Environmental Risks Related to the Maquiladora Industry and the Likely Environmental Impact of NAFTA

Santos Gomez†

I.
INTRODUCTION: MAQUILADORAS AND NAFTA

Rapid growth of the “maquiladora” industry¹ and the prospect of a North American Free Trade Agreement² (NAFTA) has focused public attention on the relationship between the environment and trade.³ In November 1990, President Salinas of Mexico and President Bush of the United States discussed, among other things, environmental concerns regarding the border region.⁴ That meeting resulted in a commitment for

† Santos Gomez is a third-year law student at the University of California, Davis. Mr. Gomez received his B.A. from Pomona College in 1988.

1. Over the past five years, the maquiladora industry has sustained an annual growth of 15% to 20%. See Michael Satchell, Poisoning the Border, U.S. NEWS AND WORLD REPORT, May 6, 1991, at 32. The term “maquiladora” stems from the Spanish word “maquila,” which refers to the toll of grain or flour paid to the miller or lord of a manor for the grinding of grain. SIMON & SCHUSTER’S INTERNATIONAL DICTIONARY: ENGLISH/SPANISH 1337 (1973). Today, the term “maquila” refers to the labor and services provided by Mexican laborers employed by the maquiladoras. “Maquiladora” is the generic term for foreign-owned plants in Mexico along the Mexican-United States border. See Elizabeth C. Rose, Transboundary Harm: Hazardous Waste Management Problems and Mexico’s Maquiladoras, 23 INT’L LAW. 223, 223 n.1 (1989).

2. President Clinton has endorsed NAFTA but has called for side agreements in the areas of labor, environment and import surges. He has announced that he will address these residual concerns, including the creation of a North American Commission on Environment (NACE), through supplemental agreements with Canada and Mexico. See 10 INT’L TRADE REP. (BNA) 15 (March 10, 1993). The trinational environment commission should ensure that Mexico, Canada and the United States enforce their own laws. Parallel discussions are already on their way. These supplemental agreements, together with NAFTA’s text and NAFTA’s implementing legislation, constitute what some refer to as the “NAFTA Package.” See STEWART J. HUDSON AND RODRIGO J. PRUDENCIO, THE NORTH AMERICAN COMMISSION ON ENVIRONMENT AND OTHER SUPPLEMENTAL ENVIRONMENTAL AGREEMENTS: PART TWO OF THE NAFTA PACKAGE I (1993).


4. See ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL PLAN FOR THE MEXICO-UNITED STATES BORDER AREA 2 (1992) [hereinafter BORDER PLAN]. President Salinas and President Bush met in Monterrey, Nuevo Leon, Mexico, to discuss a variety of issues including
greater cooperation between the United States Environmental Protection Agency (EPA) and Mexico's Secretaria de Desarrollo Urbano y Ecologia (SEDUE). This commitment focused on current environmental problems in the border area.

Environmental concerns have raised tensions on both sides of the border. Indeed, concerns regarding maquiladora hazardous waste management practices, may ultimately determine the fate of NAFTA. Environmentalists on both sides of the border accuse United States companies of relocating in Mexico to avoid stricter United States environmental regulations. The United States and Mexican governments are aware of such criticism and the media scrutiny surrounding maquiladora environmental issues. Consequently, SEDUE has doubled its agents in the border area and has increased its enforcement efforts to help ensure that NAFTA and the environment.

NAFTA and the environment. *Id.* Both Presidents realize that NAFTA could have significant environmental consequences. *Id.* Growing population and industrialization along the Mexican-United States border are already posing environmental challenges that need to be addressed whether or not NAFTA is approved. Economic benefits of NAFTA offer both nations perhaps their best hope for gathering economic resources to protect the environment. John Wise, Remarks to the American Bar Association on Environmental Concerns Relative to the NAFTA (undated) (transcript available at EPA Region 9).

5. The English translation is “Ministry of Urban and Ecological Development.” On May 26, 1992, Mexico announced that it was establishing a new agency, the Secretariat of Social Development (SEDESOL). SEDESOL will perform all environmental functions previously performed by SEDUE, plus additional functions such as channeling funds into social welfare and infrastructure projects under the Solidarity Program. See United States General Accounting Office, U.S.-Mexico Trade: Assessment of Mexico’s Environmental Controls for New Companies 2 (August 1992). SEDUE is used throughout this paper to refer to Mexico’s environmental agency without distinguishing between the old SEDUE or the new SEDESOL.

6. See Border Plan, supra note 4, at 3. The Border Environmental Plan calls for greater cooperation between the two nations on environmental issues. *Id.* Under the plan, Mexico will target the most serious existing problems. To begin to address environmental concerns, especially in the border area, Mexico has committed $149 million for 1992 and $460 million for the next three years. *Id.* Similarly, the United States, under EPA, committed $179 million for border area environmental projects for FY 1993. *Id.* The United States plans to continue its fiscal commitment beyond 1992 but the amount has not yet been designated.


8. See Rose Gutfeld, Keeping It Green, WALL ST. J., Sept. 24, 1992, at R8 (noting some furniture makers have moved to Mexico to escape tough air-pollution regulations in California); Bob Davis, Heading South, WALL ST. J., Sept. 24, 1992, at R1 (noting that environmentalists claim that loose Mexican enforcement of environmental laws will lure United States companies south and that they will undermine environmental standards at home). But cf. Malissa McKeith, Analysis and Perspective: Environmental Provisions Affecting Business on the U.S./Mexico Border, 15 Int’l Env’tl. Rep. 245 (1992) (noting that reliable empirical data is not available to support this accusation).

In a recent poll by the Roper Organization, 81% of companies surveyed endorsed NAFTA and 40% plan to shift some production to Mexico. See George Anders, Heading South, WALL ST. J., Sept. 24, 1992, at R1. Companies, by a margin of three-to-two, would support an even wider regional trade agreement that would cover all of Latin America. *Id.* Companies, however, were not polled on whether environmental considerations influenced their decisions to shift some production to Mexico.
border area maquiladoras comply with environmental regulations. However, critics such as the Sierra Club, argue that the recent crackdown is symbolic, i.e., mainly a political maneuver designed to create a "get-tough" public relations image to win support for NAFTA. They view increased enforcement as a step in the right direction but fear that once NAFTA is approved, Mexico will again sacrifice the environment for economic growth.

Although environmental concerns are overstated, they are not entirely unfounded. Enrique Medina, an industry consultant who has trained SEDUE inspectors, stated that enforcement efforts are hampered by inaccurate information. Robert Jones, the former chief engineer of the Texas Water Commission and now a private consultant, remarked that most maquiladoras are discharging raw waste into primary water streams in the border area. Indeed, the General Accounting Office (GAO) released a report in August of 1992 highlighting SEDUE's lax enforcement.

