may further encourage open social, environmental and political processes, rather than closed and protective ones.

However, processes triggered by the activity induced or displaced by NAFTA may also result in a host of results: increased pollution; alteration of vegetation types, agrosystems and cultural landscapes; the degradation or impairment of local or regional bio-geophysical cycles, food chains, and species interactions; and

changes in the composition and dynamics of biotic communities. The result could be the reduction and loss of important genetic variability, populations and/or species.

As this study proceeds, it will become apparent that not all of the environmental changes experienced by North Americans since January 1, 1994 can be traced to NAFTA, as important as that Agreement has been in redefining the way economic, social and political life unfolds on the continent. Yet it is vital to identify what particular environmental consequences the NAFTA rules, institutions, and processes have had, if only to address concerns and identify ways in which the NAFTA regime can operate in an ecologically supportive way in the future. The current challenge is to design a framework in which the particular environmental consequences flowing from NAFTA can be identified.

This discussion paper highlights the main elements of the work conducted over the past five months by the NAFTA Effects Project Team. As the culmination of the first phase of a multi-year project, it proposes the essential elements of such a framework: the key variables to be included; the major relationships to be assessed; the appropriate indicators; and the availability and quality of relevant data. It also includes proposals for future analytic work. This paper is thus intended as the foundation for an ongoing, open dialogue, to which the CEC's many stakeholders can make a full and continuing contribution. Thus at this preliminary stage, it does not report firm findings about NAFTA's economic or environmental effects, nor present a finished model or fully elaborated analytic framework or design. Indeed, what is required at present is a steadily developing understanding of these complex dynamics, rather than a premature rush to judgement.



1. The Analytic Challenge

This study suggests somewhat of a departure from the dominant approaches to the study of trade-environment relationships in the academic and policy realms.¹ In the academic world, the central approach to assessing the affects of trade, trade liberalization, and prospective trade liberalization agreements on the environment has been the use of computable, general equilibrium models. In the policy world, the primary work of relevance has been the framework developed by the Trade and Environment Committee of the Organization for Economic Cooperation and Development (OECD) and work currently underway at the United Nations Environment Program (UNEP).

This paper will not recommend a primary reliance on a computable general equilibrium or related formal, mathematically-expressed model as the primary framework for assessing the environmental effects of NAFTA.² To secure their promised payoffs, such models require a consensus over relevant and priority variables and relationships, as well as the availability of precise, high quality, cross-nationally-comparable data that in important instances do not exist within the NAFTA area. Even with robust CEC support, these tasks will take considerable time and resources to complete at an acceptable level. Any formal, mathematically-based

model would tend to exclude *a priori* critical aspects of the NAFTA regime, and emerging and future dimensions of economic and ecological activity. It would also exclude the often anecdotal or qualitative evidence that at present constitutes the only data on key factors. Finally, the particular policy responsibilities and constituencies of the CEC suggest the development of a framework should be based less on general flows expressed at a high level of abstraction, than on one grounded more closely in concrete and easily comprehensible empirical activity. The latter should be focused as much as possible on the actors — the decision making units in the corporate, government and community sectors — as on the disembodied economic or ecological transactions among them.

Nor will this paper offer a direct application to the NAFTA area of the important framework developed by the OECD.³ The OECD work has the advantage of being importantly shaped by the NAFTA parties, and commands the support of a large number and broad range of OECD member countries. It focuses on the critical four dimensions of product, scale, structural and regulatory effects, all being dimensions that are included in this current study, if in a different way. However, the OECD framework does not have as its central purpose and starting point the assessment of specific trade-investment-economic liberalization agreements such

¹ For an overview and assessment see: Commission for Environmental Cooperation. *NAFTA Effects, A Survey of Recent Attempts to Model the Environmental Effects of Trade: An Overview and Selected Sources*, November, 1995.

² Some of the limitations of such models are discussed in Timothy Kehoe, "Assessing the Economic Impact of North American Free Trade," pp.3-29, in M. Delal Baer and Sidney Weintraub, *The NAFTA Debate: Grappling with Unconventional Trade Issues*. (Boulder: Lynne Rienner, 1994).

³ OECD. *Methodologies for Environmental and Trade Reviews*, Organization for Economic Cooperation and Development, Paris, 1994. See also the work of the United Nations Environment Program (UNEP), most recently UNEP, Environment and Trade, Environment and Economics Unit, *Report of UNEP Ad Hoc Experts Workshop on Environmental Assessments of Trade Policy*, New York, 22-23 March, 1995.



as NAFTA. Nor does it possess the distinctive economic and ecological concerns of the NAFTA area, accompanied by the unique responsibilities of the CEC.

The proposed framework both builds on and hopes to contribute to the existing studies completed, currently underway, or scheduled to begin, within the governments and research communities of the three NAFTA countries.⁴ More than two years after NAFTA began operation, there is still no single comprehensive analysis of the effects which the NAFTA's distinctive changes have had on the economic and environmental flows among, and performance within, the three NAFTA countries. Yet several recently published studies begin to address components of these effects. And at least one comprehensive analysis of the NAFTA's effects on the United States' economy and environment is due to be issued in 1997. Taken together, these studies have the advantage of taking the realized (rather than prospective) NAFTA as their starting point, and proceeding to assess impacts on the basis of evidence from the post-NAFTA period. They are, however, an almost entirely American-produced, and still partial literature.

2. The General Framework

The NAFTA Effects framework being developed here seeks to meet several

criteria, notably an approach that is balanced, comprehensive, causal, concrete and policy-oriented.

2.1 Balanced. Whatever the overall net impact at a particular stage, NAFTA will have both beneficial and harmful environmental consequences. The mandate is to design a framework, not that can aggregate widely-varying dimensions to produce an overall score, but to identify specific areas of advance and decline, so that progress can be reinforced and corrective action taken. In so doing, the framework should take full account of the central message of the Rio Declaration, embraced by all three NAFTA parties. It stated that responsible economic development and environmental enhancement can and should be mutually supportive. Indeed, the very core of NAFTA, with its environmental side agreement expresses that ideal.

Moreover, differences in the economic size and levels of development of the three participating countries, combined with the existence of the 1989 Canada-US Free Trade Agreement (FTA), mean that the direct and immediate economic and environmental adjustments flowing uniquely from NAFTA will be experienced most heavily and directly by Mexico.

⁴ See most prominently: 1) United States Department of Agriculture, Economic Research Service, *NAFTA: An Early Assessment*, a Report by the NAFTA Economic Monitoring Taskforce, October 1994, Spring 1995, Autumn 1995; 2) American Government, Department of Commerce, International Trade Administration, *Impact of the North American Free Trade Agreement on US Automotive Exports to Mexico, 1995*; 3) United States Agency for International Development, Bureau for Global Programs, Field Support and Research Centre for the Environment, *Mexico's Environmental Markets*, Business Focus Series, March 1995; 4) United States Department of Commerce, Trade Promotion Coordinating Committee Environmental Trade Working Group, *Mexico: Environmental Technologies Export Market Plan*, October 1994; 5) Public Citizen, *NAFTA's Broken Promises*, Washington DC, September 1995; Public Citizen, *NAFTA's Environmental Effects*, Washington DC, January 1996; 6) Good Neighbour Environmental Board (An Advisory Committee on the US-Mexican Border on Environmental and Infrastructure Issues), *First Annual Report*, October 1995; 7) Further to a mandate as cited in United States, House of Representatives, 103rd Congress, 1st Session, Rept. 103-361, Part 1, *North American Free Trade Agreement Implementation Act*, November 15, 1993, pp. 97-98, the American President is required to provide Congress with a "comprehensive study on the operation and effects of the NAFTA" by July 1997.



But because the NAFTA-induced trade and investment will affect the connected economy and “shadow ecology”,⁵ or ecological footprint in the United States and Canada, especially as a NAFTA-wide integrated production system develops, it is important to include the activities and concerns of all three of NAFTA’s members.

2.2 Comprehensive. The framework should embrace the NAFTA regime in its political, legal, policy and institutional dimensions. It should examine the ways in which — and times at which — the NAFTA regime exerts an influence on subsequent economic and ecological activity, and the many elements of the regime that have such an effect. The framework should also examine the way in which the regime affects not only ecological activity directly, but also indirectly through trade and investment flows. Their associated production, management, transportation and related processes, as well as government, regulatory and community action must also be considered. The framework should study these processes along with the conceptual, geographic and the temporal dimensions of the natural and related social world that could be affected.

2.3 Causal. The framework should identify the unique changes brought by NAFTA to the rules and relationships among the three NAFTA parties (as distinct from their previous and other ongoing trade liberalization obligations, activities and their surrounding eco-

nomical forces). Above all, it should trace particular economic and ecological changes within the North American region back to identifiable elements of the NAFTA regime as being their motivating, catalytic or essential contributory cause. Given the complexities of the causal process, it is too stringent to ask that NAFTA serve unambiguously as the sole or even primary cause of subsequent economic and ecological behaviour of interest. However, an identifiable element of the NAFTA regime must serve as a necessary condition for these effects to unfold. This concern with causality strongly suggests the need to proceed progressively at as low a level of analysis as possible, notably that of the individual firm, plant, production line and product, and to identify how key groups have reacted to the NAFTA regime.

2.4 Concrete. Through its focus on the distinctively NAFTA-induced activity of particular firms, social actors and governments, the framework should be concrete. It ought to start with the specific new elements uniquely introduced by the NAFTA regime into North America, their economic impact at the level of the three transborder relationships (US-Mexico, US-Canada, Mexico-Canada) across sectors, and for individual firms and plants that often dominate the major sectors. It should link the way their NAFTA-induced production and management activities, together with government and societal action, affect the environment. Although it is difficult to disentangle NAFTA



⁵ A shadow ecology refers to those far-distant locations from which urban and production centers secure the food, natural resources, and other ecological services required for their survival.

effects from those of other trade agreements, from ongoing processes of North American economic integration, and from fluctuations in economic conditions, an essential starting point is to identify the major elements — especially the rules, dispute settlement mechanisms and institutions — that are unique to the NAFTA regime itself. A detailed examination of key sectors offers an important foundation for the development of an appropriate general framework.

2.5 Policy-oriented. The framework should generate results that permit effective intervention by the CEC, the parties and other interested actors. This suggests a short-term focus on priority issues and sectors, rather than an extended effort to develop an elegant, general analytic model.

To meet these criteria, this paper proposes a framework that begins with the NAFTA regime as the initial causal variable. It then traces the impact of the NAFTA regime on the environment, both directly and through intervening or “connecting” processes of trade, investment, production, infrastructure, and social and political activity. The paper culminates with the impact of these processes and the regime more directly, on major dimensions of environmental quality.

The central analytic challenge is to connect the distinctive dimensions of the NAFTA regime to changes in the central aspects of the state of the ambient environment in North America — the quality and quantity of its air, water, land and biota.

There are a wide variety of specific processes through which NAFTA and the environment may be connected. In the most general terms, the dynamics of human-environment interaction embrace demands for biological resources caused by:

- economic and population growth;
- individual perceptions of the long-term consequences of their actions (e.g., intergenerational equity);
- the ability of economic markets to recognize the true value of services from nature;
- the ability of economic markets to apply the global value of natural services at the local level;
- the capacity of institutions to regulate the use of biological resources as a consequence of changes in human values related to the urbanization of societies, institutions, property rights and cultural attitudes; and
- government policies to correct for the overuse of biological resources and market distortions.⁶

NAFTA's effects on the natural environment will be felt across each one of these dimensions of the socio-ecological process. It will affect these dimensions directly and indirectly through at least four major connector processes:

- production activity;
- the supporting physical infrastructure;
- social organizations; and
- government policies.

These processes also contribute importantly to the institutional and economic context in which decisions about investment and trade will be taken. The removal of restrictions on trade and the resulting

⁶ United Nations Environment Program, 1995.



technological investment may change various environmental management systems, equipment, technology, output levels, magnitude of emissions and residues, and the residue-output ratio. Investment in supporting infrastructure may, on the one hand, accelerate environmentally destructive infrastructure buildup, but, on the other hand, increase research and development, the accumulation of human capital, habitat conservation, and the resource base. Simultaneously, investment may be allocated in organizations and institutions that increase efficiency and sustainability through trade and production. Private investment may not only determine the micro-economic-institutional systems and economic flows, but may also influence governance systems and complementary public investment.

II. The NAFTA Regime

In practice, NAFTA is more than a trade agreement. The core of the Agreement contained a set of rules regulating investment and many other international economic activities among the parties, provisions for dispute settlement, institutions for ongoing management and governance, and incentives for further national policy harmonization and cooperation. Moreover, the core NAFTA Agreement was accompanied by parallel agreements and institutions for environmental cooperation and labour, as well as by three sets of national implementing legislations, tariff schedules and corresponding adjustments to domestic laws and regulations.

Indeed, five distinct dimensions of NAFTA, each taking effect in a sequential if overlapping fashion, have affected and will continue to affect economics (both private-sector and consumer), govern-

mental policy, social activity and, ultimately, environmental quality within the NAFTA area. These five dimensions are:

1. the NAFTA debate;
2. NAFTA's changes to economic rules;
3. NAFTA's dispute settlement mechanisms;
4. NAFTA's intergovernmental institutions; and
5. NAFTA's incentives for policy harmonization.

To some, the NAFTA regime had little independent impact upon subsequent economic or ecological activity, given the processes already underway in the private sector, in the increasingly market-oriented national economies of the parties, and in other trade liberalization arenas. In this view, NAFTA merely codified existing or emerging practices, representing a governmental and inter-governmental response to, and reflection of, economic and corporate activity already underway. Thus, NAFTA was all consequence and no cause, a freezing rather than an acceleration of change, or a move toward codified protection rather than progressive liberalization.

These are important cautions. However, at a very minimum, even where NAFTA merely put a seal of approval on emerging North American trends, this very act reinforced them, established limits and set a path. Moreover, there are good grounds for believing that the ongoing process of trade liberalization, economic integration and community formation underway in North America was not an inevitable trend. Indeed, the very vigour of the NAFTA debate, both before and after its passage, shows that something very important was, and is, at stake.



1. *The NAFTA Debate*

To a considerable extent, NAFTA acquired an identity and had an impact well before the agreements themselves were finally negotiated and came into force. The impact of the NAFTA debate, negotiations and growing prospect of an agreement had an important effect in consciousness raising. This effect took hold in the United States and Mexico as early as 1990 and extended to Canada after Canada joined the negotiations in February 1991. It was particularly pronounced among Canadian and American firms not previously operating in Mexico (and for their Mexican competitors), especially small- and medium-sized enterprises (SMEs) for whom NAFTA served as an invitation to enter new markets and invest.⁷

The subsequent intergovernmental negotiations and attendant political debates over NAFTA had a further impact, primarily affecting national governments by increasing and demonstrating their readiness for NAFTA, and proving to the opponents of the Agreement in their own and partner countries that national policies and practices were living up to, or at least moving toward, the desired “North American” norm. This was seen through the adjustment of longstanding national policies, based in large part on domestic considerations, but also inspired by the prospect of NAFTA.

2. *NAFTA’s Changes to Economic Rules*

The second important dimension of the NAFTA regime is its broad array of

specific rules governing trade, investment and related areas. In some respects, NAFTA’s rules represented a trinational legal codification and recent political reaffirmation of existing rules or national policies. In other instances, NAFTA borrowed from the then-emerging GATT Uruguay Round’s Brussels and Dunkel texts, which were available prior to NAFTA’s drafting. In many cases NAFTA extended the provisions of the FTA to Mexico, thereby concentrating the bulk of the distinctive NAFTA change on Mexico and on its relationship with the United States and Canada. Yet in some significant areas, NAFTA brought new rules equally, to all three parties.

At the core of the NAFTA regime are the changed and codified rules that it established among the three parties governing their economic and commercial activity within the NAFTA area, as well as between the NAFTA’s parties and those outside. Of the many provisions in the NAFTA texts, the most important are those that:

- changed rather than merely codified pre-existing, simultaneously unfolding or soon to arrive practices;
- altered them in a substantial way, both in the direction, magnitude and rate of change;
- affected sectors that do or can constitute the largest portion of domestic or transborder economic, or environmental activities of the three NAFTA parties; and
- took effect at an early stage of the phase-in process.

⁷ These conclusions are based primarily on results of the autumn 1995 specialized interview program, supported by selected media analysis results.



By these criteria, six sets of changes to economic rules stand out.⁸ These are the rules governing:

- tariff reduction and elimination, beginning with the lowering of Mexican tariffs on American and Canadian goods;
- international investment;
- general standards, sanitary and phytosanitary standards, intellectual property, government procurement and rules of origin;
- the automotive sector, especially those relating to Mexico's elimination of automotive industry restrictions and automotive rules of origin applying to the three countries;
- the energy and petrochemicals sector, particularly those applying to Mexican energy and petrochemicals, and American and Canadian energy resources; and
- the agriculture sector beginning with Mexican and American agricultural tariffs but extending to American and Canadian agriculture.

A further important component of NAFTA's rule changes were those relating directly to environmental values and establishing broad environmental limits across the full range of economic behaviour.⁹ Perhaps the most prominent in the core NAFTA text is Article 1114, which is aimed at preventing governments from lowering environmental

standards to attract investment or secure a competitive advantage.

3. NAFTA's *Dispute Settlement Mechanisms*

The third dimension of NAFTA is its dispute settlement provisions. As they have begun operation, NAFTA's new dispute settlement mechanisms process cases and establish precedents greatly affecting corporate decisions to engage in cross-border trade and investment, as well as government calculations with respect to policy formation.

NAFTA established three new dispute settlement mechanisms of central importance.