The GAO audited six new United States majority-owned maquiladoras and found none had complied with applicable environmental laws. Another GAO report has confirmed that maquiladoras contributed significantly to border area pollution. The GAO report is substantiated by scholars such as Barbara Scramstad and Roberto A. Sanchez who conclude that maquiladoras are major generators of both hazardous waste and border pollution. The GAO also noted that both the United States and Mexican governments are concerned that maquiladoras are

10. See INT'L TRADE REP., supra note 2, at 1770 (noting that future funding to clean up the border is too uncertain); McDonnell, Foreign-Owned Companies Add to Mexico's Pollution, L.A. TIMES, November 18, 1991, at Metro 1; Gutfeld, supra note 8, at R8.
11. See infra notes 110-112 and accompanying text.
12. See Solis, supra note 9, at R17. He estimates that 90% of the company-generated information SEDUE has on its files is inaccurate.
13. See GAO, supra note 5, at 3.
14. See GAO, supra note 5, at 3.
15. Id. (noting that none had prepared environmental impact assessments (EIA) or obtained a letter from SEDUE stating that an EIA was not required).
17. See Barbara Scramstad, Transboundary Movement of Hazardous Waste from the United States to Mexico, 4 TRANSNAT'L LAW. 253, 258 (1991) (noting that the United States, Mexico and non-governmental organizations have identified United States-owned maquiladoras as major generators of hazardous waste but that virtually no records of use and disposal of hazardous waste exist); Roberto A. Sanchez, Health and Environmental Risks of the Maquiladora in Mexicali, 30 NAT. RES. J. 166, 184 (1990) (noting that hypothesis that maquiladoras generate significant amounts of hazardous waste is supported by empirical data on use of hazardous materials and on lack of evidence that hazardous waste is exported back to the country of origin).
not properly disposing of their hazardous waste.\textsuperscript{18}

Even SEDUE officials acknowledge lack of maquiladora compliance with Mexico's environmental laws.\textsuperscript{19} In one case, SEDUE allowed four of six maquiladoras to operate before obtaining the legally required operating permits.\textsuperscript{20} SEDUE admits that its efforts to assess hazardous waste emissions and disposal problems are hampered by the maquiladoras' reluctance to cooperate and their unwillingness to provide complete and accurate information.\textsuperscript{21}

This paper assesses environmental risks related to maquiladora hazardous waste emissions and the likely environmental impact of NAFTA on the border area.\textsuperscript{22} It presents an overview of the border area and the maquiladora industry.\textsuperscript{23} Third, it provides a brief summary of the political impetus for NAFTA.\textsuperscript{24} Fourth, it sets forth an overview of the internationalization of environmental issues.\textsuperscript{25} Fifth, it analyzes the environmental laws regulating hazardous waste produced by the maquiladoras and Mexico's environmental enforcement practices.\textsuperscript{26} Sixth, it presents an overview of Mexico's environmental law enforcement practices.\textsuperscript{27} Seventh, it examines the likely environmental impact NAFTA will have on the border region.\textsuperscript{28} Finally, this paper concludes that although NAFTA does not contain many enforceable environmental provisions, it will generate the resources necessary for Mexico to minimize the degradation of its environment.\textsuperscript{29}

\begin{itemize}
\item \textsuperscript{18} See GAO, supra note 5, at 3.
\item \textsuperscript{19} Id.
\item \textsuperscript{20} See Sanchez, supra note 17, at 163. Sanchez notes that addressing the reluctance of the maquiladoras to provide emissions information, given the tremendous growth of the industry over the last five years, is critical to developing an appropriate solution. Id. Other scholars agree and regard lack of accurate information as one of the major obstacles to assessing the severity of the problem. See Patrick McDonnell, \textit{Border Boom Feeding Hazardous Waste Ills}, L.A. TIMES, September 10, 1989, at Metro 1. Mexico and the United States cannot rely on voluntary cooperation from maquiladoras. Plans to address the problem of maquiladora hazardous waste must address the lack of accurate information. Further, SEDUE should, as its first priority, devise plans to enforce existing regulation, especially since it estimates that 50\% of the 2,000 maquiladoras generate hazardous waste. See McKeith, supra note 8, at 246. Only 30\% of all maquiladoras that generate hazardous waste have acquired the necessary operating licenses. Id. Further, only 19\% reported returning hazardous waste to the country of origin, as required by both Mexican and United States law. Id. SEDUE and others note that due to lack of sound information and delays in reviewing and approving license applications, statistics may not be accurate. Id.; see also notes 13 & 14 and accompanying text (noting that out of six maquiladoras audited none complied with Mexico's regulations).
\item \textsuperscript{21} See infra notes 112-148 and accompanying text.
\item \textsuperscript{22} See infra notes 30-49 and accompanying text.
\item \textsuperscript{23} See infra notes 50-61 and accompanying text.
\item \textsuperscript{24} See infra notes 62-73 and accompanying text.
\item \textsuperscript{25} See infra notes 74-149 and accompanying text.
\item \textsuperscript{26} See infra notes 150-203 and accompanying text.
\item \textsuperscript{27} See infra notes 204-235 and accompanying text.
\item \textsuperscript{28} See infra notes 131, 132, 141, 149 and accompanying text.
\end{itemize}
II.
The Border Area and the Maquiladora Industry: An Overview

A two-thousand mile border separates the United States and Mexico; two nations with different economic, political, social, cultural and legal systems. The United States has a highly legalistic tradition of environmental law that now governs the behavior of most United States industries. Environmental law in the United States is based on the statutory prescriptions of regulation and enforcement known as command and control, and this system is supported by an extensive body of case law. Mexico's civil legal system is essentially all statutory. In Mexico there is essentially no judge made law. Although Mexican courts do not make law, attorneys recognize that a court is likely to decide similar cases the same way and, therefore, do informally keep up on what the courts are doing.

In Mexico, local governments lack autonomy to make major policy decisions and implement local programs. Local governments are preempted from enacting or enforcing hazardous waste regulation. Local governments must rely on the state and federal governments to enact and implement regulation. By contrast, local governments in the United States frequently possess independent authority or are delegated authority to enact and administer environmental regulation.

Economic differences between the United States and Mexico make the development of a joint comprehensive environmental border area policy difficult. United States prosperity greatly influences American culture and the expectations of the American public for environmental quality. It is important, therefore, that the United States does not superimpose its environmental values and standards on Mexico. The Clinton administration must be sensitive to Mexico's sovereignty, and its laws, values and traditions.

30. See Border Plan, supra note 4, at 6. For the purpose of this paper, the economic and legal differences will only be highlighted. However, that is not to say that political, social and cultural differences are not important factors in developing a comprehensive joint environmental border area policy.
31. See Wise, supra note 4, at 3.
32. See James E. Herget and Jorge Camil, An Introduction to the Mexican Legal System 33 (1978).
33. Id. at 77.
34. Id.
36. Id.
38. See Wise, supra note 4, at 3.
39. Id.; see also Eugene H. Douglas, Remarks Before the Conference: Mexico and the United
At the border these differences between the United States and Mexico are often blurred. Soloman Ortiz, chairman of the Congressional Hispanic Caucus and representative of a district bordering Mexico, has noted a high degree of economic, cultural and social interchange between both nations. Border residents know that industrialization on either side of the border can adversely affect the environment, thereby affecting their quality of life. Thus, from an environmental perspective, the border is undivided and to protect the border environment and the inhabitants' quality of life, an integrated and coordinated approach is required.

Historically, mining and agriculture dominated the border area. Since 1966, however, the border area has undergone a transformation into an industry based economy. In 1966, the Mexican government initiated a border industrialization program to combat severe unemployment in the northern region of Mexico. In 1991, Mexico housed over 2,000 maquiladora plants, employing over half a million Mexican workers. The growth of the maquiladora industry is mostly attributable to the favorable policy towards the maquiladoras, such as low tariffs and other government incentives.