- NAFTA's Chapter 11 created a mechanism for the settlement of investment disputes between a NAFTA country and an investor of another NAFTA country through international arbitration.
- Chapter 19 of NAFTA established a trilateral process for review and dispute settlement in antidumping and countervailing duty investigations based on the precedent of the FTA. It is likely that Chapter 19 will be the most frequently used of all NAFTA dispute resolution mechanisms.
- Chapter 20 of NAFTA created a general non-binding dispute mechanism for disputes between the parties,

⁸ This list and analysis is based on the consensus among interviewees and experts on the Agreement, given the negotiating history, wording and operation of the Agreement since its coming into force. This was supplemented by a direct review and comparison of the legal texts of the Agreement in selected areas and the consensus of legal scholarship on the Agreement. See Johnson, John R., *The North American Free Trade Agreement: A Comprehensive Guide* (Aurora: Canada Law Book, 1994); North American Free Trade Agreement, "Canadian Statement on Implementation", *Canada Gazette*, Part I, January 1, 1994; Holbein, James R. and Donald J. Musch (eds.) *North American Free Trade Agreements Commentary*, (Dobbs Ferry, New York: Oceana Publications, March, 1995); and Frederick Abbott, *Law and Policy of Regional Integration: The NAFTA and Western Hemisphere Integration in the World Trade Organization*, (Cambridge MA: Kluwer, 1995).

⁹ See Pierre Marc Johnson and André Beaulieu, *The Environment and NAFTA: Understanding and Implementing the New Continental Law*, (Washington DC: Island Press, 1996).



modelled after Chapter 18 of the FTA. Thus far there has been only one case initiated under Chapter 20 of NAFTA.¹⁰ More issues that potentially could have been adjudicated through this mechanism have been settled before a panel was struck. The deterrent effect of the process, coupled with the actual decisions under a Chapter 20 panel, have the potential to significantly affect North American trade and investment processes in environmentally sensitive sectors.

4. NAFTA's Intergovernmental Institutions

The fourth dimension is the set of new intergovernmental bodies for more general management and governance that NAFTA created and inspired. Of considerable importance, as they begin operation and affect outside constituencies, are the elaborate structure of Commissions, Committees and Working Groups to apply, interpret and extend the agreement. Activities of the economic bodies and the CEC, the NADBank and the BECC warrant further attention, as a consequence of their direct responsibility for, and impact on, key environmental issues.

The impact of NAFTA-created and inspired institutions will grow in the coming years, as they build up to operation on a full-scale basis. Moreover, in many cases, they were designed to, and can be expected to operate directly to improve environmental quality.

5. NAFTA's Incentives for Policy Harmonization

A fifth dimension of the NAFTA regime is the incentive it creates for national and sub-national government policy harmonization and further trilateral cooperation. This dimension points most directly to the character of the NAFTA regime as an ongoing process of community formation in which the three national governments continuously adjust to reinforce and take advantage of the rules, provide greater support for each other within and beyond North America, and extend their NAFTA partnership to other policy arenas. Most broadly, this process involves the emergence of a sense of North American community, or at least a perception of a significant and irreversible interdependence and common future among those in the three countries — at the governmental, private sector, NGO and individual levels. Contained within it are important disincentives to closure, protectionism, and a retreat from environmental commitments, especially at times of economic difficulty.

III. NAFTA's Trade Effects

Although the NAFTA regime can have relatively direct effects on environmental quality in North America, its most important impacts could well be indirect, as it first alters trade, investment, and thus production and other processes in the region. Thus it is important to begin by tracing the trade and investment changes

¹⁰ In July 1995, the US requested an arbitral panel under NAFTA to settle its dispute with Canada over its high tariffs on imports of dairy, poultry and egg products. In this instance, the decision potentially will have a major impact on Canadian dairy and poultry industries.



that have come since the NAFTA regime first arose, and suggest the environmental consequences these changes have had. In the first instance, this can be done by identifying the larger macroeconomic forces at work in the North American economy, comparing in this context increases in trade before and after NAFTA took effect in the three component bilateral relationships and in individual product sectors, and considering the immediate pollution impacts of the post-NAFTA-enhanced sectors.

As a trade liberalization agreement, the most direct and immediate consequence of NAFTA are the increases and alterations it caused in the transborder flow of goods and services between the three NAFTA partners, and between them and non-members outside.

1. NAFTA's Limits

NAFTA is the most complete free-trade agreement of modern times. But it does have some deliberate limits. It is a free-trade area under which each country can set its own tariff against non-members and can conduct its own commercial policy. Both these degrees of freedom would have been absent had the three countries chosen to form a customs union. Thus complex rules of origin are necessary to prevent trans-shipment of imports from a low to a high tariff country.

NAFTA, unlike the European Union, is not a common market in which there is free movement of persons across national borders. Chapter 16 of NAFTA contains provisions only for the temporary entry of business persons and technicians necessary to make the free-trade area effective.

Each of the NAFTA countries retains its own anti-dumping (AD) and countervailing duty (CVD) laws. These unfair trade laws are the most widely used import protection devices in intra-NAFTA trade. Chapter 19 of NAFTA permits each of the countries to call for the establishment of a binational panel to determine whether the country imposing an AD or CVD correctly followed its own national procedures.

NAFTA has no provisions dealing with exchange rates, other macroeconomic policies or fiscal or monetary policy, as each of the three countries wanted to maintain a substantial degree of national sovereignty. The recent Mexican experience and the collapse of the peso in December 1994 will probably deepen consultations among the monetary and financial authorities of the three countries.

2. Macroeconomic Conditions

To identify the impact of NAFTA itself on subsequent trade and investment flows, it is necessary to take account of, and control for the other major economic forces which affect the transborder movement of goods, services and capital.¹¹ The most important are exchange rates, overall growth and aggregate demand, interest and inflation rates, and public sector deficits, as the experience following Mexico's December 1994 crisis shows.

The extent and direction of trade in North America is determined primarily by economic conditions and policies within the three countries. NAFTA provided a legal framework designed to further reduce already low border barriers, and to assure stability of trade treatment and encourage investment by



¹¹ Over time, these conditions may be reciprocally affected by NAFTA and the trade and investment changes it generates.

locking in rules of the game. However, NAFTA cannot fully compensate for policies that impede trade, such as a strong Canadian dollar limiting Canadian exports after the FTA went into effect, or the collapse of the peso and the Mexican economy in 1995, which encouraged Mexican exports and discouraged imports.

The level of economic activity is a more important determinant of a country's imports than the height of its tariff. Therefore, there are a number of underlying conditions that must be fulfilled for the free-trade agreement to have its desired investment- and trade-enhancing effects.

Because economic conditions in countries are cyclical, the consequences of trade and investment integration must not be judged on a yearly basis. This is true when considering 1994, when Mexican imports from the United States rose; 1995, when American imports from Mexico soared; 1991, when Canadian exports to the US stagnated because of the strong Canadian dollar; and 1994, when these exports boomed. Conclusive assessments of NAFTA's trade consequences must be made not on the basis of evidence from the first two years of operation, but over a longer period that encompasses different phases of national economic cycles.

The importance of the macro-economic condition within which trade liberalization takes place can be seen in the experience of Mexico over the last ten years. In 1987, Mexico had an annual inflation of about 150 percent, which it gradually brought down to a single digit in 1994. As public sector deficits were gradually reduced and eliminated, businesses limited their price increases, labour moderated its wage demands, and exchange-rate depreciations were restricted to less than the difference between American and Mexican inflation

rates. As a consequence, the peso moved from a position of undervaluation with respect to the American dollar in 1987, to overvaluation by 1994.

Simultaneously, because the import regime was opened and overall economic growth was positive, Mexico found itself with a growing trade and current-account deficit. The latter was financed by capital inflows, both direct and portfolio, which not only covered the deficit, but permitted Mexico to augment its foreign reserves. A series of internal and external shocks and the ensuing disappearance of most of these reserves precipitated the ill-fated devaluation of the peso in December 1994.

The peso, which had been trading at about 3.75 to the US dollar at the start of December 1994, held steady in the final months of 1995 at about 7.6 to 7.8 to the American dollar, representing a devaluation of more than 50 percent. This has overshadowed Mexico's ongoing tariff reduction under NAFTA. Mexico's GDP fell in 1995 by almost 7 percent, weakening overall import demand. As a result of lack of demand within the Mexican economy, coupled with the favourable exchange rate, exports rose substantially, particularly to the United States, by far Mexico's main market. Mexico's trade account, which had been in deficit by US \$18 billion in 1994, registered a surplus of more than US \$7 billion in 1995. This is a remarkable one-year turnaround for an economy the size of Mexico's. The current account balance, which had been almost US \$29 billion in deficit in 1994, was roughly in balance in 1995.

The Mexican peso is floating, with only occasional and modest official intervention. Similarly, Mexico's interest rates are floating: that is, are determined by the market. The financial situation in Mexico is stabilizing and the country



Table 3.1
Intra-North American Merchandise Trade

(Billions of US \$)

	1993	1994	% Increase
Canada to US	111	129	16
US to Canada	100	114	14
Mexico to US	40	50	24
US to Mexico	41	51	22
Canada to Mexico ¹²	0.6	0.8	21
Mexico to Canada	2.9	3.3	12

Source: US Department of Commerce and Statistics Canada.

Note: Figures are rounded; percentage increases calculated from actual data.

should experience some real recovery in 1996, perhaps in the order of 2 to 3 percent. The drop in GDP in Mexico in 1995 was the sharpest in the post-World War II period — greater than in the crisis of 1982. But the recovery is proving to be more rapid than in 1982.

Mexico's capital and intermediate goods imports held their own and even increased in 1995 over 1994, a reflection of the export-led strategy of individual companies. The import decline was in consumer products. American merchandise exports to Mexico were higher in 1995 than they were in 1993, the year before the NAFTA went into effect. Canada's merchandise exports to Mexico were higher in 1994 than they were in 1993, and were higher during the first six months of 1995 than during the comparable period of 1994. Thus, amidst powerful surrounding economic forces, the autonomous trade-enhancing impact of NAFTA is clear.

Mexico's trade picture is dominated today by the macroeconomic scenario — the combination of a depreciated peso,

weakness of domestic demand, and an export-led exit from the nation's economic troubles. NAFTA, by enabling export-led growth to flourish, is more important for Mexico today than ever before.

3. Key Trade Sectors and Flows

Table 3.1 summarizes total 1994 trade between the NAFTA countries, as a first indication of NAFTA's trade-enhancing effects before the impact of the 1995 economic crisis.

It thus appears that NAFTA's immediate trade enhancing effects came in Mexican exports to the US, US exports to Mexico, and Canadian exports to Mexico. Of the leading 15 American imports from Mexico in 1994 (at the ten-digit level under the Harmonized System, or HS), eight were automotive products, two were petroleum products, four were television or radio products, and the final category was a catchall of items returned after being exported from the United States. Of the 15 leading American exports to Mexico, six were automotive products, three were



¹² It should be noted that Canada-Mexico trade is understated by an estimated 40%, given the counting that arises from extensive trans-shipments of the goods via the United States.

Table 3.2
Export Items that Increased in Value Above the Overall
Average (1993 to 1994)*

(Listed in descending order)

Canada to US	Iron and steel, aluminum products, plastics, furniture, aircraft and parts, boilers and machinery, wood pulp, wood articles
US to Canada	Aluminum products, optical and photographic equipment, electrical machinery, vehicles, iron and steel, plastics, furniture, boilers and machinery
Mexico to US	Iron and steel, clothing, boilers and machinery, optical and photographic equipment, plastics, electrical machines, furniture
US to Mexico	Iron and steel, grain, meat, plastics, aluminum articles, boilers and machinery, paper products
Canada to Mexico	Pearls, laminated products, oilseeds, paper products, salt and sulphur, wood pulp, aircraft and parts, furniture, grains
Mexico to Canada	Electrical machinery, optical and photographic equipment, boilers and machinery

* Note: Defined as those two-digit items under the HS of nomenclature that comprised at least 1 percent of exports in 1994 and increased by more than the overall average.

machinery parts, and others were plastics, agricultural products, and various unspecified low-value items.

Canadian exports to the United States similarly were dominated in 1994 by automotive products, followed by petroleum and wood pulp items. Automotive products also led the American exports to Canada.

To complete the triad, transportation exports were the most important of Canada's exports to Mexico in 1994, alongside crude materials and food and beverages. Transportation equipment dominated Mexico's modest overall exports to Canada.

Two comments are warranted. First, the largest absolute, as opposed to percentage, increases in 1994 were in the big-ticket items, such as vehicles, machinery, oil and gas. Second, the importance of intra-

industry trade, or trade growth in similar items, is evident.

Given these patterns, the next stage of the analysis could usefully focus on two tasks.

- The first is to correlate the sectors of above average increase (see Table 3.2) with NAFTA's initial tariff reductions and other liberalizations, to demonstrate the extent of the immediate NAFTA effect.¹³
- The second is to conduct more detailed studies of the dynamics and linkages in the largest sectors of shared trade and shared post-NAFTA growth, notably automotive, transportation, petroleum, and forest (wood pulp, wood articles, paper) products, after ensuring that their absolute and increasing size continues into 1995 and beyond.

¹³ As part of this analysis, one could compare the trade of each NAFTA party with each other, to their trade with non-members, taking into account Uruguay Round rule changes and relevant macroeconomic conditions.



4. *Maquiladoras*

Within the overall trade patterns, it is useful to examine NAFTA's particular impact on the *maquiladora* plants along the Mexican side of the border with the US, particularly given their central place in the US-Mexican trade and in the NAFTA environmental debate. At first, *maquiladoras* were export-processing plants designed to allow the import of American goods in bond (that is, without payment of import duty) for further processing and then re-export back to the United States. The United States charged the duty only on the value added in Mexico on the re-imported product. Most Mexican value added was labour, although utility and related costs were included.

The system flourished due to the low cost of Mexican workers, the favourable location close to the American border, the growth of globalization and intra-firm trade, and the tariff advantages, although these were applicable for products from export processing zones in other countries as well. These goods enter the United States under HS items 9802.00.60 and 9802.00.80, particularly the latter. American 9802.00.80 imports from Mexico in 1993 were US \$18.8 billion, of which the dutiable portion was US \$9 billion, or approximately half. That means that half of the American imported value consists of products exported earlier from the United States.

There are now about 2,000 *maquiladora* plants, 90 percent located along the border, employing 600,000 persons, about 60 percent female. Their production today goes well beyond simple processing. The most important products produced by the *maquiladora* plants are automotive and electronic equipment parts.

The tariff advantage of the *maquiladora* plants will gradually disappear under the NAFTA as all trade between the two countries becomes duty free. The locational advantage of the border will continue. At present, *maquiladora* plants can export up to 50 percent of their production into Mexico itself, paying the requisite duty on the imported components. However, this distinction between shipment to Mexico or to the United States and Canada will gradually disappear. This may lead to the incorporation of the *maquiladora* production into the overall industrial structure of Mexico rather than its continuing existence as a special enclave.

5. *Links to Pollution Intensity*

An important analytic task is to determine, first by sector and ultimately by firm and plant, whether the trade following and flowing from NAFTA is more environmentally benign or damaging than the production it displaces and than its non-NAFTA equivalents generate. An initial mapping of this complex relationship can be secured by matching these sectors where post-NAFTA trade has most increased, with evidence about these sectors propensity to pollute.

The World Bank's Industrial Pollution Projection System (IPPS), although still in its initial stage of development, attempts to provide a guide to probable pollution problems. The toxic release intensities that have been developed by four-digit International Standard Industrial Classification (ISIC) codes can be compared with the items whose trade is largest and has increased most since NAFTA went into effect. This sectoral comparison permits a first approximation of the polluting effects of the Agreement.¹⁴

¹⁴ It must be recognized that these scores have been calculated from the US rather than Canada and Mexico, and that the different structure, and rapid but different modernization of Mexican industry may provide a different mix. The World Bank is currently calculating scores for Mexico directly, and these should soon be available.



The picture is mixed. The production of motor vehicles, the most important sector of intra-NAFTA trade, ranks relatively low in toxic intensity. Machinery and equipment ranks in the mid-range of products studied by the IPPS. Pulp, paper and paperboard rank relatively high, as do plastic products and furniture. Photographic and optical goods rank relatively low, and iron and steel relatively high.

NAFTA facilitates the manufacture of the various components of final products in the three countries for shipment throughout North America without major border impediments or charges. As such, the NAFTA helps attract American, Canadian and other foreign investment into Mexico to take advantage of the endowments Mexico offers, such as the relatively low cost of labour, the growing market, and proximity to the United States. Increasingly, therefore, one should expect a growing emphasis in intra-NAFTA trade on intermediate products and in intra-firm and intra-industry trade. This, in fact, is what we are witnessing, as was the case earlier in US-Canada trade.¹⁵

One aspect of this greater cross-border production sharing that requires examination is whether these increasingly integrated American and Canadian corporations adopt the same level of environmental equipment technology and management when they invest, source and ship to Mexico as they employ at home. One would look not just at the pollution-intensity indexes of products whose trade has increased since NAFTA took effect, but also at the techniques used in this production (ultimately including its natural resource use).

In addition to merchandise trade, NAFTA deals extensively with trade in services as well. Foreign investment is increasing in Mexico both in the tourism and financial services industries. Such services are relatively less-polluting than manufacturing. The increase of trade (and investment) in services that is accompanying the increase in merchandise trade requires separate analysis.

IV. NAFTA's Investment Effects

In the judgement of some knowledgeable observers, NAFTA was as much an investment as a trade agreement.¹⁶ Moreover, during the NAFTA debate, there was widespread concern that the Agreement would allow investment in "dirty" industries to migrate, through foreign direct investment, from countries with higher environmental standards and enforcement to those with lower ones.

For both reasons, it is important to analyze the effect of NAFTA on investment.