Article V of Mexico's Foreign Investment Law authorizes the National Commission on Foreign Investment to exempt maquiladoras from States, 18 CAL. WEST. INT'L L.J. 5, 11 (1987-1988) (arguing that United States has fundamental interest in ensuring Mexico's economic development and its political stability because Mexico's economic well-being and its political stability influence United States economic prosperity and security).

40. Id., at 11 (noting that interaction between Mexican and American border residents is extensive and growing); BORDER PLAN, supra note 4, at 6. Many border residents speak both English and Spanish and many of them cross the border each day to commute to their jobs. Id.

41. See Panel Discussion by the Congressional Hispanic Caucus, FED. NEWS SERV. (Federal Information Systems Corporation), September 15, 1992.

42. See BORDER PLAN, supra note 4, at 7; see also Weston, supra note 30, at 117 (noting that environmental border area problems includes water, air, soil and solid waste). Weston notes that environmental pollution knows no boundaries. He encourages Mexico and the United States to jointly address border issues in order to adequately protect the border environment.

43. See BORDER PLAN, supra note 4, at 8; see also, STANLEY R. ROSS, VIEWS ACROSS THE BORDER 141-51 (1978) (discussing early border economy); DONALD W. BAERRESEN, THE BORDER INDUSTRIALIZATION PROGRAM OF MEXICO 2-3 (1971) (noting that employment opportunities were limited to agriculture).

44. See, e.g., McDonnell, supra note 21, at 1 (noting that maquiladoras in Tijuana have increased from 140 in 1983 to 450 in 1989).

45. The Maquiladora Program grew out of Mexico's need to provide employment for thousands of displaced braceros in the northern region of Mexico. See Zack V. Chayet and Eduardo A. Bustamante, The Mexican Maquiladora Industry: Legal Framework of the 1990's, 20 CAL. W. INT'L L.J. 263 (1990). During World War II, Mexican laborers were admitted into the United States to help fill a need for farm workers created by the war. Entry into the United States was formally sanctioned in 1951 with the creation of the bracero program. The program was terminated in 1964 under pressure from organized labor. In 1964, 185,000 Mexicans were employed as braceros in the United States. The termination of the bracero program greatly aggravated the already high unemployment in border cities.


47. See infra notes 46-53 and accompanying text.
local ownership requirements. In 1973, the Commission exempted maquiladoras from the fifty-one percent local ownership requirement to allow 100% foreign ownership. Further, the Decree for the Development and Operation of the In-Bond Export Industry permits maquiladoras to import capital equipment, components, and raw materials into Mexico duty free. Materials and equipment imported by maquiladoras for manufacturing or assembling are exempt from custom duties. They are generally exempt from custom duties on the theory that they are admitted under bond, i.e., lien. Hence the term “in-bond” and maquiladora industry are used interchangeably.

Equipment and materials necessary to conduct the manufacturing or assembly remain in Mexico duty-free for as long as the maquiladora operates. Raw materials and materials used in the production process may remain in Mexico duty-free for six months from the date of entry. If materials are not used within the six months, a single extension is available.

The raw materials are then assembled in maquiladora plants. Finally, when the finished product is exported to foreign markets, duty is paid only on the value added in Mexico. Generally speaking, the value added is the cost or value of the repairs, processing, assembling, manufacturing and/or alterations made in Mexico.

The Mexican government views the border industrialization program as a great success and an integral part of Mexico's overall economic well-being. Maquiladoras generate an estimated three billion dollars in

---

51. See Gritsch, supra note 49, at 358, 373.
53. Id.
54. Id.
55. See Folson, supra note 48, at 345.
56. See Reginald L. Davis, Legal Regime of Mexico's In-Bond Industry: Towards Integration, reprinted in * Gordon, Doing Business in Mexico (1988), at 33B-25. Determining value added can be extremely complicated and is beyond the scope of this paper.
57. See Sanchez, supra note 17, at 163-64 (noting that a large group of Mexico's public officials consider maquiladoras vital to the well-being of the national economy).
foreign exchange earnings, second only to Mexico's petroleum industry. They account for virtually all manufacturing jobs created in the 1980s and a fifth of Mexico's overall manufacturing base. In a sense, the border industrialization program is the forerunner to NAFTA. It succeeded in showing Mexico what less restrictive trade can accomplish.

III.
NAFTA: POLITICAL IMPETUS

On May 24, 1991, Congress extended for two years President Bush's "fast track" authority to negotiate a NAFTA with Mexico and Canada. "Fast track" authority is the shorthand description of procedures which permit the executive to negotiate a trade agreement with foreign nations. "Fast track" involves a two step process. First, Congress must delegate to the executive the authority to negotiate the agreement. Second, once the executive negotiates the agreement, Congress votes to approve or disapprove the agreement. That is, Congress may not modify the agreement under "fast track."

On August 12, 1992, after a year of negotiations, President Bush announced that the United States, Mexico and Canada had completed negotiations on NAFTA. On December 17, 1992, President Bush, President Salinas and Canadian Prime Minister Mulroney signed the agreement. The signing of NAFTA by President Bush means that it will be considered under "fast track" procedures regardless of when the implementing legislation is submitted to the Congress for approval. For NAFTA to take effect, it must be approved by the legislatures of all three countries. Once the implementing legislation is submitted in the United States, Congress will have ninety legislative days to approve the agreement with no amendments.

The Mexican and Canadian legislatures are expected to approve NAFTA. The outcome in the United States, given the change in admin-

59. Id.
60. Id. at 47-48.
62. See, 137 CONG. REC. 3589 (daily ed. May 23, 1991) (disapproving H. RES. 101 that would have denied President fast track authority); 137 CONG. REC. S6829 (daily ed. May 24, 1991) (rejecting S. RES. 78 that would have denied President fast track authority).
63. See 9 INT'L TRADE REP. (BNA) 1375 (August 12, 1992).
64. INT'L TRADE REP. (BNA) (Dec. 23, 1992).
65. Id.
66. See INT'L TRADE REP., supra note 63, at 1375.
67. See INT'L TRADE REP., supra note 64.
istration and the current makeup of the Congress, is much less certain. On August 6, 1992, the House unanimously passed a resolution that would oppose any trade agreement that jeopardizes United States environmental standards. President Clinton has endorsed NAFTA as negotiated but has called for supplemental agreements to address labor and environmental issues. President Clinton met with President Salinas in January 1993, to discuss the NAFTA. Dispite his desire to see NAFTA enter into effect on January 1, 1994, President Clinton will not sacrifice substance for speed in negotiating the supplemental agreements to address labor and environmental concerns.

The Clinton Administration is well aware that the NAFTA text, as it stands today, contains no provisions to compel a country to enforce its domestic environmental laws. While some non-governmental organizations continue to advocate renegotiation of the NAFTA text, the focus of the Clinton Administration has shifted to negotiating supplemental agreements to address the environmental concerns, including the creation of a North American Commission on Environment (NACE). The Administration needs to workout an adequate arrangement for enforcing NAFTA environmental provisions without sacrificing principles of national sovereignty. Failure to negotiate comprehensive agreements on the environment may lead to the defeat of NAFTA by the United States Congress. These supplemental environmental agreements will form an integral part of [the] NAFTA package that Congress expects as a condition of its support for NAFTA. President Clinton will not press for United States ratification of NAFTA unless comprehensive supplemental agreements dealing with the environment are completed.

IV. INTERNATIONALIZATION OF ENVIRONMENTAL ISSUES

Policy makers worldwide have begun to focus on the relationship between trade and environment. Environmental issues can become internationalized in at least three ways. Transborder spill-over of pollution

68. See INT'L TRADE REP., supra note 63, at 1387.
69. Id. at 1920.
70. Id. at 2162.
71. See INT'L TRADE REP., supra note 2, at 17 (March 17, 1993).
72. See HUDSON & PRUDENCIO, supra note 2, at 1.
73. Id. The NAFTA package consists of the NAFTA text, the NAFTA implementing legislation and the NAFTA supplemental environmental agreements, including NACE. Id. The NAFTA package, rather than the NAFTA text itself, will determine whether the United States Congress approves or rejects NAFTA.
into another country is the first.\textsuperscript{75} The other two, which occur even when the issues are purely domestic, are through concerns over the impact of environmental policies on international competitiveness and through the assertion of jurisdiction over other nations' environmental priorities and practices.\textsuperscript{76} Because of this, policy makers are making efforts to incorporate environmental issues into trade policy. Policy makers realize that unilateral action is not the most efficient instrument for dealing with environmental problems.\textsuperscript{77} A policy of cooperation among trading partners to protect the environment is superior to unilateral action because it can produce significant incentives to encourage environmentally sound production and manufacturing practices.

In reaction to international concerns surrounding transboundary movements and hazardous waste management practices in less developed countries, policy makers world wide adopted the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal.\textsuperscript{78} The world community has recognized the need to protect human health and safety by addressing environmental issues on a world wide basis. This commitment was reflected by the Earth Summit held in Rio de Janeiro in June, 1992. Issues on the Summit's agenda included biological diversity, hazardous waste disposal and many others.\textsuperscript{79}

President Bush, however, refused to embrace specific goals and time tables for capping emissions of carbon dioxide, methane and other greenhouse gases by the year 2000.\textsuperscript{80} Some European Nations were prepared to provide monetary assistance to developing nations to help them comply with more stringent greenhouse gasses requirements.\textsuperscript{81} They were urging the United States to do the same.

The international trade community is aware of the changing international environmental climate.\textsuperscript{82} Multinational corporations, especially, are aware that most environmentalists hold them responsible for the negative environmental impacts of free trade. This perception is not unfounded since for many years the international trade community viewed environmental concerns as unrelated to trade. It viewed the envi-

\textsuperscript{75} See \textit{General Agreement on Tariffs and Trade, International Trade} 90-91, at 34-36 (1992).
\textsuperscript{76} Id. at 27-36.
\textsuperscript{77} Id. at 21.
\textsuperscript{81} See Lewis, supra note 81.
vironmental concerns merely as a convenient cover for economic protectionism and not as a legitimate trade issue.

Because environmental groups have focussed attention on the environmental impact of trade agreements, the international trade community is slowly changing its views. The National Wildlife Federation (NWF) was instrumental in demonstrating that if properly formulated, negotiated and implemented, trade can work in favor of, and not against, sustainable development. As early as 1991, the NWF was addressing the need for environmental concerns to be part of the negotiations for the NAFTA. Currently, the NWF's position is that the NAFTA text need not be renegotiated. However, it supports additional supplemental environmental agreements, including the creation of NACE, to ensure that an effective funding mechanism for environmental infrastructure projects related to increased trade and enhanced enforcement and regulatory capacity are part of NAFTA.

The NWF did not simply focus on the negative environmental impacts of NAFTA. Rather, it worked with the negotiators and the Bush Administration to improve, not upend NAFTA. The international trade community must similarly demonstrate flexibility to incorporate environmental issues into any free trade discussion. Cooperation between environmental groups and trade advocates is vital to long-term sustainable development that promotes both trade and environmental protection.

V. ENVIRONMENTAL LAWS REGULATING HAZARDOUS WASTE PRODUCED BY MAQUILADORAS

In addition to showing Mexico the benefits of free international trade, the maquiladora industrialization program focused attention on the effects of trade on the environment. Specifically, the industrialization program focused attention on Mexico's environmental laws that regulate hazardous waste produced by Maquiladoras and on its environmental enforcement practices.

A. The La Paz Agreement

Although Mexico and the United States have a long history of environmental cooperation, not until 1983 did they make a serious effort to

83. See Jay D. Hair, Presentation to the U.S. Chamber of Commerce (December 5, 1992), reprinted in NATIONAL WILDLIFE FEDERATION, TRADE AND THE ENVIRONMENT (Information Packet January 1, 1993). The NWF criticized the international trade community for claiming that environmental concerns were unrelated to trade. Conversely, the NWF criticized many in the environmental community for portraying that the current trend toward more liberalized trade was designed specifically to undermine environmental protection. Id.
84. Id.
85. Id.
resolve the border environmental problems. In 1983, in response to continued growth and industrialization, the United States and Mexico signed the "LA PAZ AGREEMENT." The objective of the LA PAZ AGREEMENT was to address environmental problems created by the growth of the border area economy and population. It calls for the protection of the environment by "coordination of national programs; scientific and educational exchanges; environmental monitoring; environmental impact assessment; and periodic exchange of information and data on likely sources of pollution . . . ."

The LA PAZ AGREEMENT, however, lacked provisions regulating hazardous waste or an enforcement mechanism. While the AGREEMENT lacked enforceable environmental regulations, it outlined procedures for adopting technical specifications, or "annexes," to correct specific border environmental problems. Of the four annexes adopted since 1984, Annexes II and III deal with issues concerning transboundary shipments of hazardous wastes in the border region.

1. Annex II to the "LA PAZ AGREEMENT"

Annex II set forth provisions to establish the "United States-Mexico Joint Contingency Plan" to respond to discharges, or the threat of discharges, of any hazardous substance on the border area which causes, or threatens to cause, imminent and substantial adverse effects on the public health, welfare or the environment. Each country committed itself to the development of response plans designed to detect the existence or the


87. LA PAZ AGREEMENT, at art. I; see also Joseph Nalven, Transboundary Environmental Problem Solving: Social Process, Cultural Perception, 26 NAT. RES. J. 793, 793 (1986) (noting that the purpose of agreement was to alleviate environmental problems occurring in the border area).

88. LA PAZ AGREEMENT, at art. VI.

89. Id. at art. III. Procedures for adopting technical specifications are extremely vague. The LA PAZ AGREEMENT only states "the Parties may conclude specific arrangements for the solution of common problems in the border area" and "the parties may also agree upon annexes to this agreement on technical matters." Id.


imminent possibility of the occurrence of pollution incidents within their jurisdictions. In addition to providing adequate response measures to minimize any adverse effects on the environment and the public health and welfare, Annex II called for the exchange of up-to-date information.