Interviews conducted with investors are intended to identify whether, how much, and which dimensions of NAFTA have been an important factor for their investment, including their investment in environmental controls and equipment. They provide a first approximation of the issues that might be confronted by researchers attempting any comprehensive measurement of the environmental effects of NAFTA. In most instances, the effects of increased investment and increased trade are intertwined, and they jointly affect the environment in ways that vary from industry to industry.

¹⁵ A full 40 percent of Canada-US trade is between different parts of the same firm, and a further 30 percent between firms linked in business relationships. Sidney Weintraub, "Current State of US-Canada Economic Relations," in *The American Review of Canadian Studies*, 24 (Winter, 1994), pp. 473-488.

¹⁶ Rugman, Alan (ed.), *Foreign Investment and NAFTA* (University of South Carolina Press, 1994), p.53.



Table 4.1
US FDI to Canada and Mexico

(Average values per year in billions of US \$)

	1987-89	FTA/NAFTA	1994
Canada	\$5.6		\$3.2
Mexico	\$0.9		\$1.2

Table 4.2
Canadian FDI in the US and Mexico

(Average values per year in billions of US \$)

	1987-89	FTA/NAFTA	1992-94
US	\$32.3		\$47.8
Mexico	\$0.2		\$0.9
	(1984-1991)		

They represent a complex task for measurement.¹⁷

The following overview establishes, in the pre- and post-NAFTA period, the size of the investment stocks and flows, and distinguishes different types of direct foreign investment between domestic and foreign investors. It notably identifies those investors who rely on frequent technological change being incorporated into the products, and those relying more on marketing and advertising. For these different investors, varying investment strategies in the NAFTA region are identified.

1. Stocks and Flows of FDI

NAFTA is relatively recent and has not fully materialized in terms of the mobilization of investment between countries nor of the full industrial restructuring it is likely to cause.¹⁸ Nevertheless, there are some clear trends which trace the influence of NAFTA back to 1991, when investors began to anticipate the

passage of NAFTA by the legislatures of the three countries.

FDI flows by the United States (the largest investor) were the greatest into Canada in the period before NAFTA, when the FTA took maximum effect (see Table 4.1). From 1990 to 1992, US investment in Canada declined, only to strengthen in 1993 and 1994. US investment in Mexico was very weak before NAFTA, but rose during the NAFTA period. Thus, although FDI flows are affected by many events and by the macroeconomic cycle, it appears that both the FTA and NAFTA had a positive impact on FDI flowing from the United States to Canada and the United States to Canada and Mexico, respectively.

Canadian FDI has also risen (see Table 4.2). Investment going to the United States has risen from 1989 onwards. Most strikingly, as with the trade flows, Canadian FDI to Mexico tripled from US \$0.2 billion between 1984 to 1991

¹⁷ There are strong interdependencies between trade and investment, both as foreign investment gives rise to intra-corporate trade, and as exporters establish facilities abroad for after-sales servicing, distribution, marketing and assembly.

¹⁸ In assessing stocks and flows of FDI in and among the NAFTA countries, the principal statistical source employed is the US Department of Commerce data, based on historical costs, given the fact that this is the most comprehensive source, and contains some disaggregation by economic sector and by countries. Such a presentation facilitates the analysis of data on Canada and Mexico insofar as the investment recorded is between the United States and these two countries. In the case of Mexico, the availability of US data is extremely useful, as there is an inconsistency in Mexican data between balance of payments flows of FDI (from the Bank of Mexico) and figures of "approved" or "registered" FDI by the Ministry of Commerce and Industry. The use of historic cost figures nevertheless leads to a substantial under-estimation of the current market value of FDI.



Table 4.3
Stock of Mexican FDI to the US

(Average values per year in billions of US \$)

US Department of Commerce Figures for Incoming FDI		Mexico's Statistics for Incoming FDI generally	
1987	1994	1984-90	1991-94
\$0.9	\$2.2	\$21.2	\$59.0

to US \$0.4 billion between 1992 to 1993 and to US \$0.9 billion in 1994.

Mexican investment in North America is much smaller and mainly concentrated in the United States (see Table 4.3).¹⁹ This shows a slight increase in the stock from 1987 to 1994, with most coming in 1994. Mexican statistics show a larger amount of incoming FDI, which confirms the upward trend from the pre-NAFTA to the post-NAFTA period. According to these data, the stock of FDI rose from an average of US \$21.2 billion during 1984 to 1990 to US \$59.0 billion during 1991 to 1994.

2. Characteristics of FDI in North America

The characteristics of US FDI in and flowing to Mexico and to Canada are very different. Mexico is at a much lower base, which means that the effect of a single event such as NAFTA on the flows of investment will be larger than for Canada, where US FDI has existed for a longer time and in much higher amounts. Also, US FDI in Mexico employs much more labour than does US FDI in Canada. Thus, US investments in Mexico accounted for 10 percent of all employees of US FDI abroad, but only 3.2 percent of total US assets abroad. In Canada, US FDI represents 13.1 percent of all employment, and 11.7 percent of all total US assets abroad.

With regards to the intensity of international trade, both Canada and Mexico show a high share of American trade with foreign affiliates. US exports to affiliates represented 11.7 percent of the total or 3.6 times the Mexican share of total assets. In the case of Canada, exports were 36.5 percent of the total, or 3.1 times the share of Canadian assets. Thus, Canada is very important for US investors as a source and a destination for American trade related with US FDI and is well above the average share of trade related to US FDI in the world. Mexico shows a similar intensity of trade and, in proportional terms, surpasses the Canadian share for US exports to foreign affiliates. The figures suggest that Mexico has a good opportunity as a recipient of trade-motivated FDI from the US and possibly also from Canada. In conjunction with the evidence on employment, this suggests that one powerful reason why US FDI is attracted to Mexico in trade-intensive activities is because of the low cost of Mexican labour.

The bulk of US FDI in Canada is concentrated in manufacturing, and especially in the automotive industry. US FDI in financial services ranks second, and petroleum third. In Mexico, most US FDI is concentrated in manufacturing. Only since 1993 has it begun to rise in the financial sector. Therefore, the automotive industry, processed food and beverages,

¹⁹ The only statistical source available is the US Department of Commerce for incoming FDI into the United States.



Table 4.4
US FDI in Mexico in the
Manufacturing Sector

(percent of total US FDI to Mexico)

Processed food, beverages and tobacco	10.5
Metal products and machinery (including automobiles)	9.0
Chemicals	6.1
Textiles	2.5
Basic metals	1.9

electronics, computers, office equipment and, in the area of services, banking, telecommunications and retail trade are prominent as recipients of FDI in North America.

Although US sources do not report the flows of FDI in greater detail than the manufacturing industry as a whole, Mexican sources do. According to the Mexican data, 33.6 percent of the US FDI in Mexico during 1989 to 1994 went to manufacturing. The largest share in manufacturing was processed food, beverages and tobacco; metal products and machinery, and chemicals. Of minor importance were textiles and basic metals (see Table 4.4).

US FDI in services was very important. It included trade (13.1 percent of total US FDI), communications (3.9 percent), real estate (16.4 percent), financial services (4.9 percent), and professional services (12.3 percent). These service sectors recorded the highest increase between 1991 and 1994 and, apart from cars, US FDI in services grew faster than US FDI in the manufacturing industry. However, the total flow of FDI into Mexico during the period 1991 to 1994 was US \$21.5 billion, which although considerable, is less than the amount of portfolio investment. As portfolio investment was mainly to finance Mexican investors rather than foreign

investors, it follows that NAFTA had a major effect on investment but it was greater on domestic investment than on investment by multinational corporations (MNCs).

Total Canadian investment in Mexico increased almost 200 percent during a 7-year period from US \$140.2 million in 1982 to US \$417 million in 1990. This figure, however, is less than 1 percent of US \$74 billion of Canadian FDI abroad. The rise in Canadian FDI in Mexico is concentrated in automobiles, computer software, real estate, services, mining and telecommunications. Canada also has a strong presence in the banking sector. Two Canadian banks, the Bank of Nova Scotia and the Bank of Montreal, are major actors in Mexico. As of the first semester of 1995, Canada accounted for 9.4 percent of the total FDI in Mexico. This represents approximately one-fifth of the US total, but it is a relatively large amount compared to the flows from other countries with a tradition of investing in Mexico.

Although a closer look at the changes in FDI by year and by sector is required, it is clear that in the investment as well as the trade relationship, the automotive sector deserves pride of place in any detailed sectoral examination.

3. Foreign Portfolio Investment

Foreign portfolio investment (FPI) is considerably larger than FDI in North America as a result of the liberalization of financial markets and the mushrooming growth of mutual funds and cross-border financial transactions. The NAFTA effect on these flows is less-pronounced between Canada and the United States, as financial networks between the two countries were developed thoroughly before NAFTA. Nevertheless, in the case



of Mexico, FPI has grown sharply, largely as a result of NAFTA but also in conjunction with other events. The individual influence of each factor is difficult to isolate.

The largest FPI into Mexico was in securities, issued primarily by the Mexican government. This investment has risen from zero to flows of US \$8.1 billion in 1992 and US \$7.4 billion in 1995. The total value of foreign-held securities reached US \$21.1 billion of which the bulk was placed in dollar-indexed Tesobonos. Following the peso devaluation, investors in these instruments forced the Mexican Government to accelerate redemption of such instruments. This explains the fall in the balance of FPI in Mexican securities to US \$11.1 billion by June 1995. There is little doubt, however, that as the Mexican economy recovers, FPI will regain its previous high levels.

Another important component of FPI in Mexico are flows to finance the private sector. These consist of equity investment (most often preferred stocks or convertible stocks) and bonds. In recent years, these flows have been impressive. In equities, FPI flow was only US \$493 million in 1989, but rose to US \$2.0 billion in 1990, and from 1991 through 1994 to \$25.9 billion. Apart from minor sales of these equities in 1994 to 1995, the majority of the holdings were maintained through the devaluation and recession of 1995 by foreign investors, as many of the holdings were held by long-term investors (usually institutions which do not change their investment strategy in the short term). Moreover, prices of equities fell so sharply (to about half of their dollar peak-price) that their sale would render massive losses to investors. Finally, in 1995 the American financial markets, in which most of these investors are based, maintained a very high level of liquidity, which favoured FPI abroad.

Equity FPI was concentrated in telecommunications and transport (US \$25.9 billion of total capitalization of US \$54.5 billion) at the peak in December 1993. This was followed by construction (US \$7.3 billion), services (mainly banking at US \$6.1 billion), industrial materials (\$5.5 billion), and retail trade (US \$5.3 billion). All of these sectors are dominated by Mexican investors. The flow towards subsidiaries of MNCs was very small. This flow was concentrated mainly in joint ventures in which foreign investors generally have a minority position: paper, chemicals and automotive parts (under the heading of industrial materials). Another small portion of foreign investment was represented by retail trade.

In the placement of bonds, the situation was much the same. The Mexican private sector only began to place paper in the international market in 1991, and the total flow of resources through these instruments was US \$11.8 billion. An examination of the bond debt outstanding in 1995 indicates the bulk of these resources went to cement, telephones, retail trade and services, banks, telecommunications, chemicals, television, construction, as well as paper and forestry products. Again, foreign investors are seldom represented in these firms, and when they are, they hold a minority share.

4. Investors' Strategies

Investment under NAFTA is carried out by foreign as well as domestic investors. The response to NAFTA by foreign investors was the greatest in the United States and Canada. In Mexico, NAFTA had an even greater effect in stimulating domestic investment. These groups of foreign and domestic investors must be distinguished.



Foreign Investors

Foreign investors consist mainly of Multinational Corporations (MNCs). They invested under NAFTA in two main sectors. One includes industries of developed technological superiority in which the products change to reflect technical change. This compels the corporation to specialize in subsidiaries abroad and in a specific product or group of products, including components. The plants then trade these products intensely. This trend is reflected in the trade statistics in which cars, electronics, office equipment and other engineering industries record the highest increase in three-country trade.

A second group of foreign investors produce goods that reflect less technological change but rely heavily on intensive marketing and advertising. These products can be produced in any country and they consist of a combination of products to meet local tastes, such as bread, cookies, chocolate or soft drinks. There is not much scope for international trade, as transport costs are frequently high relative to the value of the product. The international investment in this second group of products is, however, very large, as investors try to dominate markets and maximize the impact of advertising expenditures on local consumption. These industries are large investors but not large traders. Mexican statistics suggest that FDI has been concentrated in these sectors.

Domestic Investors

Domestic investors produce standard products that employ neither heavy marketing and advertising nor complex technological processes, but require large-scale use of and assured access to, basic raw materials. These firms are concentrated in wood, paper, metals, chemicals, fertilizers,

glass and cement. In these industries, Mexico is a strong producer as it has natural resources such as oil, stone and electricity as well as regulations that have permitted a heavy concentration of ownership and oligopolistic structures. Therefore, under NAFTA, the FDI is strong in the two types of industries mentioned above and much less in the third type.

Mexican investors also specialize in a variety of services. These include public utilities and banks, (which were privatized and sold to Mexicans, while often excluding foreigners or substantially limiting foreign ownership), insurance, retail trade, television and radio, transport, and construction. These industries formerly had been closed to foreign investors. It was only after the 1994 to 1995 crisis that some of these sectors began to open up to foreign investment.

NAFTA's Effects on Investors

The NAFTA regime and its rules are designed primarily to maximize trade between engineering industries, where foreign subsidiaries rely on technological innovations and product changes from the parent company and, therefore, maintain operational links with the parent company. Thus, trade flows of components and finished products are very large. NAFTA liberalizes this trade and enhances the investment regime for the benefit of North American producers by establishing restrictive rules of origin. These are designed to deny international investors from outside North America the benefits of NAFTA unless they are prepared to carry out substantial manufacturing operations in North America.

NAFTA also favours, by different means, industries whose strengths are based on marketing and advertising. Dimensions of the NAFTA regime important in these instances are: reduction of tariffs,



guarantees on intellectual property protection, and a streamlining of the investment regime (including a dispute settlement mechanism) to provide additional certainty and protection to investors against acts of the host country government.

However, in industries dominated by domestic producers, NAFTA took a protectionist turn. It restricted trade and investment liberalization in certain sectors in the short term, while providing for a gradual liberalization of trade. NAFTA's provisions governing textiles contain a rare mixture of slow trade liberalization and protectionist rules of origin (mainly against producers from outside North America). NAFTA also protected telecommunications, the so-called "cultural industries", maritime transport, and the Mexican energy and banking sectors, often leading to no liberalization. Nevertheless, given the presence of large firms dominating these sectors, some cross-country investment has been made on the fringes, for example in long-distance telephones in Mexico. Moreover, international trade is enhanced as a part of trade liberalization for the region by the adoption of a dispute-settlement system that will reduce uncertainty about market access. Thus, domestic producers in these sectors have benefitted both from the protectionist rules on investment and trade liberalization. This explains the substantial amount of funding for these firms through FPI.

To conclude, as NAFTA took shape and effect, exports have increased in all directions within the NAFTA region. Investment (both FDI as well as FPI) has followed, increasing mainly in Mexico. Domestic investment has also risen substantially in Mexico for the production of standard products and services, many of them focused on the North American export market. The investment regime

of NAFTA predictably enhances the opportunities for investment, mainly by MNCs, but also by domestic producers who want to expand in their own sectors and increase their exports to Canada and the United States.

V. DIMENSIONS AND INDICATORS OF ENVIRONMENTAL QUALITY

The NAFTA regime, and the trade and investment it created and diverted, can be expected to have a substantial, cumulative, long-term effect on much of the North American environment and the many ecosystems which comprise it. Although many of these impacts are not yet empirically evident or conceptually well-understood, and while the complex North American environment responds to a vast array of natural and human forces (of which NAFTA is but one), it is nonetheless important to construct a framework focused from the start on the ultimate concern: the ambient environment in its full scope and complexity. This sector outlines a framework and indicators for treating the ambient environment. The subsequent section examines in more detail the specific processes through which NAFTA, and its trade and investment, are connected to, affect, and are affected by, this ambient environment.

1. *The Ambient Environment and its Stability*

Environmentalists use the term "ambient" environment to refer to the medium composed of atmosphere, water, land and biota that surrounds human activity and provides the renewable and non-renewable natural resources necessary to sustain life. Thus, the ambient is a critical determinant of human activity and life in general. Usually, ambient environmental components are described by indicators of quantity and quality that single out



**Table 5.1
Potential Quantity and Quality Issues Arising from the
Ambient Environment**

Component	Quantity	Quality
Air	Scarcity of clean air	Pollution
Water	Shortages	Pollution and contamination
Land	Land scarcity (erosion)	Nutrient leaching, waterlogging, salinization
Biota	Cover loss, overexploitation	Reduced primary productivity, loss of diversity, species replacement, genetic erosion

potential issues related to human life (e.g., health) and environmental status. Table 5.1 describes potential quantity and quality issues of each of the ambient's components. Quality issues may become scarcity issues. For example, clean air may become a scarce good, and water may become completely useless because of heavy pollution.

Environmental quality must be compared with a welfare aim or reference value, usually represented by a baseline target of environmental quality that minimizes potential risks for human life-quality and production. Often such a comparison is

part of a management process in which environmental stress components and societal response components are also present.

Environmental problems acquire special sustainability significance when related to natural stability thresholds resulting from ecosystem functioning. Ecosystems are functional units that include both abiotic (non-living) and biotic (living) components of the ambient, and their processes of interdependency, reproduction and evolution.²⁰ Several feedback mechanisms regulate and stabilize ecosystem processes, including the climate,

²⁰ Major abiotic features of the ecosystem include the following bio-geophysical processes:

- the hydrological cycle (i.e., the set of processes that maintain the flow of water through the terrestrial and atmospheric branches of the hydrosphere);
- the process of regulation of atmosphere movement and composition;
- the cycles of energy (radiation-absorption-transference-radiation);
- the climate (micro, meso and mega); and
- the nutrient cycles (carbon-oxygen-hydrogen cycles intersecting in plants, nitrogen, phosphorus, sulphur, calcium, magnesium and potassium).