2. **Annex III to the "La Paz Agreement"**

Annex III seeks to prevent public health and environmental damage by establishing notification procedures for transboundary shipments of hazardous waste and substances. It defines hazardous waste as any waste designated or defined by either EPA or SEDUE, pursuant to national policies, laws or regulations, which if improperly managed may result in health or environmental damage. Similarly, it defines hazardous substances as pesticides or chemicals, which may produce harmful effects to public health or the environment.

Annex III regulates the activities associated with hazardous waste and substances including handling, transportation, treatment, recycling, storage and disposal. It declares that the parties “shall ensure that their domestic laws and regulations are enforced to the maximum extent practicable.” It also provides that the parties will monitor and spot-check transboundary movements of hazardous waste and substances to enforce compliance with the domestic laws of each country and the notification requirements.

The notification provisions of Annex III require the designated authority of the exporting country to notify the importing country’s designated authority of the proposed hazardous shipment. The notification must identify the exporter, the type and quantity of the waste being exported, the period over which the waste will be exported and the port of entry into the receiving country. The importing country’s designated authority must then respond to the notification by consenting or objecting to the export. If the importing country decides to return a hazardous waste shipment, for any reason, the exporting country must

---

93. See Annex II, art. IV, at 20.
94. See Annex III, supra note 78, at art. III.
95. Id. at art. I, ¶ 2. Annex III also addresses the transboundary movement of hazardous substances. Id. at art. II, ¶ 1.
96. Id. at art. I, ¶ 3 (paralleling the requirements embodied in the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-92k (1988)).
97. Id. at art. I, ¶ 4.
98. Id. at art. II, ¶ 2.
99. Id. at art. II, ¶ 3.
100. Id. at art. III, ¶ 2 (requiring notice at least 45 days in advance).
101. Id.
102. Id. at art. III, ¶¶ 4, 5 (stating that the importing country has 45 days in which to respond to the notification and the right to modify the terms of the planned shipment before consenting).
1993] ENVIRONMENTAL RISKS RELATED TO MAQUILADORAS  187

readmit it.\textsuperscript{103} Also, hazardous waste produced from raw materials admitted "in-bond" by the maquiladoras is required to be returned to the country of origin.\textsuperscript{104}

B. The Hazardous Waste Regulatory Framework under the General Law on Ecological Equilibrium and Environmental Protection

While Annex III provides general import/export guidelines, Mexico's domestic laws or regulations set the standards for environmental protection.\textsuperscript{105} On January 28, 1988, Mexico enacted the Ley General del Equilibrio Ecológico y Protección al Ambiente (the General Law),\textsuperscript{106} a comprehensive and detailed environmental law, to reinforce and supplement Annex III requirements. The General Law regulates air,\textsuperscript{107} water,\textsuperscript{108} soil,\textsuperscript{109} and hazardous waste and substances.\textsuperscript{110} On November 25, 1988, the Regulations for the General Law on Ecological Equilibrium and Environmental Protection on the Subject of Hazardous Waste were enacted to deal specifically with the management of hazardous waste and substances.\textsuperscript{111}

I. Scope of the Hazardous Waste Regulations

Mexico's Hazardous Waste Regulations delineate the particular responsibilities of the industries that generate, transport and/or operate a treatment, storage or disposal (TSD) facility.\textsuperscript{112} SEDUE is authorized to enforce the hazardous waste provisions\textsuperscript{113} and to determine and publish in the "DIARIO OFICIAL" the listings of hazardous wastes and substances.\textsuperscript{114} SEDUE enforces this law through a series of "normas técnicas ecologicas" (ecological technical standards or NTEs)\textsuperscript{115} dealing with: criteria or hazardous waste characterization and listing;\textsuperscript{116} extraction

\textsuperscript{103} Id. at art. IV.
\textsuperscript{104} Id. at art. XI (defining "in-bond" materials as materials admitted for manufacturing and processing under the maquiladora program).
\textsuperscript{105} See generally Annex III, supra note 90.
\textsuperscript{106} See DIARIO OFICIAL, January 28, 1988 (translates to "General Law of Ecological Equilibrium and Environmental Protection" [General Law]. The General Law authorizes SEDUE to enact and enforce environmental regulations.
\textsuperscript{107} Id. at art. CX-CXVI.
\textsuperscript{108} Id. at art. CXVII-CXXXIII.
\textsuperscript{109} Id. at art. CXXXIV-CXLIV.
\textsuperscript{110} Id. at art. CL-CLIII.
\textsuperscript{111} See DIARIO OFICIAL, November 25, 1988 (hereinafter Hazardous Waste Regulations).
\textsuperscript{112} Id.
\textsuperscript{113} Id. at art. I.
\textsuperscript{114} Id. at art. IV.
\textsuperscript{115} See MARIA DEL CARMEN CARMONA LARA, DERECHO ECOLOGICO 57, (1991) (explaining that NTEs are administrative rulings by SEDUE which define the technical parameters within which industry must execute projects which cause or might cause ecological disequilibrium.
\textsuperscript{116} NTE-CPR-001/88, DIARIO OFICIAL, June 6, 1988.
tests to determine hazardous waste toxicity;\textsuperscript{117} procedures to evaluate incompatibility of hazardous waste;\textsuperscript{118} and, hazardous waste storage facility requirements, facility design and construction, and operation of hazardous waste storage facilities.\textsuperscript{119}

Responsibility for compliance with provisions of the General Law and with the NTEs falls on the generator of hazardous waste and the TSD facilities that handle, import or export hazardous waste.\textsuperscript{120} Those intending to undertake public or private works or activities through which hazardous waste may be generated or handled must have the authorization of SEDUE.\textsuperscript{121} Further, they must perform an environmental impact assessment (EIA) for all public or private works to assess the hazardous waste that they will produce or handle.\textsuperscript{122}

2. Reporting Requirements

a. Creation of Waste

In addition, hazardous waste generators must register with SEDUE, maintain a monthly log of the hazardous waste they generate and file biannual reports with the agency detailing any movements of hazardous waste.\textsuperscript{123} Generators of waste must maintain monthly records of the amount and type of waste produced.\textsuperscript{124} Logs must indicate the date of movement, the origin and destination of the hazardous waste.\textsuperscript{125} Handlers and TSD facilities must obtain a permit from SEDUE before operating.\textsuperscript{126} SEDUE requires all TSD facilities to submit a training program and emergency accident response plan prior to engaging in any handling activity.\textsuperscript{127}

Furthermore, Hazardous Waste Regulations guide TSD facilities in safe hazardous waste treatment, storage and disposal to protect public