Biotic features include:

- species, defined as groups of individuals, reproductively isolated from individuals belonging to other species;
- species interactions (e.g., competition, mutualism, commensalism);
- populations, or groups of individuals more or less isolated from other populations of the same species, characterized by demographic and genetic processes and parameters; and
- biological communities, or groups of populations of different species bound together by the landscape and/or an intricate web of relationships. This web includes food chains (chains of primary producers, e.g., plants, herbivorous, carnivorous and detritivorous species through which energy and nutrients flow) and biological species succession in time. This biological web is embedded in the physical environment, interacts with it, and modifies it. Soil building is typically the result of such interaction.



the distribution of soil and surface water, the amount of nutrients and contaminants in the atmosphere, hydrosphere and soil, the natural populations' demography, and the interaction among species. There may be stability thresholds that, once surpassed, may precipitate the system into new equilibria, usually implying acute deterioration or extinction.

Human activities generating pollution or toxification of the soil, water and atmosphere, habitat loss, fragmentation or degradation, over-exploitation of natural populations, or introduction of non-native species, may disrupt the feedback mechanisms or balancing processes and surpass the stability thresholds of the ecosystem. Pollution and disruption of ecosystems also reduce their absorptive capacity and often lead to a reduction of the ecosystem's resilience (i.e., the capacity to recover from stress) and to an increase in the variability of natural processes and cycles at the regional and global scale (e.g., less predictable rain patterns or an increase in tropical storms). In general terms, economic activity relates to environmental stability in three different ways.

- First, historical evidence shows that increased economic activity may push ecological processes over their stability thresholds, making ecosystems, communities and populations roll downhill to their degradation or extinction.
- Second, bio-physical thresholds have already been reached in various places at various times, and in many places local peoples have initiated processes of reorganizing resource allocation, socio-economic institutions and technology, so that a socio-ecological balance could be acquired and production could keep pace.

- Third, this socio-ecological balance could be upset if indigenous or exogenous social forces undermines the institutional and technological bases that provide sustainability. In this case, natural forces of disruption would operate, generating environmental degradation.

Correspondingly, there are three general ways in which NAFTA could affect ecosystem sustainability.

- NAFTA's new trade and investment flows could disrupt ecological stability, resilience and natural variability at different levels of ecological constituency and functioning.
- NAFTA could provide resources for acquiring the necessary balance through investment in environmentally sound technology, production and resource management systems, human capital, information and new institutions.
- NAFTA could contribute to the erosion of previously existing, balancing socio-ecological processes, mainly through the displacement of human activity due to increasing competition or the re-allocation of resources between environmental protection, restoration and other uses.

The net effect of NAFTA on the environment will depend on its relative contribution to these processes. This will result from decisions of individuals determining levels of economic activity and the allocation of physical and social resources, risk between present consumption of goods and services, and investment. To analyze the factors involved in such decision-making processes, it is



necessary to provide a conceptual reference on which to base the analysis of more specific forms in which NAFTA may contribute to economic growth, investment in environmental sustainability or to the erosion of socio-ecological balancing processes. From this, specific hypotheses to guide future analysis can be generated.

2. Constructing a Framework of Indicators

In the development of such hypotheses, it is essential to begin with a set of indicators that permit the continuing observation of changes, in quantity and quality, of the atmosphere, water, soil and biota in the NAFTA region.

The development of environmental indicators is currently an area of active international research. Several conceptual frameworks that have been proposed for organizing indicators can be found in the literature on State of the Environment reporting.²¹

- The issues framework defines indicators according to their relevance for key environmental issues (e.g., acid rain, climate change, waste disposal).
- Resource frameworks focus on developing indicators of natural resource use (e.g., forestry, fisheries, mining, energy).
- Environmental media frameworks focus on indicators that measure impacts on different media in the natural environment (e.g., air, water, land, biota).
- Environmental process frameworks identify not just indicators of environ-

mental media or resource use, but also indicators of the relationships between human activities and the environment.

The Condition-Stress-Management-Response framework is one of the most popular environmental process frameworks. It is used for environmental reporting by Environment Canada and, in a modified form, by the OECD. It links the effects of human activity stressors, such as emissions from industrial activity or resource extraction, to changes in environmental conditions, such as the concentration of air and water pollutants.

A final conceptual framework for State of the Environment reporting is the combination framework. It is the most common type of framework used in practice and, as its name implies, combines two or more of the above frameworks. This is the type of framework that can best serve the needs of the present study. The primary emphasis of this study's framework will be on indicators of environmental media, but in some cases it will be useful to link the media indicators with specific environmental issues. This study will also use elements of an environmental process framework, in that it will develop indicators of emissions (i.e., stressors arising from human activity) and management responses. The environmental process framework will be particularly important for future sectoral studies.

3. Selecting Indicators

In addition to conforming with the framework, indicators must also satisfy a number of selection criteria regarding their overall validity and viability. These selection criteria can be used in reducing a "long-list" of indicators to a "short-list".



²¹ See for example, Sheehy, G. *Organizational and Spatial Frameworks for State of the Environment Reporting*. Environment Canada, State of the Environment Reporting Branch, Ottawa, 1989.

There is a fairly extensive literature dealing with criteria for selecting environmental indicators.²² This study will use the following selection criteria against which proposed indicators will be evaluated:

- relevant to the needs of potential users and stated goals;
- scientifically valid;
- representative of a broad range of conditions;
- responsive to change;
- based on accurate and accessible data;
- based on data that are available over time;
- understandable by potential users;
- comparable to thresholds or standards;
- comparable with indicators developed in other jurisdictions; and
- cost-effective to collect and use.

These criteria, not necessarily exhaustive, have been most often used in the past and appear most relevant in the current context. This is in recognition that not all indicators chosen may be able to satisfy all of the above criteria and that there will have to be trade-offs made among them. However, most of these trade-offs will be short term in that, over the long run, as more data becomes available and as the level of scientific knowledge about environmental processes and the NAFTA-environment interactions increases, the indicators will be modified and improved.

The “relevance” criterion is one of the most important in the above list. “Relevance” in the current context means whether it is relevant for determining the environmental effects of NAFTA.

This is determined by asking whether an indicator addresses the following concerns:

- Those particular aspects of the physical environment that the authors of the NAFTA and NAAEC agreements felt were sufficiently important to identify within the NAFTA texts as environmental problems or conditions that the NAFTA regime should address and respect.
- The particular concerns about the North American physical environment that were at the forefront in public policy discussions at the time NAFTA was being debated, negotiated and approved.²³
- The anticipated or actual environmental effects that experts feel NAFTA has caused, after having observed the operation and consequences over the past two years.²⁴
- Any other environmental impacts flowing from the particular production and other processes which NAFTA has produced.

4. A Long List of General Indicators

At this stage, it is appropriate to develop a long list of general indicators. General indicators are those which are of general concern, and can be used in describing the impact of the NAFTA policies at the country level and regional scale. Many of them will also be useful for the sector-specific studies. There are significant methodological problems involved in

²² See, for example, Environment Canada. *A Report on Canada's Progress Towards a National Set of Environmental Indicators*, Environment Canada, State of the Environment Reporting Branch, Ottawa 1991; Forrest, W. and Morrison A., “A Government Role in Better Environmental Management,” *The Science of the Total Environment*, 108: 51-60, 1991; Council of Great Lakes Managers. *A Proposed Framework for Developing Indicators of Ecosystem Health for the Great Lakes Region*, International Joint Commission for the Great Lakes, 1991.

²³ Commission for Environmental Cooperation. *NAFTA Effects, An Index of Claims and Arguments about Potential NAFTA Effects, 1991-1994*. November, 1995.

²⁴ These effects were identified by means of the series of specialized interviews conducted with business, government, NGOs and academics in all three countries during the autumn of 1995.



Table 5.2
Environmental Indicators for Air

Category	Indicators
Outdoor urban air quality	Ambient concentrations of common air pollutants: TSP (PM10), CO, SO ₂ , NO _x , O ₃ Ambient concentrations of toxic air pollutants: Inorganic toxics (Pb, Mn, etc.), organic toxics (VOCs, PAHs, dioxins, furans)
Acid rain	Emissions of: SO ₂ , NO _x
Climate change and ozone depletion	Emissions of: CO ₂ , CFCs, N ₂ O, CH ₄

trying to separate out the effects of NAFTA in reporting these indicators. Possible solutions to these problems are currently being examined. In an area such as the US-Mexico border, or other areas of concentrated activity caused by NAFTA where it may be determined that at least some of the environmental effects of NAFTA are pervasive, indicators of ambient environmental quality may be most appropriate for capturing the complex interactions that result in changes to environmental conditions.

The long list of general indicators will eventually be screened to determine the extent to which indicators on the list meet the selection criteria. A preliminary long list of general indicators, categorized by environmental media, is presented below, according to the four major media that constitutes the core of our framework of environmental quality.

4.1 Atmosphere

Automobile use, energy production, industrial processes, agricultural practices and solid waste incineration all result in the formation and release of air pollutants that have wide-ranging impacts on the atmosphere. Three main problems are of concern: outdoor air quality, acid rain and climate change (including stratospheric ozone depletion). Table 5.2 presents a preliminary long list of air indicators, broken down into these three categories.

4.2 Water

Water, including marine, coastal and fresh water (surface and groundwater), is both an essential element for ecosystem and human health, and a basic resource for most economic activities and processes. The preliminary long list of indicators presented in Table 5.3 reflects both the quality and the adequate availability of water resources.

Table 5.3
Environmental Indicators for Water

Category	Indicators
Water quality	BOD, TSS, nitrates, phosphates, ammonium, fecal coliform, organic toxics (PCBs, dioxins, etc.), heavy metals
Water supply	Withdrawal rates, use (groundwater and surface water, treated and untreated, by sector), replenishment rates



**Table 5.4
Environmental Indicators
for Land**

Category	Indicators
Soil quality	Soil organic matter, soil structure, salinization, desertification, erosion, soil contamination (by hazardous and non-hazardous wastes)

4.3 Land

Soil degradation is the most serious threat to the agricultural industry over the long term. Agricultural pesticides, acid rain from manufacturing processes, deforestation from over-harvesting of lumber, and poor waste-management practices both in petroleum and mineral exploration activities can adversely affect soil health. In certain parts of North America, soil erosion due to deforestation already contributes to pollution of local streams and lakes. On other parts of the continent, valuable agricultural land is lost each year to poor soil conditions. Shifting trade patterns under NAFTA, particularly those involving timber harvesting, agriculture or mining operations, could affect soil

health by advancing or slowing the rate of erosion, the level of salinity, or chemical contaminants contained in soil. Urban development spawned by NAFTA-led investment may also encroach on agricultural lands, affecting productive capacities. Finally, hazardous and solid-waste disposal arising from industrial activities can lead to widespread soil contamination. Table 5.4 presents a preliminary long list of soil indicators that includes indicators for the chemical, biological and physical properties of soils.

4.4 Biota

Biota refers to all forms of living organisms, including animals, plants and micro-organisms. Flora and fauna are adversely affected by the pollution of soils, water and atmosphere that result from industrial activities and intensive agriculture and forestry. The loss and fragmentation of forests and wildlands (either through non-sustainable harvesting or conversion to other land uses) also results in the loss of biodiversity. Animals and plants are an essential part of the environment and also serve as economic resources for human activities (e.g., cattle ranching or timber harvesting). Indicators should therefore

**Table 5.5
Environmental Indicators for Biota**

Category	Indicators
General	Species depletion (including flora and animals) Endemic species Number of species at risk (threatened and endangered) Loss and fragmentation of habitat (forests, wetlands, other wildlands) Rural to urban conversion of land Natural protected areas (area, quality, percent by type of ecoregion)
Forests	For each major forest type: forest cover, rate of deforestation, rate of afforestation, successful regeneration, standing volume, mean annual increment versus harvesting rates



reflect both aspects. Table 5.5 presents the preliminary long list of biotic indicators, both in general and with specific reference to the important forestry sector.

This section has presented a framework for environmental indicator development and a preliminary long list of environmental indicators to be considered for use in monitoring the environmental effects of the NAFTA. The next step is to undertake a detailed analysis of each of the general indicators in order to evaluate their viability and validity. Considerable work remains to be done in determining the extent to which the general indicators will need to be supplemented by additional sector-specific indicators for the individual sector studies.

VI. NAFTA AND THE ENVIRONMENT: GENERAL CONNECTING PROCESSES

In order to determine how changes in the ambient environment and its major indicators are caused by the NAFTA, it is necessary to specify the processes by which the NAFTA regime — as well as the trade and investment it creates — intensify or reduce stress on the environment, and provide or diminish resources to manage that stress in response. These processes can be traced from the particular sectors and firms involved in NAFTA-induced trade and investment, beginning with hypotheses about the likely environmental impacts of particular types of industry, supported by and extending to more specific findings based on interviews about the activities of the relevant firms. Such hypotheses and findings provide a foundation for the construction of a general framework of connecting processes.

This analysis of connecting processes begins by identifying how and why the three different types of industries (engi-

neering, branded goods and standard goods) involved in the NAFTA investment and trade, as identified in Section IV(4), will create stress on, and support for, the environment in varying ways.

In the first category of industry — the engineering sector — trade is likely to increase, road traffic will rise, and so will fuel emissions. This effect is likely to be offset to some degree by the more modern and efficient production and performance of the products that become accessible to the buyers of the market. These include electrical appliances that consume less energy or capital goods that incorporate the latest technology of the home country, transferred through the product to the host country. Trade-intensive engineering industries in general will benefit the environment as long as the technology they incorporate in the new plants is modern and the production of products such as cars, incorporate emission controls as advanced as those of the host country. The effect on the environment is, therefore, likely to be positive to neutral in these trade-intensive industries.

In the second category — branded goods — NAFTA is likely to increase consumption by making more goods available at lower prices. The effect on the environment is likely to be neutral to negative, owing to the greater content of plastics and non-degradable materials used in such products, as well as the increase in road transport.

With the third category — standard products — firms will tend to invest where the major activity is located. As American producers of steel, glass and some chemicals tend to divest or not to expand as fast as demand grows, it is probable Mexican investment that will rise. FDI is likely to participate only marginally, as most of the Mexican producers have so far made investments



alone. There will be sectors of standard products, however, where deregulation in Mexico will open up opportunities and FDI will flow. One is natural gas, where demand is likely to grow at an accelerated pace. The impact of standard sectors on the environment is likely to be neutral or negative, as most of these industries are polluting ones. This, however, must be weighted against the use of cleaner fuels, such as gas, that are likely to penetrate the market of Mexican producers and reduce pollution. It must also be weighted against the possibility that in the absence of NAFTA, Mexican producers of standard materials would have continued to expand in order to maintain exports to the United States or the rest of the world, without the environmental rules of NAFTA. Such rules, at least in some degree, will tend to force producers to adapt newer technologies. Much investment in standard-material industries will most likely continue to deplete natural resources, such as mineral, stone, sand and salt deposits.

More specific data about the environmental records and impacts of these types of industry can be obtained from interviews with knowledgeable individuals within, and outside, the major firms. More specifically, information can be learned from the key decision makers in the corporations, communities, societies and governments. Several interviews conducted in late 1995 with relevant individuals in major companies in Mexico, provide some initial suggestions of patterns. It is clear that environmental regulations and increases in environmentally-related processes and equipment occurred in the companies far before the onset of NAFTA, beginning as early as the 1980s, when Mexican environmental laws changed. Only small increases in overall investment for most of the companies were destined for

environmental improvements. Most of the increases were designed to increase international competitiveness and efficiency, rather than to respond to NAFTA. Changes in company structure were minimal, with most companies adding an environmental manager and establishing an ecology committee after the implementation of NAFTA in 1994.

In general, MNCs implement new processes with the latest technology and product standards in their subsidiaries abroad, as part of company-wide policies of uniform standards. Thus, subsidiaries of MNCs in Mexico report having imported advanced machinery and environmental processes. Domestic producers have adopted improved environmental controls as a result of the modernization of their plants as well as greater awareness that environmental regulations will be more strictly applied.

Additionally, the pollution emitted by MNCs is relatively manageable, often causing wastewater or scraps of metal that require water-treatment facilities and specific deposits for physical waste. The pollution emitted by domestic producers is likely to be more difficult to manage, as activities such as steel, cement, chemicals and metals involve more pollutants. Large domestic producers are adapting to improved environmental standards, but the greater volume of output suggests some possible net increase in emissions.

All expansions planned by the companies interviewed included measures to deal with the increase in pollution. Minor changes in company structures occurred in most of the companies after 1991 or the post-NAFTA period. In particular, Mexican companies mentioned the following changes as a result of increasing concern about the environment:



- their investment plans include more investment for anti-pollution equipment;
- their products are more environmentally friendly as they now often may become vulnerable to anti-pollution cases raised by consumers, the authorities, competitors, or foreign markets;
- their processes now require greater attention to anti-pollution techniques; and
- their costs rise, as introducing a new environmental regime renders much of the production non-competitive. This may be one reason why the Government of Mexico has allowed producers to effect an accelerated depreciation of anti-pollution equipment over the last two years.