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{118} NTE-CPR-003/88, \textit{Diario Oficial}, December 14, 1988.
\item \textsuperscript{120} See Hazardous Waste Regulations, supra note 111, at art. V.
\item \textsuperscript{121} See General Law, supra note 106, at art. XXVIII, XXIX. Handling means all the operations included in the storing, collecting, transporting, accommodating, reutilizing, treating, recycling, incinerating and disposal of hazardous waste. Hazardous Waste Regulations, supra note 111, at art. IX.
\item \textsuperscript{122} Hazardous Waste Regulations, supra note 111, at art. VII. \textit{But see} Scramstad, \textit{supra} note 17, at 272 n.133 (noting that an EIS filed with SEDUE is not as comprehensive as an EIS required by United States National Environmental Policy Act (NEPA)). A risk assessment study of the ecological effects of the activity and a projection of the steps to be taken to mitigate any adverse impacts is enough to qualify as an EIS. \textit{Id.} NEPA requires greater specificity and commitment and provides for greater public participation.
\item \textsuperscript{123} Hazardous Waste Regulations, supra note 111, at art. VIII.
\item \textsuperscript{124} \textit{Id.}
\item \textsuperscript{125} \textit{Id.} at art. XXI.
\item \textsuperscript{126} \textit{Id.} at art. XX (requiring generators of waste to collect, store, treat, recycle, reuse, incinerate, and ultimately dispose of the hazardous waste).
\item \textsuperscript{127} \textit{Id.} at art. XII.
\end{enumerate}
\end{footnotesize}
health and prevent ecological damage. TSD facilities must store incompatible waste separately, according to their physical state and hazardous characteristics; storage sites must be separate from offices and other work areas; TSD facilities must be equipped with fire extinguishers, lighting rods and other emergency response equipment; and, TSD facilities must comply with all safety regulations, and soil, air and water quality standards.

b. Transportation of Waste

To transport hazardous waste to any of the TSD facilities, generators must acquire from SEDUE manifest forms. Records of the hazardous waste movements must be maintained by generators and transporters for ten years. Generators must also keep records of any tests or analyses of hazardous waste for ten years. Transporters must maintain records for five years from the date they received hazardous waste. Before transporting any hazardous waste, the transporter must obtain from the generator the copies of the manifest; must verify that the waste delivered by the generator is properly stored and identified; must comply with the safety provisions; and must provide SEDUE with a biannual report on the hazardous waste received for transport during the period. To receive hazardous waste, transporters must be duly authorized by SEDUE.

3. Treatment and Disposal Regulations

Treatment and disposal of hazardous waste is similarly regulated. Site selection, as well as design and facility construction, must comply with specific regulations. Three systems for the final disposal of hazardous waste are permitted: controlled containment, containment in stable geological formations, and agrochemical receivers. Construction of a facility is also heavily regulated. For example, construction of a

128. Id. at art. XIV.
129. Id.
130. Id. at art. XV.
131. Id.
132. Id. art. XV-XIX.
133. Id. at art. XXIII (requiring fees in order to obtain the manifest forms).
134. Id.
135. Id.
136. Id.
137. Id.
138. Id.
139. Id. at art. XXIX.
140. Id. at art. XXVI.
141. Id.
142. Id. at art. XXXI, XXXII.
143. Id. at art. XXXI.
controlled containment area must include: containment cells, complementary works, and treatment cells, if needed.\textsuperscript{144} Treatment and disposal facilities must operate in compliance with the applicable regulations.\textsuperscript{145} They must also present a monthly report to SEDUE, with the following information: quantity, volume and nature of the hazardous waste; date of disposal; location of the disposal site; and the disposal system used for each type of waste disposed.\textsuperscript{146} In case of spills or other emergencies, SEDUE must be notified in writing within three days so it can prescribe or instigate appropriate safety remedial measures.\textsuperscript{147}

Article LV of the Hazardous Waste Regulations requires hazardous waste produced by maquiladoras that use raw materials imported into Mexico under the temporary importation provisions must be returned to the country of origin. The Hazardous Waste Regulations, however, permit maquiladoras that use raw materials imported into Mexico under the temporary importation provisions to nationalize or export the hazardous waste.

\textit{a. "Nationalization" of Hazardous Waste}

To nationalize hazardous waste, the Secretariat of Commerce and Industrial Development (SECOFI), Customs (Aduana) and SEDUE must accept the maquiladora waste. Prior to nationalizing the hazardous waste, the maquiladora must pay import taxes.\textsuperscript{148} The maquiladora must obtain an Ecological Clearance Certificate (Guía Ecológica) from SEDUE to nationalize the maquiladora waste.\textsuperscript{149} SEDUE bases its authorization on the information provided on the Guía Ecológica by the maquiladora.\textsuperscript{150} The Guía Ecológica provides information such as the name of the generator, the destination, and the dangerous characteristics of the waste.\textsuperscript{151} Authorization is limited to individuals domiciled in the country.\textsuperscript{152} The waste then becomes Mexican waste subject to SEDUE's jurisdiction.

\textit{b. Exporting Hazardous Waste}

The exportation alternative requires maquiladoras to prepare a request for export authorization (pedimiento de exportación) which is filed

\begin{itemize}
\item \textsuperscript{144} \textit{Id.} at art. XXXII.
\item \textsuperscript{145} \textit{Id.} at art. XXXIII-XLII.
\item \textsuperscript{146} \textit{Id.} at art. XXXIV.
\item \textsuperscript{147} \textit{Id.} at art. XLII.
\item \textsuperscript{148} \textit{See} Hazardous Waste Regulations, \textit{supra} note 111, at art. 47.
\item \textsuperscript{149} \textit{Id.} at art. 43, 44.
\item \textsuperscript{150} \textit{Id.} at art. 45.
\item \textsuperscript{151} \textit{Id.}
\end{itemize}
with SEDUE.\textsuperscript{153} Maquiladoras are required to obtain such authorization to have their bond reimbursed.\textsuperscript{154} Any maquiladora importing hazardous substances to be used in the manufacturing, processing or assembling process must pay a bond.\textsuperscript{155} The pedimiento is required for the maquiladora to have its bond returned.\textsuperscript{156} Once SEDUE authorizes the appropriate manifest and the maquiladora has prepared the pedimiento, SEDUE clears the hazardous waste for export.

Most environmentalists consider Mexico's environmental laws comparable to United States environmental laws.\textsuperscript{157} Concerns, therefore, are not with the written law but with enforcement practices.\textsuperscript{158} For example, most maquiladoras do not return hazardous waste to its country of origin.\textsuperscript{159} Indeed, only 19\% of maquiladoras complied with the requirement to return hazardous waste to country of origin.\textsuperscript{160} Furthermore, they do not comply with the regulations to nationalize and properly dispose of the waste.\textsuperscript{161} Mexico has a history of lax environmental enforcement and many believe that maquiladora hazardous waste has contributed substantially to the current pollution problem.

\textbf{VI. MEXICO'S ENFORCEMENT PRACTICES}

In the past, Mexico, like other developing countries, pursued an aggressive economic development policy, sacrificing its environment by exploiting its resource base.\textsuperscript{162} Mexico is now emerging from a period where it carried out development with minimal environmental considerations. Environmentalists and other opponents of NAFTA have focused on environmental problems created by the maquiladora industry to derail NAFTA.\textsuperscript{163} They argue that Mexico is more lax about regulating the