Thus, it is evident from the preliminary interview program that in the post-NAFTA era, changes in the environmental behaviour of firms (in Mexico) embrace not only physical emissions (waste, water and metal) but extend to their production processes (firm structure, management standards, processes and technology, environmental equipment and controls), their relationship with consumers and social groups (in increasing output to meet demand and providing more environmentally friendly products), and their relationship with governments (which generate both regulatory demands, provide infrastructure and offer support through the tax system). This suggests the value of building a general framework of connecting processes based on the four pillars of production (in the private, commercial and public sectors): physical infrastructure (for transportation, emission and waste treatment, and natural resource input provision); social organization (including consumer behaviour, community rights, resources and bargaining activity, and outcomes); and government policy (relating to specific projects, broader laws and

regulation, and the transfer of resources between state and society). Such a framework embraces several types of decision makers who will be critical in determining NAFTA's environmental effects: owners, managers and workers within firms; their surrounding communities; their broadly dispersed consumers and involved interest groups; and government authorities at the federal, state and provincial and/or subnational level.

1. Production

The NAFTA-induced growth of economic activity in specific sectors, firms, plants and product lines, and the accompanying rapid population increase due to local immigration may increase overall demands on natural resources and the production of residues, excretes and emissions. However, at some locations, economic activity may decline due to human emigration, increasing competition or industrial displacement. In this case, the environmental benefits of reduced activity and human presence should be offset by the potentially negative consequences of declining investment in resource conservation and environmental maintenance and restoration.

By removing previous constraints to investment, changing the relative prices of investment and consumption, and generating larger competitive pressures especially on medium and small firms, NAFTA may have differing effects on the environmental equipment and technology employed by particular plants. It may change the degree and quality of environmental management systems, natural resource management systems and agricultural and forestry practices of specific firms and industry sectors. Effects may extend to the quantity and quality of the raw material and energy used by the plant, the efficiency of production, the quantity of residues and



emissions, and the impacts of the products and services produced.

More broadly, NAFTA may also have an important influence on the way North Americans evaluate the short- and long-term consequences of their actions. Access to new products and services, such as marketable food, medicines, energy and wood, and new economic activity in recreation, tourism, science and education, may change the direct value attributed to environmental components, within and across countries. Species and genetic diversity may lose its direct use value for local populations. In this case, failures in the ability of economic markets to apply the global values of natural services at the local level will have a very negative influence on biodiversity. Indirect values of ecosystem services (e.g., support of biological productivity, climate regulation, soil fertility maintenance and water and air cleansing) supporting economic activity may also vary as environmental distortions, risks, and externalities accumulate, and perceptions of environmental problems become more acute.

An increased value for environmental services may stem from deepened knowledge and appreciation of other countries' cultural values, while altruism toward future generations of environmental users may grow with the NAFTA-induced levels of welfare. Entrepreneurs' and managers' preferences, beliefs, management philosophies and attitudes towards people of other countries (including their discount rates and willingness to absorb the social costs of their actions) may change or be controlled through reputation effects, changing the pattern of coincidences or conflicts, both in norms and interests, between investors, workers and local communities. Depending on the perceived benefits and costs of the agreement, there may be changes in

consumer preferences and attitudes of local communities toward new or expanded foreign agricultural and industrial facilities.

2. Physical Infrastructure

The environmental impact of the production underlying the NAFTA-induced trade and investment activity critically depends on the surrounding physical infrastructure. This infrastructure is itself undergoing change as a result of processes unleashed in NAFTA. Most immediately, NAFTA-induced trade will intensify the use of, and demand for, transportation networks. This will not only happen at key nodes or bottlenecks (for example, along the US-Mexico border), but throughout the full expanse of the NAFTA region, from southern Mexico to northern Canada. More broadly, the elimination of subsidies in urban infrastructure (e.g., roads and water utilities) may drive investment to Mexico, as entrepreneurs from the United States and Canada seek investment opportunities and access to cheaper products and services. Here, one would expect the public or private development of supporting infrastructure of transportation, energy, water and land stocks, and sewage. Infrastructure projects such as roads and irrigation systems will have environmental effects that extend far beyond the physical displacement of natural environments and any associated spillovers, to include demographic effects.

There may also be changes in the form and degree of intervention in environmental structures and processes. This would include the amount and efficiency of resource extraction and landscape transformation for infrastructure development; the methods of habitat conservation and restoration; and intervention in the processes of maintenance, reproduction,



evolution and extinction of the component elements of ecosystems.

A reduction in public investment may, however, restrict these opportunities, thus decreasing new flows of capital. The ability of firms to use existing production processes, installed capacity and infrastructure (including recycling systems) will be important, as will the capacity and willingness of workers to make decisions, and their techniques (human capital). Investment flows will also depend on the availability of reliable information and expected transactions costs.

3. Social Organization

The influence of NAFTA on the environment will depend decisively on the broader institutional structure in which it operates. Ill-defined property rights, externalities and market failure might cause economic growth to exacerbate intertemporal and spatial resource misallocation. Investors may establish bargaining relations with local economic and political leaders, and local communities may be displaced and deprived of their customary rights of access to resources, even though by their very presence or specialized knowledge, traditions and self-interest, they may be the most cost-effective managers of natural resources. However, in the presence of strong community structures, NAFTA may increase the resources allocated for the development of more efficient systems of cooperation (e.g., joint ventures with national and international environmental non governmental organizations (ENGOS), organizations of indigenous associations and information nets. NAFTA may also strengthen their role as providers of public goods, human and social capital, organizational expertise, information, and credit.

More generally, NAFTA will also have a major influence on the economic institutions that determine the scale and organization of property, production and exchange. Through these, NAFTA also influences the ability of economic markets to recognize the true value of natural services, apply the global values of natural services at the local level, and regulate human action influencing the environment. Changes in the relative prices of factors of production as well as in the structure of transaction costs may reallocate investment flows that define the nature and functioning of collective economic actors. These include: households; productive and professional associations and joint ventures; new community groups; and grassroots organizations. Other economic actors include the scale and form of market imperfections and failures; the structure of incentives; the degree of cooperative participation, social coordination and collective action in the management of resources; the patterns of externality internalization; and the provision of public goods.

In some cases, NAFTA may help recognize the true value of environmental services. New investment may be allocated to increase profit margins, and provide incentives for improved soil, water and forestry management systems. Not all investment, however, will be directed to internalizing potential externalities arising from new and more intense economic activity. In these cases, the gap between the private profit to be gained from transforming a habitat or exploiting a species and its cost for the society may widen. This leads to over-exploitation of resources and habitat mismanagement, together with welfare losses.



4. Government Policy

NAFTA may not only influence the microeconomic and institutional resource allocation process. But it may also affect government constituencies and operations, with attendant influences on the production process. Lobbying activities of economic agents may directly influence project-related policy, which may become a source of market distortion and environmental problems. However, the policy effects of NAFTA are more likely to be indirect, resulting from governments' responses to expected or actual effects of increased economic activity. In this way, the existence of NAFTA will help shape the laws and regulations governing private decision-making, including trade policies, protective legislation, regulation and compliance, restrictive association and fiscal incentives.

More broadly, a state's withdrawal from economic activity in anticipation of or response to NAFTA may leave sectors of the population exposed to institutional gaps and market failures. Such exposure may produce or sustain poverty and result in new pressures on the environment. Ecological degradation of resources will, in turn, worsen the condition of the poor as it limits the potential productivity of the land and constrains future development options. State withdrawal may be accompanied, however, by institutional reforms that provide opportunities to stabilize income formation for the poor. These opportunities include: public-sector reorganization and explicit support to organized producers through financial institutions, development services and social welfare agencies; changes in the land tenure laws, which free the poor from government controls, give flexibility to resource transactions, and promote contracts with external agents; and a

greater effectiveness of independent producers' organizations and NGOs. Survival of poor sectors in the transition period will depend on their ability to effectively take advantage of these opportunities, secure access to productive factors, overcome government failure and biases in the distribution of public resources, and organize effective local governance systems.

VII. CONCLUSION: FUTURE RESEARCH DIRECTIONS

This study was designed to identify the basic building blocks — the key variables, relationships, indicators and data — required to construct a framework for assessing the environmental effects of NAFTA. It was not intended to generate findings about these effects, particularly since no adequate framework or method yet exists for doing so. Moreover, two years after NAFTA came into force is still too early for its major effects to become clear. Yet the results obtained from the preliminary analyses conducted for this study provide important guidance as the project moves from basic to more advanced analytic design. Five broad directions are discussed below.

1. NAFTA as a Living Regime

There is a clear requirement for a comprehensive conception of NAFTA as a living regime that first came into being as early as 1990, and that continues to evolve and expand into the future. The data on investment flows, and from the Mexican corporate and general interviews show how investors anticipated, and acted upon, the prospect of NAFTA from 1990 onward, when the Agreement was first contemplated. It further indicates, in the trade and investment patterns of engineering, consumer and standard industries, the varying importance of



NAFTA-specific provisions for rules of origin, tariffs, intellectual property, investment, textile, continuing protection in telecommunications, culture, marine transport, and Mexican energy and banking, as well as other NAFTA-induced national government moves towards investment liberalization.

As time passes, it is probable that the impact of these initial anticipatory elements and even economic rule changes will fade. Thus, the salient features of the NAFTA regime will increasingly become the operation of the dispute settlement mechanisms, intergovernmental institutions, and national government policy harmonization and cooperation. Particularly because very little is known about these latter elements, it will be important in the next phase of the project to complete an updated inventory of cases, institutions and activities, and to identify both deductively and inductively their probable impacts on trade, investment and environmental activity. Of particular importance is a detailed examination of the dozens of new NAFTA intergovernmental institutions, whose economic and environmental activities are likely to have an important effect. The concepts of regime theory suggest a way of monitoring their activities (particularly the environmentally-related behaviour of the economic bodies) and assessing their effects on the expectations and behaviour of relevant actors. A starting hypothesis would be that those functional and geographic areas of institutional focus in mandate, priorities, work program emphasis, budgetary allocations, expert capacity and public visibility are those where the greatest improvements in physical environmental quality will take place. There is also a need for selective analysis of national government decision making, to verify that important pre-and post-NAFTA policy changes were, at least

in part, propelled by considerations relating to NAFTA.

2. Impacts of NAFTA's Trade and Investment Effects

There are solid grounds for continuing to focus within a broader framework on NAFTA's trade and investment effects, and their subsequent impacts on the environment. Despite the powerful offsetting macroeconomic influences of the Mexican peso and subsequent economic crisis in 1995, the autonomous trade impact of the NAFTA regime is evident in the higher Mexican capital and intermediate good imports in 1995 compared to 1994; in the higher exports from the United States to Mexico in 1995 than in 1993; and in the higher exports from Canada to Mexico in 1995 than in 1994. Similarly, in the realm of direct foreign investment, rising American flows into Mexico and Canada in 1994, Canadian increases in Mexico between 1992 to 1994, and Mexican increases into the United States in 1994, point to NAFTA's immediate potent effects.

Despite the devaluation of the peso and economic crisis, Canada's increasing DFI in Mexico in 1994, point again to the importance of the NAFTA regime, not as a narrow set of changes to economic rules, but as a broader process of intensifying community formation. They also underscore the need for a balanced approach that embraces the activities of all three NAFTA countries. All three have experienced significant post-NAFTA increases in exports to at least one of the other parties. And while the Canadian-Mexican arm of the NAFTA trade and investment triangle is much smaller than the other two, the exceptionally large percentage increases in it during the post-NAFTA period suggests that it will reveal the purest form of the distinc-



tive NAFTA effects. Given NAFTA's economic rule changes, there is no reason to devote priority attention to the *maquiladoras*. However such attention could usefully be given to services, which represent an important (and probably growing) portion of intra-NAFTA trade and investment, which are generally thought to be more environmentally benign than their equivalents in goods.

3. Mapping the NAFTA Trade-Investment-Pollution Link

Further work is required in mapping the NAFTA trade-investment-pollution link. Indeed, the key analytic challenge of the next stage is to link particular dimensions of the NAFTA regime to subsequent trade and investment activity far more directly and dynamically, and to the many ways in which the involved companies, communities, consumers and governments create stress on and support for the environment. Here an initial and relatively easy task is to systematically relate particular NAFTA tariff reductions and trade barrier liberalization with trade increases in particular sectors (across the entire NAFTA economy), and to assess the pollution intensity of those sectors (through IPPS scores and, perhaps, data on the older measure of pollution abatement equipment expenditures). Recognizing that there is no one-to-one link between trade activity and environmental impacts, this analysis could still be useful in suggesting whether NAFTA is increasing trade (and thus economic activity) in pollution-intensive sectors. Ideally, one would also develop measures of, and data for, service sectors. With somewhat more difficulty, one

could also conduct a similar analysis for FDI, after matching data on FDI stocks and flows into the three NAFTA countries with ISIC categories to enable a correlation with IPPS scores. In both cases, the analyses should compare intra-NAFTA flows with those the three participants undertake with the rest of the world (some portion of which may be NAFTA-induced), and those that otherwise equivalent, non-NAFTA countries undertake among themselves.²⁵

4. Testing the "Pollution-haven" Hypothesis

As part of the above analysis, one could more directly test the longstanding "pollution haven" hypothesis. This could be accomplished by developing an inventory of firms that have transferred production activity from one jurisdiction to another (through FDI or product line expansion); determining which transferees have high pollution intensities and environmental-natural resource costs; assessing what other systematically operating factors (such as labour costs) affect such transferees; and determining if the transfers of such activity are from jurisdictions of high to low environmental standards/enforcement, low-cost natural resource availability, or low levels of waste treatment and other environmental infrastructure.

It would be most desirable if the above analyses could take place, not at the level of general sectors, but at those of individual firms.²⁶ This offers a statistical advantage by greatly increasing the number of available cases and by providing the detail required to trace processes of causation

²⁵ If one could identify sectors that have very low IPPS scores, but that possess a high trade potential, where the existing NAFTA regime provides little liberalization, one could then explore the advantages and prospects of accelerated tariff reductions on these "green" sectors, or identify other policies that could encourage their transborder expansion.

²⁶ This firm-level approach, and a reliance on interview research, will vary by sector. For example, 50 firms in Canada generate an estimated 50 percent-plus of its exports, while the Mexican energy sector is heavily concentrated in a few state-owned companies.



more convincingly. It also could provide the basis for a dialogue, not only with the industry associations embracing entire sectors, but with the owners and managers of individual firms whose behaviour was felt to be exemplary or problematic. Firm-level data would also better identify high impact areas — those geographic locales where NAFTA-induced trade and investment production is concentrated, and where the related dynamics of transportation and infrastructure development along with community activity could be more readily assessed. Such firm-centric analysis is more relevant to some sectors than others, and must be undertaken within a full framework of surrounding social and political processes.

One method of securing firm-level data is to examine the annual reports and other public information provided by or about the relevant companies. This data should provide information about their awareness of and reactions to NAFTA, their trade and investment in the NAFTA area, their environmental management and production processes, their suppliers, products and consumers, as well as their waste disposal and remediation activities.

However, to secure the required firm-level data, it would be most useful to design and conduct a systematic interview program, either through survey research, or through specialized face-to-face interviews with critical actors. Such interviews, beginning within the corporate community, would first seek to confirm the relevance of NAFTA to subsequent activity, and to determine which dimensions and elements of NAFTA affected which elements of corporate behaviour to what degree. It would further seek to identify changes in the company's production and management processes, its raw material sources and product lifecycles, its emissions and waste record, its provi-

sion and use of local infrastructure and transportation grids, and its community and government relations. Surveys could be conducted directly by the CEC itself, through professional third parties using dedicated questionnaires or, most desirably, in partnership with organizations with a proven record and reservoir of trust with the respondent community.

There are several additional ways to determine, and thus independently confirm, interview reported data. For example, goods crossing the border with a NAFTA certificate of origin, as well as the companies that export them, could be scored as NAFTA products and firms. This could be done based on the grounds that NAFTA's rules of origin are of sufficient commercial relevance to warrant the additional transaction costs of securing such certification. Those firms certified as eligible for the American Government's NAFTA Adjustment Assistance Program could be similarly categorized, despite the imperfections in it. Self-reported environmental activity could be compared with firm-level, publicly-available data (such as the IPPS, the US TRI and its Canadian and Mexican equivalents). ENGOs, union, community and indigenous groups would have a vital role in providing reputational assessments, anecdotal evidence and directly acquired data on priority firms. International company performance and compliance data could be analyzed by the CEC, along with member governments which can secure access to such data on a confidential basis.

5. NAFTA-induced Stresses on and Support for the Environment

A priority need is to develop a more elaborate conception of which of the NAFTA-induced connecting processes create the greatest stress on, and support



for, the environment, as well as the way these stresses and supports accumulate and interact with other forces to challenge the stability of existing ecosystems. As this framework is developed, it will be important to extract a short list of environmental indicators most affected by NAFTA-induced processes, so that the task of data acquisition and assessment can begin.

Given the magnitude of the analytic tasks involved, there are grounds for concentrating some of the available resources on detailed examinations of priority sectors. A sectoral focus would permit a more specific and interactive tracing of the complex economic, social, and physical environmental linkages. Moreover, while each sector has its unique features, a representative selection that included the major components of the NAFTA-affected North American economy would ensure that the need for a comprehensive framework is not lost. Finally, in practice NAFTA's environmental effects will most likely be particularly strong in specific sectors.

For these sectors, a systematic assessment of environmental effects will be necessary. This will require an environmental process framework and set of environmental indicators beyond those outlined in the general framework. Estimating the effects of changes in environmental conditions on humans and biota is often the most difficult task in using an environmental process framework, because it requires epidemiological and sociological studies.

These are difficult to conduct in a stress-response analysis for specific pollutants, i.e., going from the concentration of pollutants to determining exposures, doses and the ultimate health effects. However, such studies may be needed for sectors involving the use of toxic substances or pesticides. Different indices may be derived that can help compare the effects of diverse pollutants such as the IPPS does.

The analyses in this study suggest that it is possible to select a manageable set of sectors that meet several requirements. A concern with the absolute value of increases in post-NAFTA trade among the three countries, and the potential magnitude of environmental effects suggests a focus on the key sectors of automotive-transportation, petroleum and forest products. These constitute a major share of the exports and imports between all three NAFTA participants.²⁷ The data on FDI suggest that these sectors also represent significant new areas of activity in the post-NAFTA period. Moreover, as they are considered broadly to be the automotive-transportation, energy-petrochemicals and forestry sectors, taken together they offer an array that provides the required variation across engineering (automotive), consumer (some wood products) and standard (petroleum) industry categories; and across high-, medium- and low-IPPS scores. Moreover, all three sectors were the subject of important NAFTA provisions and subsequent trilateral activity, and are at the centre of current environmental concern.²⁸ Because most are highly

²⁷ A narrower concern with the proportional increases in trade from 1993 to 1994 would point to the sectors of: boilers and machinery; plastics; furniture; iron and steel; aluminum products; electrical machinery; optical and photographic equipment; aircraft and parts; wood pulp; paper products; and grain. Many of these can be included if the initial sector definitions are expanded to automotive-transportation, energy-petrochemical, and forest products respectively.

²⁸ Most notably forestry: while this sector is important in Canada-US trade and future transborder NAFTA flows, it is of vital significance to current environmental dynamics in all three countries.



concentrated sectors where relatively few firms account for the bulk of trade, investment and production activity, they allow for manageable firm-level analysis through specialized interview techniques.

To conclude, the Rio Declaration's message that responsible economic development

and environmental protection are mutually supportive has yet to be thoroughly tested. The NAFTA experience will provide some of the most reliable understandings of the dynamics of sustainable development to date. Thus, developing a careful understanding of that experience is a critical task.



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Appendix E: Biographical Notes for Speakers and Discussants

Laura K. Anderson

*Director for Trade and Environment
Office of the US Trade Representative
(USTR)*

Laura Anderson became the Director for Trade and Environment in the USTR in January, 1993. She is responsible for coordinating various aspects of American trade policy in relation to international environmental and natural resource issues. Ms. Anderson was responsible for the USTR's *Report on Environmental Issues in the NAFTA*, which was issued in October 1993, and the *Report on Environmental Issues in the Uruguay Round*, issued in August 1994.

From 1990 to 1992, Ms. Anderson was the USTR's Director for South Asia and the Pacific. In that capacity, she was responsible for American trade relations with Taiwan, Hong Kong, Australia, New Zealand and Pakistan. In particular, Ms. Anderson served as the chief American trade negotiator with Taiwan, concluding various agreements on market access and intellectual property protection.

From 1985 through 1989, Ms. Anderson served in the USTR's Office of Europe and the Mediterranean, where she was responsible for coordinating American trade policy toward the European Community (EC). In that capacity, she participated in negotiations leading to agreements resolving several different agricultural trade disputes. She was also a member of the American delegation to the GATT Working Party, which examined the accession of Spain and Portugal to the EC.

Prior to joining the USTR, Ms. Anderson held various positions within Import Administration at the US Department of Commerce (USDOC). She joined the

USDOC in 1982 as a Presidential Management Intern.

Ms. Anderson holds an MA in public affairs from Princeton University's Woodrow Wilson School, and a BA in Economics from Bryn Mawr College.

Juliet A. Bender

*Acting Director, Office of NAFTA
US Department of Commerce (USDOC)*

Juliet Bender has worked in the Office of NAFTA since February 1995. She is currently the Acting Director of the Office. In this capacity, Ms. Bender is responsible for ensuring implementation of the provisions of NAFTA and encouraging American companies to take advantage of NAFTA by exporting to Canada and Mexico. In addition, the Office tracks all bilateral policy issues relating to Canada and Mexico, and seeks advice from the American business community on these issues.

In June 1991, Ms. Bender joined the Office of Aerospace in the International Trade Administration. In this capacity, she was responsible for preparing USDOC positions and participating in international trade negotiations affecting the aerospace industry, as well as monitoring the GATT Agreement on Trade in Civil Aircraft. She was the former Director of the Aerospace Policy and Analysis Division.

Previous experience at the USDOC includes involvement in the Article 28 negotiations on Harmonized System conversion, participation in the market access negotiations for the FTA, as well as for the Uruguay Round.

Prior to joining the USDOC, Ms. Bender worked at the Federal Communications



Commission, where she was responsible for analyzing the international characteristics of the telecommunications industry. She also worked at NASA headquarters writing an historical summary of major daily aeronautical and astronomical events.

Ms. Bender received a BA in International Relations and German from the University of California, Davis, and an MA in International Affairs and Soviet/Eastern European Studies from the Johns Hopkins University School of Advanced International Studies.

Paul H. Boeker

President, Institute of the Americas (IOA)

Paul Boeker is the President of the IOA at the University of California, San Diego. The IOA is the leading institution in the western US, focusing on current economic and political issues in North American-Latin American relations.

Ambassador Boeker has authored and edited several books on Latin America and international economic relations. He is the author of *Lost Illusions: Latin America's Struggle for Democracy*, published in March, 1990. *Lost Illusions* is based on his interviews of 26 democratic leaders, including Oscar Arias of Costa Rica, Patricio Aylwin of Chile, Carlos Menem of Argentina, and Julio Sanguinetti of Uruguay. Ambassador Boeker is also the editor of *Latin America's Turnaround, Privatization, Foreign Investment and Growth*, published in March, 1993, by the International Center for Economic Growth.

Paul Boeker's February 1988 appointment to the IOA was widely applauded by several American and Latin American leaders, including Raúl Alfonsín, former

President of Argentina; former Secretary of State Cyrus Vance; and former Secretary of State George Schultz, who called Ambassador Boeker "one of the Department of State's top career diplomats".

Before coming to the Institute, Ambassador Boeker's diplomatic career spanned 27 years. He joined the Foreign Service in 1961 and served at posts in Germany and Colombia early in his career. He was appointed by former President Carter as Ambassador to Bolivia in 1977, returning to the US in 1980 to serve as Director of the Foreign Service Institute. In 1983, he joined the Secretary of State's Policy Planning Council. The following year, he was appointed by former President Reagan as Ambassador in the Kingdom of Jordan, where he served for three years before joining the American Delegation to the United Nations General Assembly. In 1974, he was appointed Deputy Assistant Secretary for International Finance and Development. In 1976, he became Senior Deputy Assistant Secretary for Economic and Business Affairs.

In 1975, Ambassador Boeker received the prestigious Arthur S. Fleming Award given annually to "ten outstanding young men and women in the Federal Government". In 1985, he received the Presidential Distinguished Service Award from former President Reagan. Ambassador Boeker is a member of the Council on Foreign Relations and was elected in 1990 to the American Academy of Diplomacy.

He graduated magna cum laude from Dartmouth College and received his MA in Economics from the University of Michigan, Ann Arbor. He is married to the former Margaret Macon Campbell. The Boeker's have three children.



Jorge A. Bustamante

*President, Border Environment
Cooperation Commission (BECC)*

Jorge Bustamante is a Mexican sociologist with a PhD from the University of Notre Dame, where he has also held an endowed Chair (Eugene Conley Professor of Sociology) since 1986. He is also the President of *El Colegio de la Frontera Norte*, a research and degree-granting institution located in Tijuana, Mexico. He has more than two hundred publications in scholarly journals in the US, France, Germany, Italy, Japan, Venezuela and Mexico. The majority of these deal with issues of Mexican immigration to the United States and the US-Mexico border. Dr. Bustamante has been quoted as a leading expert in the field of international migration by most major newspapers in the United States. He has also appeared on such TV programs as *Night Line*, *60 Minutes* and the *McNeil-Lehrer News Hour*.

Dr. Bustamante has been writing a weekly column in the editorial pages of *Excelsior* of Mexico for the last 12 years. His research on international migration was cited by former President Miguel de la Madrid of Mexico when he gave Dr. Bustamante the highest award the Mexican government grants to scientists, known as *Premio Nacional de Ciencias*, in 1988. He has been a faculty member of the University of Texas at Austin, *El Colegio de México* in Mexico City and the University of Notre Dame. As a visiting professor, Dr. Bustamante has been in charge of seminars and graduate courses at the University of California, Riverside, the *Universidad Nacional Autónoma de México (UNAM)*, National Autonomous University of Mexico, and the Institute of Political Science in Paris.

During 1994, Dr. Bustamante accepted the following appointments: Member of

the Joint Public Advisory Committee (JPAC) and Member of the BECC. These bodies were created by the governments of Mexico, the US and Canada as a result of the parallel agreements of the NAFTA. Following Mexico's membership into the OECD in May 1994, Dr. Bustamante was appointed by that organization as the SOPEMI (Continuous Reporting System on Migration) correspondent for Mexico. Dr. Bustamante continues to serve as the Coordinator of the Social Sciences Committee of the Council of Advisors on Science and Technology for the President of Mexico.

William M. Eichbaum

*Vice President, US Program, World
Wildlife Fund (WWF)*

In November 1989, Bill Eichbaum joined the WWF as a Senior Fellow. In January 1990, he became Vice President of the Environmental Quality Program of WWF, and in January 1991, Vice President of International Environmental Quality. His responsibilities include climate change, coastal environment, Central and Eastern Europe and the former Soviet Union, and global industrial policies. Since April 1995, Bill Eichbaum has been the Vice President, US Program at WWF.

Mr. Eichbaum is a co-founder and board member of the Moscow Centre for Energy Efficiency (CECEF), and was instrumental in the establishment of energy-efficiency centers in China, Poland and the Ukraine. With a grant from the MacArthur Foundation and participation of the World Bank, Battelle PNL, and the Socio-Ecological Union (SEU), he has established the Russia Biodiversity Project located in Moscow. He has been a key participant in the Second and Third International Conferences on Environmental Enforcement held in Budapest and Mexico, respec-



tively, as well as with the Environmental Law Institute's Conferences in Slovakia. He is a Committee member of WWF-International's European Program, and Chairman of the Marine Advisory Group and Russia Country Team.

Mr. Eichbaum has also been an active participant in a number of marine-related activities of the National Academy of Sciences, including a member of the Water Sciences and Technology Board and its Marine Board, Committee on Wastewater Management in Coastal Urban Areas, and Committee of the Polar Research Board, reviewing science needs in Antarctica. In addition, Mr. Eichbaum is a member of the Board of Directors of the Coastal Society and the Coastal Policy Roundtable, which is advisory to the Assistant Administrator for Ocean Services of National Oceanic and Atmospheric Administration (NOAA). He is adjunct faculty member of the Marine Sciences Research Center of the State University of New York, Stony Brook. He has also taught a seminar on the Law and Policy of the Coast at the Law School of the University of Maryland.

He is a graduate of Dartmouth College and Harvard Law School.

Peter Fawcett

*Deputy Director Environment Division
Department of Foreign Affairs and
International Trade (DFAIT)*

Peter Fawcett is the Deputy Director of the Environment Division, DFAIT, in Canada. He is responsible for international environmental conventions and agreements including the Framework Convention on Climate Change, the Montreal Protocol, Biodiversity, Basel Convention on Hazardous Waste and discussion of trade and the environment issues in the WTO and OECD.

From October 1993 to August 1995, he served as DFAIT's Deputy Director of the Multilateral Trade Institutions Division. His responsibilities included the implementation of the NAFTA and the North American Agreements on Environmental and Labour Cooperation, as well as federal-provincial relations on trade policy issues.

From August 1992 to October 1993, he was the Departmental Assistant to the Minister of International Trade. Responsibilities included the Uruguay Round of Multilateral Trade Negotiations, the NAFTA and bilateral trade issues including trade disputes with the US and the EC.

Between 1988 and 1992, he worked as Commercial Counselor at the Canadian Embassy in Washington, DC. Responsibilities included trade issues in agriculture, forestry and fishery involving the US and Canada and the Uruguay Round negotiations.

Peter Fawcett received a BA (with honours) in International Economics and Political Science from the McMaster University, Hamilton, Ontario and an MSc in Agriculture and Resource Economics from MacDonald College of McGill University, Montreal, Quebec.

Adrián A. Fernández Bremauntz

*Director General, Environmental
Management and Information Department
Instituto Nacional de Ecología
Secretaría de Medio Ambiente, Recursos
Naturales y Pesca*

Since the summer of 1995, Dr. Fernández Bremauntz has been the Director General of Environmental Management and Information at the National Institute of Ecology in Mexico. Prior to that, he was an Associate Researcher at the Faculty



of Medicine at the *Universidad Nacional Autónoma de México (UNAM)* and an Advisor to the President of the National Institute of Ecology.

He has taught at the John F. Kennedy School of Government at Harvard University and has been a speaker at a number of conferences on issues ranging from motor vehicle pollution, the measurement of toxic and related pollutants, and other issues of environment and economy.

He is the author or co-author of a number of publications including “A Survey of Commuter Travel Habits in the Metropolitan Area of Mexico City” (with J.Q. Merritt), and “An Assessment of Street Sellers’ Exposure to CO in Mexico City” (with M.R. Ashmore and J.Q. Merritt). Both of these publications were published by the *Journal of Exposure Analysis and Environmental Epidemiology*. He is also the author of “Mexico City: the Current State of Air Quality” published in *Urban Air Quality of Megacities of the World* by UNEP and WHO, and “Rapid Exposure Assessment Studies: Some Guidelines for Developing Countries”, found in the Final Report for the Robert McNamara Fellowships Program, The World Bank.

Dr. Fernández Bremauntz has a degree in Biology from the *Universidad Autónoma Metropolitana, Unidad Iztapalapa*. He holds master’s degrees in Applied Statistics and Environmental Technology in Mexico, and a PhD in Environmental Science from the Imperial College of Science, Technology and Medicine at the University of London. He has also done postgraduate work at the John F. Kennedy School of Government at Harvard University.

Sanford E. Gaines

*Associate Professor
University of Houston Law Center*

Sanford Gaines is an Associate Professor at the University of Houston Law Center, where he teaches in Environmental Law and Trade Law, and co-directs the school’s Mexican Legal Studies Program in Mexico City. He returned to his teaching duties in Houston in the fall of 1994 after a two-and-a-half year leave of absence to serve as the Deputy Assistant US Trade Representative for Environment and Natural Resources at the USTR in the Executive Office of the President. During his time at the USTR, Professor Gaines had major responsibility for environmental issues in the negotiation of NAFTA, the environmental side agreements to NAFTA, and the Uruguay Round agreements in the GATT. He has been a consultant to the North American Commission for Environmental Cooperation and to some US environmental organizations, and has been appointed to the UN Environment Program Expert Group on International Environmental Agreements and Trade.

Before joining the University of Houston Faculty of Law in 1986, Professor Gaines had a varied career as an environmental lawyer, including a year at the Environmental Law Institute, nearly three years as an Enforcement Attorney at the US EPA regional office in Boston, and five years as assistant general counsel at the Chemical Manufacturers’ Association. He is a graduate of Harvard College and Harvard Law School. He also has a master’s degree from Harvard in East Asian Regional Studies, an outgrowth of his tour of duty as a Peace Corps volunteer in Korea in the late 1960s.



José Raúl García Barrios

Centro de Investigación y Docencia Económicas A.C. (CIDE)

Raúl García Barrios is the Coordinator of the Study Group on Rural Economic Institutions and the Management of Environmental Resources at the CIDE.

Prior to taking up this post, he taught a number of courses at CIDE, including Environment and Natural Resource Economics and a seminar entitled “A Social Analysis of Environmental Change”, as well as courses on theoretical and institutional aspects of economics. Dr. García has also taught Biology at the *Universidad Autónoma de México* and, at the beginning of his career, taught both History and Biology at the elementary school level.

Dr. García received his BA in Biology from the *Universidad Autónoma de México*, his MA in Economics from the Center for Economic Studies at *El Colegio de México* and his PhD in Agricultural and Natural Resource Economics from the Department of Agricultural and Natural Resource Economics at the University of California, Berkeley. His doctoral thesis was entitled *Institutional Change and Indigenous Behaviour: New Theoretical and Empirical Approaches*.

Adalberto García Rocha

*Director, Centre for Economic Studies
El Colegio de México*

Adalberto García Rocha has been the Director of the Centre for Studies in Economics at *El Colegio de México* since 1988. He has been a Professor-researcher at *El Colegio de México* since 1967, where he has taught courses on mathematics, statistics, and econometrics.

Between 1980 and 1982, he was a member of the Executive of the National Program

of Social Sciences. From 1978 to 1982, he taught a course on Income Distribution at the *Instituto Tecnológico Autónomo de México*. Prior to that, Dr. García Rocha was the Academic Coordinator at the Centre for Economic Studies. He has also served as an Advisor to the Department of Economic Studies at *Banamex*.

Dr. García Rocha has published widely on issues related to the Mexican economy. His most recent publications include: “*Regionalización de las Relaciones Económicas Mexicanas y Estrategia de Diversificación Internacional*” in *México en El Cambio*, (México: Fundación Konrad Adenauer, 1992); “Mexican Discrepancies”, in Dobell and Neufeld (eds.), *Learning for Life*, (Canada: Oolichan Books, 1992); “*La Economía y el Comercio en el proceso de Universalización*”, *III Simposium Internacional Humanismo y Sociedad, Los valores humanos en el proceso de universalización*, (México: Sociedad Internacional Pro-valores Humanos, E. Fromm and S. Subirán, 1991); “*Equidad y Eficiencia de la Educación Pública en México*”, (México: CONAFE, Num. 1, 1991); “Note on Mexican Economic Development and Income Distribution”, *Latin American Report*, Vol. 7, No. 1, 1990 (Tokyo: Institute of Developing Economies); “Economics of Labour Standards and Wages in Mexico”, in Herzenberg and Pérez-López (eds.), *Labour Standards and Development in the Global Economy*, (Washington, DC: US Department of Labour and Bureau of International Labour Affairs, 1990); and, “Distributive Effects of Financial Policies in Mexico”, in Brothers and Wick (eds.), *Mexico’s Search for a New Development Strategy*, (USA: Westview Press Inc., 1990).