\begin{itemize}
\item \textsuperscript{153} \textit{Id.} at art. 43 [hereinafter, pedimiento].
\item \textsuperscript{154} \textit{Id.} at art. 47.
\item \textsuperscript{155} \textit{Id.}
\item \textsuperscript{156} \textit{Id.}
\item \textsuperscript{157} \textit{See GAO, supra} note 16, at 5 (noting that Mexico's environmental laws when supplemented by NTEs will be comparable to United States regulatory regime).
\item \textsuperscript{158} \textit{Id.} at 8 (noting that SEDUE's enforcement priority is to improve inspection capacity).
\item \textsuperscript{159} \textit{See McKeith, supra} note 8, at 246.
\item \textsuperscript{160} \textit{Id.}
\item \textsuperscript{161} \textit{Id.} at 245.
\item \textsuperscript{162} \textit{See Lucio Cabrera Acevedo, Legal Protection of the Environment in Mexico, 8 CAL. W. INT'L J. 22, 22 (1978).} Many less developed countries (LDCs) that spend little on environmental protection can attract foreign investment. \textit{See LaDou, supra} note 46, at 46. Over the last decade, foreign investment accounted for 60\% of all industrial development in LDCs. \textit{Id.} In Mexico, maquiladoras accounted for virtually all manufacturing jobs created in the 1980s and a fifth of Mexico's overall manufacturing base. \textit{Id.} at 47-48. As developing nations enact more stringent laws promoting the environment and occupational safety, manufacturers move to LDCs with fewer or no environmental laws or no enforcement. \textit{Id.; see also} Eliza Patterson, \textit{International Trade and the Environment: Institutional Solutions, 21 ENVTL. L. REP. 10599 (1991)} (noting that laws that promote full use of natural resources encourage resource exploitation).
\item \textsuperscript{163} \textit{See Surge in Foreign Investment, INST'L INV., S 10} (July, 1991). 
\end{itemize}
environment than the United States. They cite the rising number of United States firms establishing maquiladoras in Mexico as evidence. Environmentalists in the United States and in Mexico blame the maquiladora industry for border area pollution.

SEDUE has sole jurisdiction for enforcing the Hazardous Waste Regulations. Prior to the enactment of the regulations, inspections were typically limited to those facilities that registered with SEDUE under the self-reporting system. SEDUE did not inspect facilities that failed to register nor did it take action against them for nonregistration.

Under the newer laws, non-authorized activities are crimes punishable by criminal and/or monetary sanctions. Once the allowed grace period is expired, SEDUE may levy the following sanctions: a fine of 20 to 20,000 days of minimum wages in effect at the time the sanction is imposed; temporary or definitive, partial or total shut-down of the offending manufacturer (including maquiladoras); and up to 36 hours of administrative arrest. SEDUE may also suspend or revoke the environmental impact authorization. In the event of reoccurrences in the same year, SEDUE may increase the fine to twice the original sanction, without exceeding double the maximum allowed.

Mexican policy addresses and makes significant commitments to protect the border area environment in efforts to ensure that NAFTA is approved. In fact, President Salinas has committed additional funds to hire and train new inspectors in the border area. It is clear that Mexico is making notable environmental enforcement commitments.

These commitments include improving its monitoring, and tracking and auditing practices of the maquiladora industry. Health concerns, increased media attention and the prospect of NAFTA are driving Mex-

164. Id.
165. Id; see also Patrick J. McDonnell, supra note 10, at A1 (noting that border area residents are concerned with hazardous waste discharges by maquiladoras and fear greater discharges with free-trade); Amy Wallace, Trade Pack Comes Under Attack from Environmentalist, L.A. TIMES, Oct. 19, 1991, at B1 (noting that NAFTA opponents, including Sierra Club, criticize United States and Mexico for failing to specify costs of solutions or where future resources to address problems could come from).
166. Id. at art. 2. Authorities from the Federal District, the States and municipalities may assist SEDUE in enforcing the regulations. Id.
167. See Rose, supra note 1, at 237.
168. Id.
169. Id. at art. 58, 60.
170. Id.
171. Id. at art. 59.
172. Id. at art. 60.
173. See BORDER PLAN, supra note 4, at 21.
174. Id.
175. See GAO, supra note 16, at 9.
ico's new environmental commitments. As evidence of its efforts to protect the border environment, half of SEDUE's inspections along the 2000 mile border have resulted in temporary closures of the polluting plant processes. In July 1992, SEDUE jailed the operator of a hazardous waste dump site in Mexicali for permitting illegal dumping by local maquiladoras. In May 1989, SEDUE required all plants to comply with its toxic waste treatment regulation before discharging any waste water into the sewer system. Plants that do not comply with SEDUE's requirements can be fined up to $70,000, and those responsible face a prison sentence of up to six years. It is too early to tell if maquiladoras are complying with this requirement. However, SEDUE has begun to respond to citizen reports of polluting factories. Some give as much credit to border residents as to SEDUE for the increased enforcement.

A. Obstacles to Effective Enforcement of Environmental Laws

Even after these examples, it is still clear that Mexico's environmental movement is embryonic. Mexico's regulations of hazardous waste are only a few years old. Also, unlike the United States environmental movement, Mexico's environmental movement is principally the result of government initiative. Thus, Mexico's commitment to environmental protection is facing many obstacles, including a lack of accurate information and monetary resources. A lack of accurate information prevents

176. See Satchell, supra note 1, at 32. The American Medical Association has described the border area as a virtual cesspool and breeding ground for infectious disease. Id. Pollution at the border area is rapidly deteriorating and seriously affecting the health and economic vitality of the border area. Id. Industrial waste and raw sewage discharge into canals and rivers are causing widespread gastrointestinal illness and hepatitis. Id. Border area residents and maquiladora employees complain of headaches, vision, respiratory, skin, and other health problems. Id. at 32-34. Increased cancer deaths and severe birth defects of infants born to maquiladora workers are cited as evidence of the impact NAFTA will have on the border area. Id. Women employed by maquiladoras are three times more likely to give birth to children with health complications. Id. In 1982, Dr. Isabel de la O Alonso began seeing children with degrees of retardation ranging from mild to profound, and with unusual physical characteristics such as webbed and deformed hands and feet. Id. She also documented a rise in the infant mortality rate. Id. In all cases, a clinical history revealed a common link: each of their mothers worked at an electrical components maquiladora. Id.; see also Acevedo, supra note 162, at 23; McDonnell, supra note 10, at A1.

On June 25, 1992, William K. Reilly, the former Administrator of the EPA, said that he was stepping up efforts to find out what is causing mothers in the Brownsville-Matamoros area to give birth to babies missing all or a major part of their brain. Id. He acknowledged that maquiladoras may be contributing to fatal birth defects, as well. Id.

178. Id.
179. Id.
180. Id.
181. Id.
182. Id.
183. Id.
184. See McDonnell, supra note 21, at Metro 1.
Mexico from assessing the seriousness and full extent of its environmental problems, while the lack of resources deters it from adequately performing its environmental responsibilities.  

No one knows how many maquiladoras produce hazardous waste, the amount of waste produced or how the waste is disposed. Although the severity of the maquiladora hazardous waste problem is not fully known, most agree that maquiladoras are major generators of hazardous waste in the border area.

Efforts by SEDUE, with cooperation and assistance from the EPA, are underway to develop the empirical data necessary to determine the quantity of hazardous waste maquiladoras produced and how they dispose of it. The EPA sent the first environmental attache, Anne Alonso, to Mexico to assist SEDUE in the development of an integrated border plan. Alonso stated that the closing down of 300 environmental violators and SEDUE's increased budget were indications of the Mexican government's commitment to protecting the environment.

SEDUE's and EPA's efforts, however, have been hampered by uncooperative maquiladora managers who deny investigators access to their plants. The refusal of the United States Department of Commerce (DOC) to share with SEDUE its list of companies participating in the maquiladora program has added an additional obstacle. The DOC has refused to disclose information on companies participating in the maquiladora program because it does not want to discourage them from complying with required reporting procedures.