Dr. García Rocha received a degree in Civil Engineering from the University of Guadalajara and did his doctoral studies at Stanford University’s Food Research Institute.



Pierre-Marc Johnson

Counsel, Heenan Blaikie

Pierre-Marc Johnson is a lawyer and a medical doctor. He is also a former Premier of the Province of Quebec.

Dr. Johnson currently practices law at the Montreal firm of Heenan Blaikie where he acts as counsel on public policy issues and commercial negotiations. He is also a Professor of Law at McGill University in Montreal.

Dr. Johnson has extensive international experience on issues of sustainable development. In 1992 he was a Special Advisor to the Secretary General of the United Nations Conference on Environment and Development in Rio de Janeiro. Since then he has been a Special Advisor to the Chair of the United Nations Conference on Desertification, and continues to play an active role in the implementation of the Treaty on Desertification.

Dr. Johnson is a founding member and Vice-chair of the NRTEE, an advisory body to the Prime Minister of Canada on sustainable development and, since its inception, he has chaired its Committee on Foreign Policy. He is also a member of the board of the Mexican-based Environmental Education and Training Institute of North America, and a Fellow of the Royal Society of Canada.

Among his corporate affiliations, Dr. Johnson is a Director and member of the Executive Committee of SNC-Lavalin, a member of the boards of Unimedia (Hollinger Quebec), le Groupe Conseil Innovitech (Montreal) and CCUM (Lyonnaise des eaux-Montreal).

Dr. Johnson has published extensively on issues of sustainable development and the relationship between trade and the

environment. His most recent book is entitled *NAFTA and the Environment: New Continental Law* (Washington, DC: Island Press, 1996).

Richard A. Kamp

Director, Border Ecology Project Inc.

Dick Kamp is the Director and Founder of Border Ecology Project, Inc., (BEP), a small non-profit binational research and advocacy group located in Bisbee, Arizona. BEP was founded in 1983 to advocate and develop an American-Mexican copper-smelter air pollution accord. Since the signing of the La Paz Agreement, Annex IV in 1987, BEP and Mr. Kamp have broadened their activities to address a variety of environmental and health issues in both the border region and the interior of Mexico. These include general advocacy of progressive transnational investment practices, on-site studies and inventories of *maquiladora* hazardous material and waste use, surface and groundwater depletion and contamination, air pollution monitoring, emergency planning and community right-to-know in northern Mexico, and policy research on the NAFTA and its side environmental accord.

Mr. Kamp is a member of *La Red Fronteriza de Salud y Ambiente* (Border Health and Environment Network) and the Northeast Sonora Cochise County Environmental Health Council. He was awarded the 1991 United Nations Environment Program Youth Forum Award for furthering the cause of global conservation. Mr. Kamp has testified frequently before both American and Mexican regulatory and congressional committees on binational environmental issues. He regularly sponsors and coordinates local fora so as to develop regional strategies aimed at solving environmental and developmental problems. During 1994, at the request of the Peruvian



Mayors and NGOs, Mr. Kamp began an assessment of environmental problems related to mining in Peru.

Mr. Kamp has published widely on issues related to his work. Among his publications are: "Recommendations Concerning Mining Impact in the Ilo and Río Mantaro Regions of Peru" (1994); "Environmental Protection with the Mexican Mining Sector and the Impact of World Bank Mining Loan #3359", (with Geof Land and Kate McCafferty, 1994); "Environmental and Health Issues in the Interior of Mexico: Options for Transnational Safeguards", (with Laura Durazo and Geof Land, 1993); "Protecting Health and Environment in Mexico in a NAFTA", (1992); "Structuring Environmental Protection into Free Trade", (with Michael Gregory, 1991); "Environmental Impacts of US-Mexico Free Trade", (with Mary Kelly and Michael Gregory, 1992); "US-Mexico Border Environmental Problems", (for the Center for Strategic and International Studies, 1989); and "Inventory of Hazardous Material Use in Maquiladoras", (with Michael Gregory, 1988).

Mr. Kamp is a graduate of Prescott College.

Mary E. Kelly

Executive Director, Texas Center for Policy Studies

Mary Kelly received a BSc (with honours) in chemical engineering from the University of Arizona in 1979. After four years as an engineer with Radian Corporation, an environmental consulting firm, she obtained a law degree from the University of Texas, working for the Environmental Protection Division of the Texas Attorney General's Office throughout law school. In 1986, she joined the firm of Henry & Lowerre, representing citizen groups throughout Texas on a wide variety of environmental matters. She became a

partner in that law firm in 1987, and now serves "of counsel" to the firm.

Since 1989, Ms. Kelly has been the Executive Director of the Texas Center for Policy Studies, a non-profit organization based in Austin. The Texas Center for Policy Studies provides research, policy and technical assistance on a wide variety of environmental issues. Ms. Kelly has specialized in Texas-Mexico border issues and the environmental implications of the NAFTA for the past five years. She currently serves as Chair of the US National Advisory Committee (NAC), established under the North American Agreement for Environmental Cooperation.

John J. Kirton

Department of Political Science, University of Toronto

John Kirton is an Associate Professor of Political Science, a Fellow of Trinity College, and a Research Associate of the Center for International Studies at the University of Toronto, where he has taught international relations since 1977. He received his PhD from the Johns Hopkins University School of Advanced International Studies in 1977, his MA from Carleton University's School of International Affairs in 1973, and his BA from the University of Toronto in 1971, graduating with a Woodrow Wilson Fellowship.

Dr. Kirton is currently Chair of the North American Standards Working Group, a multistakeholder group from the three NAFTA countries. Since 1989, he has been a member of the Foreign Policy Committee of the NRTEE, an advisory body on sustainable development to the Prime Minister of Canada. With the NRTEE, he has worked extensively on trade and environment issues including



analysis and advice on the environmental dimensions of the NAFTA, the Miami Summit of the Americas, APEC, and the Uruguay Round/World Trade Organization. In April 1995, he was appointed as a member of the Canadian Government's International Trade Advisory Committee. He is also the Vice President of Kirton Associates, a Canadian firm specializing in international investment, political risk and media analysis.

He is co-editor of the *Triangle of Pacific States, Building a New Global Order: Emerging Trends in International Security; Trade, Environment and Competitiveness: Sustaining Canada's Prosperity; Canadian Foreign Policy: Selected Cases; Canada and The New Internationalism; Canada the United States and Space; and The International Joint Commission Seventy Years On*. He is the co-author of "North American Environmental Relations" in *North American Outlook* and earlier conducted studies for the Canadian government on Canadian-Japanese investment and joint venture relationships. He is also the co-author of *Canada As a Principal Power: A Study in Foreign Policy and International Relations*.

Victor Lichtinger

*Executive Director
Commission for Environmental
Cooperation (CEC)*

Victor Lichtinger was appointed Executive Director of the CEC in April, 1994 by the governments of Canada, the US and Mexico. He brings to the Secretariat of the CEC a distinguished background of international, environmental and economic experience, gained in both the private and public sectors.

A native of Mexico, Mr. Lichtinger did his undergraduate work in Mexico and

undertook his graduate work in Economics at Stanford University. Prior to his appointment to the CEC, he was the General Director of ICF Kaiser in Mexico, a consulting company specializing in the environment.

Mr. Lichtinger's private-sector experience is balanced with public-sector positions related to the environment. He was the General Coordinator of Mexican delegations to a number of international bodies, including the United Nations Conference on Environment and Development in Rio de Janeiro, in 1992.

Andrés Lira González

President, El Colegio de México

Andrés Lira has had a long career as an academic. He has been a professor at the National School of Anthropology and History, has taught in the Faculty of Philosophy and Literature at the *Universidad Nacional Autónoma de México*, and in both the History and Anthropology Departments of the *Universidad Iberoamericana*. As a Professor and Researcher, he has worked primarily at the Center of Historic Studies at *El Colegio de México* (1969-1981), and in the Center of Historic Studies at *El Colegio de Michoacán* (1982-1993). In the latter institution, he served as the Coordinator of the Center of Historic Studies until 1985, at which point he became the President of *El Colegio de Michoacán* and later the Coordinator of the Social Sciences PhD program. In July 1993, Dr. Lira joined *El Colegio de México*. In January 1995, he was made responsible for the Center of Historic Studies and in September 1995, he became President of *El Colegio de México*.

As a researcher, Dr. Lira has worked on issues concerning Mexican juridical and



political ideas and institutions with the aim of analyzing them from the perspective of social history. Among his many publications are three books: *El amparo colonial y el juicio de amparo mexicano (Antecedentes novohispanos del juicio de amparo)*, published by the *Fondo de Cultura Económica* in 1972 and reprinted in 1979; *La creación del Distrito Federal*, edited by the Federal District Bureau in 1974; *Comunidades Indígenas frente a la Ciudad de México, Tenochtitlan y Tlaltelolco, sus pueblos y barrios, 1812-1919*, co-edited by *El Colegio de México*, *El Colegio de Michoacán* and *CONACYT* in 1983. He is the author of a number of chapters on government, economics and society, as well as music in the *Historia de México* published by Salvat in 1974, and reprinted on several occasions. Together with Luis Murillo, Dr. Lira is a co-author of the chapter “*El Siglo de la Integración*” of the *Historia General de México*, which appeared in 1976, and which has also been reprinted. Dr. Lira is also the author of many articles in his area of expertise.

Dr. Lira was born in Mexico City on July 8, 1941. He received his degree from the *Universidad Nacional Autónoma de México*, an MA in History from *El Colegio de México*, and PhD in Mexican history from the State University of New York, Stony Brook. As a student, Andrés Lira was awarded scholarships granted by *El Colegio de México*, the Ford Foundation and the State University of New York.

Virginia W. Maclaren

*Department of Geography and Planning,
University of Toronto*

Virginia Maclaren is an Associate Professor of Geography and Planning at the University of Toronto, where she teaches environmental planning, urban waste management, and environmental assessment.

She is the co-author of a major study on municipal environmental reporting in Canada, published by Environment Canada in 1995, and the author of a 1996 study published by ICURR Press on urban sustainability indicators. She is also the Associate Director of a five-year project, funded by the Canadian International Development Agency (CIDA), on environmental management and training in Vietnam. As part of this project, she is the principal advisor to a Vietnamese team that is developing methodologies for national, regional and urban environmental reporting in Vietnam.

Hector Márquez Solís

*Director General de Análisis y Seguimiento a Tratados Comerciales Internacionales
Secretaría de Comercio y Fomento Industrial (Secofi)*

Hector Márquez Solís received his Bachelor's Degree from the Faculty of Economics at the *Universidad Autónoma de Nuevo León*. He completed his doctoral studies in the area of Public Finance and Macroeconomics at the Department of Economics at Rochester University, Rochester, New York.

As an academic, Dr. Márquez has worked as a Professor of Economics in the Faculty of Political Science and Public Administration at the *Universidad Autónoma de Nuevo León*; as a teaching assistant in the Department of Economics at Rochester University, and as an Associate Professor and Researcher in the Faculty of Economics at the *Universidad Autónoma de Nuevo León*.

In the public sector, Dr. Márquez has worked in the Office for the Negotiation of the Free Trade Agreement at the *Secretaría de Comercio y Fomento Industrial (Secofi)*, Secretariat of Commerce



and Industrial Development. During the NAFTA negotiations, he was responsible for the automotive, pharmaceutical and electronic sectors. He was also responsible for the negotiations on rules of origin and tariffs. Later, he served as the Assistant Director General for Automotive, Textiles, Steel and Antidumping in the Directorate General of Implementation in the Sub-secretariat for International Trade Negotiations.

As the Director General of Analysis and Implementation for International Trade Agreements, Dr. Márquez is responsible for ensuring the proper implementation of the agreements signed by Mexico, for promoting their use, as well as for analyzing the opportunities they promote, and their effects. Dr. Márquez also remains the negotiator responsible for autos, textiles, steel and unfair trade practices.

Omar R. Maserá

Centro de Ecología, Universidad Nacional Autónoma de México (UNAM)

Omar Maserá is an Associate Professor at the *Centro de Ecología* at the UNAM, where he directs the Bioenergy Group. He holds a BA in Physics from UNAM, an MA and PhD in Energy and Resources from the University of California, Berkeley. Dr. Maserá's work is focused on renewable energy and forest resource management, technology innovation and evaluation, as well as the effects of deforestation and forest degradation on global climate change.

Prior to working at the *Centro de Ecología*, Dr. Maserá was an Associate Researcher at the International Energy Studies program of the Lawrence-Berkeley Laboratory at the University of California, and a Researcher at the Program for Science and technology at *El Colegio de México*.

He is also currently a member of the national ad hoc committees on Deforestation, Joint Implementation and on the Mexican Climate Change Action Plan which are all coordinated by the *Secretaría del Medio Ambiente, Recursos Naturales y Pesca (Semarnap)*. Dr. Maserá is the author of more than 30 publications, including one book, several articles in international journals, technical reports and articles directed at the general public. He has served as a consultant to the UNEP, the FCCC, the CEC and the ECLAC, and is a member of the Pugwash Conference on Science and World Affairs, which received the Nobel Peace Prize in 1995.

Robert J. Morris

Senior Vice President, United States Council for International Business

Robert Morris became the Washington Representative of the United States Council for International Business in September of 1985, and was named Senior Vice President, Washington in 1989. Prior to joining the Council, Mr. Morris had been a career foreign service officer of the United States. Before his retirement from the Service in 1985, he served as Deputy to the Under Secretary of State for Economic Affairs. During that time, he was also accorded the personal rank of Ambassador in connection with his work in 1983 coordinating US policy on East-West economic relations.

Mr. Morris entered the Foreign Service in 1960 after having served in the US Navy. During his career, he specialized in economic issues and the Western European region, with service abroad in Brussels at the US Mission to the European Communities (twice), as well as at the American embassies in Paris and London. His Washington assignments included service on the staff of the Council on



International Economic Policy at the White House in the early 1970s.

Colleen S. Morton

Vice President, Institute of the Americas (IOA)

Colleen Morton was appointed Vice President of the IOA in 1993. In 1995, the duties of Director of Research were added to her portfolio. Her primary responsibilities include overseeing Institute programs, research and outreach activities. In this capacity she has instituted a series of seminars on the NAFTA in San Diego in 1993 to educate the general public and has been a frequent speaker on the NAFTA and subsequent events in Mexico. She has overseen IOA programs relating to economic and political reform throughout the hemisphere and is the American Coordinator of the US-Mexico Environmental Business Committee. Her areas of expertise include trade and the environment, trade liberalization, infrastructure finance and the political economy of Mexico.

Prior to joining the IOA, Morton was the Executive Director of the US Council of the Mexico-US Business Committee and the Director of Mexico Programs for the Council of the Americas in Washington, DC. At the US Council, she was responsible for all NAFTA-related efforts, including extensive public speaking, coalition activities, Congressional and Federal Government Relations, environmental analysis, and analysis of the Agreement. She also provided analyses of Mexican affairs to Rodman Rockefeller and David Rockefeller.

Ms. Morton supervised the commissioning and production of the KPMG Peat Marwick modelling study of the NAFTA, along with numerous state analyses. She initiated

the ground-breaking study on border environmental infrastructure financing gaps, that contributed to the formation of the NADBank and the BECC. In these efforts, she worked closely with several Mexican business organizations, including *CEMAI* and *COECE*, the American Chamber of Commerce, *Canacindra*, and *Concamin*, as well as the Mexican Government.

She has testified on numerous occasions regarding the benefits of the NAFTA and closer relations with Mexico before the House and Senate Committees, the International Trade Commission, and was a frequent contributor to agency studies on labour, environmental and commercial impacts of the NAFTA. In her capacity as Director of Mexican Programs for the Council of the Americas, she organized and conducted numerous programs relating to Mexican affairs, including the enforcement of labour and environmental regulations, in addition to business opportunities in Mexico.

Prior to joining the US Council/Council of the Americas, Morton held a number of trade-related positions: as Trade Policy Analyst with the Washington office of the law firm, Weil, Gotshal & Manges; as Director of the Canadian-American Committee of the National Planning Association; as Editor of *Canada-US Outlook*; and as a Foreign Service Officer with the US Department of State. Her overseas postings as a political officer have included Venezuela, New Zealand and Canada.

Morton was the 1990 recipient of the Woman of the Year award from the Washington DC-based Women in International Trade. She has published on the topic of the NAFTA and the environment, specifically with regard to subsidies and the politics of trade; the trade opening



in Eastern Europe; the FTA; and environmental policy reform. Morton received her MA in International Political Economy from the University of Washington, and her BA in International Relations from Carleton College in Northfield, Minnesota.

Alfredo Phillips Olmedo

*President and Chief Executive Officer,
North American Development Bank*

Alfredo Phillips has enjoyed a long and distinguished career in the Mexican government. During that time, he also has served on a number of corporate boards and committees and co-authored several books on banking and foreign trade.

Mr. Phillips most recently served as Director General of the Institute of the National Fund for Housing for Workers in Mexico City, before being named Manager of the NADBank on January 30, 1995.

His career in government began in 1960 when he served as an advisor for the General Director of income tax in the Ministry of Finance. After two years with that agency, he was named Deputy Chief in the Department of Banks, Money and Investment, then Chief of the Department of Economic and Fiscal Planning.

In 1965, Mr. Phillips traveled to Washington, DC and took up a post as a Loan Officer with the IADB. In 1966 he was named Executive Director of the IMF, serving in that capacity for the next four years. His involvement in banking policy continued with his appointment as Manager and Deputy Director of the Bank of Mexico, overseeing international affairs from 1970 to 1982. Mr. Phillips also advised Mexico's Secretary of Finance on international affairs during that period. Concurrently, he also taught courses on

trade cycles at the Iberoamerican University in Mexico City for two years.

In 1982, Mr. Phillips became Director General of the National Bank of Foreign Trade of Mexico. In 1988, he was named a Vice President of the Mexican Bankers' Association and Chairman of the Board of *Fondo Editorial de la Plástica*.

Mr. Phillips was asked to serve as Ambassador to Canada from 1989 to 1991. From 1991 to 1992 he served as Ambassador to Japan. In 1992, he was named Undersecretary of Housing and Federal Properties under the Secretary of Social Development, Luis Donaldo Colosio, where he served until his move to the NADBank.

Mr. Phillips studied the humanities at the University of Mexico. He has a degree in economics at the University of London and did graduate work in public administration at George Washington University. Mr. Phillips has written extensively on banking and foreign trade for various academic journals.

Mr. Phillips was born on September 2, 1935, in Matamoros in the northern state of Tamaulipas. He is married to Maureen Greene de Phillips and has three children.

Jonathan Plaut

*Chair, Joint Public Advisory Committee
(JPAC)*

*Commission for Environmental
Cooperation (CEC)*

Until February, 1996, Jon Plaut was the director of environmental quality for Allied Signal Inc. During his distinguished career at Allied Signal Inc. (1966-1996), he was responsible for initiating and leading a number of important initiatives including



a corporate-wide global waste management process; a global health, safety and environmental program; and the Allied Signal Mexican compliance program and Mexican environmental shared-resource program.

Mr. Plaut is one of the five American members of the JPAC under the environmental side agreement to the NAFTA, and in 1996 was elected by his peers to chair this Committee.

Among his many other activities in government and the private sector, Mr. Plaut serves as Chair of the United States Council of International Business Environmental Committee. He was Co-chairman of the International Chamber of Commerce's delegation at the Earth Summit in Rio de Janeiro in 1992. He is a past Vice President of the EPA's National Advisory Committee on Trade and Environment.

Mr. Plaut has been a keynote speaker on a number of conferences and workshops and has written widely on the management of toxic substances, environmental regulation, international environmental issues, and the relationship between trade and environment, among other issues related to the environment and the economy. He has lectured at institutions including Tufts University and the Harvard Graduate School of Business (1980-1995) and is currently a Visiting Lecturer (Environment and Public Policy) at Penn State University.

Mr. Plaut received his engineering degree from Penn. State U. He also holds a J.D. from Georgetown University School of Law, and both a Master of Laws and an MA from New York University.

Rogelio Ramírez de la O.

President, Ecanal, S.A. de C.V.

Rogelio Ramírez de la O. holds a PhD in Economics from Fitzwilliam College at

Cambridge University, and a BA in Economics from the National Autonomous University of Mexico. His specialization and doctoral dissertation was on international trade and foreign direct investment in Mexico. He has published works on both investment and trade, as well as Mexican economic policy.

He is the sole partner and president of *Ecanal, S.A. de C.V.* (Economic Analysis for Company Planning), a firm whose clients include some of the largest multinational firms. *Ecanal* publishes the monthly *Economic Report on Mexico*, and has been publishing the quarterly *Special Report on Mexico* since it was founded in 1977 by the British economist, the late Dr. Rodvers Opio.

Before joining *Ecanal*, Dr. Ramírez worked for two years at the United Nations Center on Transnational Corporations on issues of balance of payments and on intra-firm international trade.

He is member of several professional associations in the US and Europe, is advisor to top management of several multinational firms and a trustee of the University of the Americas.

Ian D. Rutherford

Director General, State of the Environment Reporting, Environment Canada

Ian Rutherford is responsible for the overall direction of Canada's State of the Environment Reporting program. Canada pioneered the issuing of comprehensive national SOE reports every five years and more frequent environmental indicator bulletins for specific environmental issues. The Canadian pressure-state-response framework to link environmental impacts with human economic activities and societal responses, has been widely adopted in other countries and by international



organizations such as the OECD and the UN Commission for Sustainable Development. The most recent report on the State of Canada's Environment (1996) is being released as an electronic product on the Internet's World Wide Web. It pioneers the systematic use of a geographical ecosystem framework coupled with a pressure-state-response approach, in order to draw conclusions about the sustainability of human activities in the eco-zones of Canada.

Dr. Rutherford obtained his BA and MSc in Physics from the University of Toronto, as well as a PhD in Meteorology from McGill University in Montreal. He has been active in both the Canadian and Meteorological and Oceanographic Society (CMOS), serving as Editor of the CMOS journal *Atmosphere-Ocean*. He is also active in the American Meteorological Society, serving as a member of both the Council and the Executive. He has represented Canada at the World Meteorological Organization, the Working Group on Numerical Experimentation of the Global Atmospheric Research Project, and the International Association of Meteorology and Atmospheric Physics.

Previous appointments include Director General of Atmospheric Research, Director General of Weather Services, and Director General of National Parks. He led the Canadian delegation to the 1990 General Assembly of the World Conservation Union (IUCN) and the World Heritage Committee of UNESCO.

More recently, he has served as a member of the Great Lakes Science Advisory Board of IJC, the Work Group on Ecosystem Health, and the Task Force on Indicators for Evaluation of Progress under the Great Lakes Water Quality Agreement. He has contributed to two recent workshops on

Indicators of Sustainable Development organized by UNEP and the Scientific Committee on Problems of the Environment (SCOPE).

Michael W. Tretheway

Faculty of Commerce and Business Administration, University of British Columbia

Michael Tretheway earned a PhD in economics from the University of Wisconsin. He is an Associate Professor of Transportation and Logistics in the Faculty of Commerce and Business Administration at the University of British Columbia. Currently he is on leave from the University, while serving as Special Advisor to the President of the Vancouver International Airport Authority.

Dr. Tretheway has specialized in the field of transportation economics and policy. He has written extensively in the area of transport including books and scholarly papers on the following topics:

- productivity analysis of rail, air, trucking and pipeline transport;
- airline globalization;
- international cost competitiveness and productivity of air carriers;
- competition policy in transport;
- the impact of deregulation on labour; and
- pricing policies for airports and airlines.

He has served as the Director of Research for the Canadian Federal Ministerial Task Force on International Air Policy, which was charged with formulating the first major change in policy since 1969. He serves as an advisor to the Minister of Transport on the transfer of federal airports to local airport authorities, and has served



as an expert witness for the Bureau of Competition Policy on transportation issues. Dr. Tretheway has also served on the Environment Canada Intervenor Funding Committee for a transport-related environmental assessment.

Dr. Tretheway teaches courses at UBC on air transportation, urban transportation, social cost-benefit analysis, and business logistics, and has been awarded the Faculty's Master Teacher Award. He has taught International Business Logistics at Université Canadienne en France, Shanghai Xiao Tung, Sian Xiao Tung and Nankai Universities. Dr. Tretheway was a visiting fellow at the Australian Bureau of Transport and Communication Economics in 1994.

Alejandro Villamar Calderón

Red Mexicana de Acción frente al Libre Comercio (RMALC)

Alejandro Villamar is responsible for Environment and Development issues, as a member of the Executive Staff of the RMALC. He participated in the elaboration of several proposals on environmental issues during the NAFTA negotiations, and is responsible for the report of the NAFTA's environmental effects in Mexico. He was RMALC's representative at the UN Earth Summit in Rio in 1992 and at the UN Summit in Copenhagen in 1995, and has attended numerous international meetings in his capacity as an NGO representative, including the Summit of the Americas, the EC, the OECD/UNCTAD, as well as participating in an NGO forum on APEC.

Dr. Villamar has been a professor and lecturer at various universities in Mexico and has conducted Titular Research at the National Institute of Fisheries. He is the author of a number of scientific

papers and books on natural resources and development. He has also held positions as the National Advisor in the United Nations Development Program (UNDP) in Mexico and has been a Parliamentary Advisor in the House of Representatives (*Cámara de Diputados*) in the Mexican Congress since 1990.

Dr. Villamar studied Biology at the National School of Biological Science, Polytechnical National Institute of Mexico, and obtained a PhD in Biology at the State University of Moscow "M. Lomonosov", former USSR. He has also completed studies in parliamentary techniques and social and political analyses at UNAM, UIA and CIDE.

Leonard Waverman

Director, Centre for International Studies, University of Toronto

Leonard Waverman is a Professor in the Department of Economics at the University of Toronto and the Director of the University's Centre for International Studies.

He received his B. Comm. and MA from the University of Toronto (1964 and 1965, respectively) and his PhD from M.I.T. in 1969. He has been a visiting scholar at the University of Essex, Stanford University, the Sloan School at M.I.T., and INSEAD. He is currently a Research Scholar in Paris at both École Supérieure des Sciences Économiques et Commerciales (ESSEC) and École Nationale de la Statistique et de l'Administration Économique-Centre de Recherche en Économie et Statistique (ENSAE-CREST).

Dr. Waverman specializes in telecommunications economics, international trade, industrial organization, and anti-trust and energy issues. He has authored numerous



scholarly works, was a member of the Ontario Energy Board and the Ontario Telephone Service Commission. He was a member of the National Association of Regulatory Utility Commissioners (NARUC).

Dr. Waverman has consulted widely in Canada, the US, Europe and Australia, as well as to international organizations — Eutelsat, the European Space Agency and the OECD. Dr. Waverman is a Principal in the Law and Economics Consulting Group, a major American-based consulting firm with offices in Berkeley, Washington, Chicago, New York and Toronto.

Since 1990, he has been the Editor of the *Energy Journal*. He has also been an Associate Editor of the *Canadian Journal of Economics* and has served on the Executive Committee of the European Association for Research in Industrial Economics. He is a member of the Canadian Law and Policy Committee of the Business and Industry Advisory Committee to the OECD and the International Chamber of Commerce.

Present research includes an extension of the 1992 book *Costs and Productivity in Automobile Production: the Challenge of Japanese Efficiency* jointly with Mel Fuss, so as to include the Mexican automotive industry; an analysis of costs and regulation in European satellite service provision (published in *Economic Policy* in October 1993); two studies for the OECD — an examination of the system of international telecommunications pricing and an examination of the linkages between telecommunications infrastructure and economic growth. Two recent books include *Talk is Cheap: the Promise of Regulatory Reform in North American Telecommunications* (with Bob Crandall, Brookings, 1996) and *The Global Recon-*

figuration of Telecommunications (American Enterprise Institute, 1996).

Sidney Weintraub

William E. Simon Chair of Political Economy, Center for Strategic and International Studies

Sidney Weintraub, an economist, holds the William E. Simon Chair of Political Economy at the Center for Strategic and International Studies. He is also Dean Rusk Professor of International Affairs at the Lyndon B. Johnson School of Public Affairs, the University of Texas at Austin, where he directs the US-Mexico Policy Studies Program.

From 1949 through 1975, Dr. Weintraub was a career State Department diplomat. He served as Assistant Administrator of the Agency for International Development, Deputy Assistant Secretary of State for Economic Affairs, Chief of the USAID Mission in Chile during the Alliance for Progress, and Chief of Commercial Policy in the State Department. He was also a senior fellow at the Brookings Institution in Washington, DC.

He is the sole author or editor of more than 15 books and 125 articles. He has written extensively about the US-Mexico-Canada trade relationship. His book *A Marriage of Convenience: Relations between Mexico and the United States* (Oxford University Press, 1990), was published in Spanish as *Matrimonio por Conveniencia* (Mexico City: Editorial Diana, 1994). Recent books include *NAFTA — What comes Next?* (Praeger for Center for Strategic and International Studies, 1994); and editor, *Integrating the Americas: Shaping Future Trade Policy* (Transaction Publishers for the North-South Center in Miami, 1994). He was the co-editor of six-volume series published by Westview Press in 1991 on Develop-



ment and International Migration in Mexico, Central America, and the Caribbean Basin. His book *Free Trade Between Mexico and the United States?* (Brookings Institution, 1984) foresaw later developments.

A few of his recent journal articles and book chapters include "The Importance of Trade in the Western Hemisphere", *Journal of Interamerican Studies and World Affairs*, Fall 1994; "Challenges for the Future of Trade in the Western Hemisphere", North-South Center, 1994; "Laying a Firm Foundation", *Foreign Service Journal*, March 1994; and "Modelling the Industrial Effects of the NAFTA", (in Lustig, Bosworth, and Lawrence, *North American Free Trade: Assessing the Impact*, Brookings, 1992). He has contributed to *Foreign Affairs*, *Foreign Policy*, *The New York Times*, *The Wall Street Journal*, *The Washington Post* and *The Financial Times*. He writes a regular opinion column for the Mexico city newspaper *El Economista* and for the Copley News Service.

Dr. Weintraub serves as a consultant to American Government agencies, private corporations, consulting firms and many international institutions, including the World Bank, the IMF, the IADB and the United Nations. He has participated in meetings of the GATT, the OECD and many United Nation agencies.

Dr. Weintraub was educated at the American University (PhD Economics), Yale University (MA Economics), the University of Missouri (BJ and MA in Journalism), Boston University (German language program), and City College, New York (BBA).

Douglas P. Wheeler

Secretary for Resources, The Resources Agency, California

The Resources Agency

Created in 1961, the Resources Agency oversees and coordinates the activities and functions of 17 state departments, boards, commission and conservancies, including the departments of Conservation, Fish and Game; Forestry and Fire Protection; Parks and Recreation; and Water Resources, as well as the California Coastal Commission. The departments, boards and commissions have a combined workforce of 12,000 and an annual budget of approximately US \$1.5 billion. They range in size from the Department of Forestry and Fire Protection, which employs 4,600 and has a budget of approximately US \$400 million, to the Colorado River Board of California with ten employees and a budget of US \$900,000.

The Secretary for Resources, a member of the Governor's Cabinet, is responsible for California's activities relating to the management, preservation, and enhancement of its natural resources, including land, wildlife, water and minerals. In addition, the Secretary is responsible for oversight of the state's scenic, cultural, and recreational resources. The Secretary also serves as the Governor's representative on the Agency's boards and commissions, coordinates state and federal resource programs, supervises departmental fiscal affairs, and oversees the preparation of environmental impact reports.



Douglas P. Wheeler

Douglas P. Wheeler was named California's seventh Secretary for Resources on December 26, 1990, and he was sworn into office on January 7, 1991.

A long-time leader in the field of conservation, Wheeler served as Vice President of the WWF and the Conservation Foundation in 1990, having served as Executive Vice President and Vice President of the Conservation Foundation from 1987 to 1990. Previously, Wheeler served as Executive Director of the Sierra Club (1985-1987); Founder and President of the American Farmland Trust (1980-1985); Executive Vice President of the National Trust for Historic Preservation (1977-1980); Deputy Assistant Secretary of the Interior (1972-1977); and Legislative Counsel and Legislative Attorney for the Department of the Interior (1969-1971).

Wheeler is a graduate of Hamilton College (1963) and Duke University School of Law (1966). A Republican, Wheeler is married and has two sons.

David Wilk Graber

Director General, WG Consultores y Asociados, S.A. de C.V.

David Wilk holds a PhD in Environmental Planning from the University of California, Berkeley. His doctoral dissertation was on Assessing Land Use and Environmental Policy Processes in the Urban Fringe of Mexico City. He has published works on land use and environmental conservation, planning, and policy processes; as well as on the subject of impact regulations and assessments and geographic information systems (GISs) as applied to land use and environmental analysis.

He is the founder and General Director of *WG Consultores y Asociados, S.A. de C.V.*, an urban environmental consulting firm established in Mexico in 1994. *WG Consultores y Asociados, S.A. de C.V.* is a member of the *Cámara Nacional de Empresas de Consultoría* and is registered by the *INE* as a firm specialized in Environmental Impacts on Federal Tourist Developments and Means of Transportation.

Dr. Wilk was part of a working group (1994 to 1995) on sustainable development, trade, natural resources, trade and technology of the OECD, where he was responsible for the section on Energy, Trade and Environment in Mexico. Dr. Wilk also headed the environmental management component of the World Bank's Northern Border Environmental Project (US-Mexican border) and has been in charge of numerous international consulting assignments related to environment and transport, most recently the Buenos Aires-Colonia Crossing Project (Argentina and Uruguay), the reconstruction of two bridges destroyed during the war in El Salvador, and IDB-sponsored transport projects in Nicaragua and El Salvador.

Before founding *WG Consultores y Asociados, S.A. de C.V.*, Dr. Wilk worked as an independent consultant for five years developing numerous projects in the areas of land use and environmental planning, environmental impact assessment and GISs.

Dr. Wilk is a member of the *Sociedad Mexicana de Planificación, México*, the Executive Board of Partners of the Americas, San Francisco Bay Area-Mexico City Partnership. He was the Chairman of the Urban Ecology Committee (active until December



1987), and a member of the Binational Committee on the Use of Mexico City Aquifer as a Water Supply Resource, as well as the National Research Council

(Water Science and Technology Board, US) and the *Academia Nacional de Ingeniería* (Mexico).



Appendix F: NAFTA Effects Advisory Group

Pierre-Marc Johnson (Chair)
Heenan Blaikie, Montreal

León Bendesky
Economist, Mexico

Pierre Goselin
Comité de santé environnementale du
Québec

William Haney III
President, Molten Metals Technologies

Kenneth Harrigan
Past Chair and CEO, Ford Motor
Company of Canada

Gary Hufbauer
Institute for International Economics

Richard Kamp
Director, Border Ecology Project

Elizabeth May
Executive Director, Sierra Club of
Canada

Jack McLeod
Corporate Director, Shell Canada
(former CEO)

José Montemayor
President, Chemical Producers
Association

Robert Repetto
Vice President and Chief Economist,
World Resources Institute

Hilda Salazar
President, *Grupo Desarrollo-Ambiente*

Philip Shabecoff
Editor, Greenwire

Víctor Toledo
Centro de Ecología, UNAM

Víctor Urquidi
El Colegio de México