Finally, Mexico's own monetary constraints is an obvious barrier. Tied to Mexico's monetary constraints are political constraints which most experts agree are also a significant impediment to environmental protection. Further, Mexican public officials consider the maquiladora industry vital to Mexico's economy because it is a safety net for border area inhabitants.

Mexico's monetary constraints are the major impediment to devel-

186. Id.
187. See Sanchez, supra note 17, at 184 (noting little empirical data available supports hypothesis that maquiladoras are major generators of hazardous waste); Scramstad, supra note 17, at 257 (noting that United States-owned maquiladoras in Mexico are major generators of hazardous waste).
188. Id.; see also BORDER PLAN, supra note 4, at 2-3; Sanchez, supra note 17, at 171.
190. Id.
191. See LaDou, supra note 58, at 47-48.
192. Id.
193. Id.
195. Id.
196. See Sanchez, supra note 17, at 163-64; Rose, supra note 1, at 224.
197. Id.
oping the necessary empirical data and adopting sound enforcement practices.\textsuperscript{198} Mexico lacks the funding, human resources, and technology to achieve sweeping surveillance of hazardous waste generators, transporters and TSD facilities.\textsuperscript{199} Also, Mexico's lack of a sophisticated tracking system makes tracking hazardous waste virtually impossible.\textsuperscript{200} Finally, Mexico's hazardous waste reporting requirements are a recent development whose benefits have not yet been fully realized.\textsuperscript{201}

Despite these problems, Mexico has made significant progress in environmental enforcement. For example, the Mexican government has dramatically increased SEDUE's funding to enforce environmental regulations.\textsuperscript{202} Mexico has committed $460 million for border area environmental projects for 1992-1995.\textsuperscript{203} In 1992, Mexico overspent its commitment of $150 million by about $10 million.\textsuperscript{204} The increased funding and training of SEDUE's personnel has enabled greater detection of violators.\textsuperscript{205} Mexico has increased the number of inspectors designated to cover the border area to around 100, a doubling of the 1990 enforcement staff.\textsuperscript{206} SEDUE is expected to increase the number to 200.\textsuperscript{207} The World Bank, impressed by Mexico's efforts, approved an $80 million loan for the next four years to help Mexico protect the environment.\textsuperscript{208} However, the level of enforcement, although significantly higher, is still insufficient to guarantee the adequate monitoring and protection of the border environment.\textsuperscript{209}

B. Cooperation between SEDUE and the EPA Minimizes Effect of Obstacles

The United States and Mexico are working together to improve enforcement by sharing enforcement information and undertaking new cooperative enforcement initiatives. Pursuant to the \textit{BORDER PLAN}, the

\begin{itemize}
\item \textsuperscript{198} See, e.g., Acevedo, \textit{supra} note 162, at 23 (noting that Mexico is unable to afford cost effective environmental control to the same extent as developed countries).
\item \textsuperscript{199} See McDonnell, \textit{supra} note 10, at A1 (noting that SEDUE lacks the resources, expertise and technology to regulate polluters and properly dispose of hazardous waste). Some argue that environmental regulation, to a great extent, is self-policing in the United States and Mexico. See Rose, \textit{supra} note 1, at 227. Mexico, however, differs because it lacks enforcement capacity to create the necessary deterrent effect required for self-policing. \textit{Id}.
\item \textsuperscript{200} See McDonnell, \textit{supra} note 10, at A1.
\item \textsuperscript{201} See LaDou, \textit{supra} note 58, at 48-49.
\item \textsuperscript{202} See \textit{BORDER PLAN}, \textit{supra} note 4, at 3.
\item \textsuperscript{203} \textit{Id}.
\item \textsuperscript{204} See \textit{North American Free Trade Agreement Greeted with Suspicion by Environmental Groups}, 15 \textit{INT'L ENV'T. REP.} (BNA) 562 (1992).
\item \textsuperscript{205} See McDonnell, \textit{supra} note 10, at A1 (noting that SEDUE has embarked on a much-publicized crack-down and has temporarily shut down many maquiladoras).
\item \textsuperscript{206} See McDonnell, \textit{supra} note 10, at A1.
\item \textsuperscript{207} See Wise, \textit{supra} note 4, at 9.
\item \textsuperscript{208} See Solis, \textit{supra} note 9, at R17.
\item \textsuperscript{209} \textit{Id}.
\end{itemize}
United States has filed two criminal indictments and ten civil actions for violations of federal air pollution, toxic substance, community right-to-know, and hazardous waste laws. The Mexican government has shut down nearly 2,000 factories, 109 of them permanently in recent years.\textsuperscript{210} Also, SEDUE and EPA are expanding the joint planning, training and education programs to improve the United States and Mexican understanding of environmental conditions in the border area. To better understand the border area, they are conducting an inventory of legal and illegal waste disposal sites to project future capacity needs for safe management of hazardous waste.\textsuperscript{211} They are also establishing a computer-based information clearinghouse on pollution prevention and other clean technologies.\textsuperscript{212} Finally, efforts to coordinate research by universities and other academic institutions, as well as promoting greater public awareness and participation, are also underway.\textsuperscript{213}

Mexico's efforts, however, go beyond merely cooperating with the United States to improve the border area. Mexico recognizes that accurate and complete information is a prerequisite to effective enforcement of its environmental laws. Mexico is working to collect such information, and is especially focused on information regarding border area maquiladoras. Mexico is also working to improve the effectiveness of its enforcement efforts by strategically publicizing its enforcement activities to encourage wider voluntary compliance and increase the deterrent effect of its actions.\textsuperscript{214} Thus, greater cooperation and the sharing of information between SEDUE and EPA regarding training and technology, along with Mexico's own efforts, should continue to aid SEDUE's enforcement ability and should minimize any negative environmental impacts that may result from NAFTA.\textsuperscript{215}

VII. LIKELY ENVIRONMENTAL IMPACT OF NAFTA ON THE BORDER AREA

Views regarding the impact of international trade on the environment differ. To the international trade community, free international trade offers the means to increase wealth and to diffuse technology, both of which enhance a society's ability to protect and improve its environ-

\textsuperscript{210} See Report of the Administration on the North American Free Trade Agreement and Actions Taken in Fulfillment of the May 1, 1991 Commitments 123 (September 18, 1992) [hereinafter Report of the Administration on NAFTA].

\textsuperscript{211} Id. at 124.

\textsuperscript{212} Id.

\textsuperscript{213} Id. at 124-25.

\textsuperscript{214} Id. at 133.

\textsuperscript{215} See Border Plan, supra note 4, at 3 (noting that although the initial purpose of the Border Plan is to address existing environment problems, over the long-term, it is intended to protect border area resources).
The international trade community maintains that international trade is not the cause of environmental degradation. Rather, international trade allows countries to trade in world markets for goods and technology to facilitate environmental protection. As per capita income rises, boosted by market access and expanding trade, countries allocate more resources for environmental protection. A country with a stagnant economy, by contrast, will not have the resources to engage in environmental protection. The international trade community regards NAFTA as a "win-win" situation not only for itself but for the people inhabiting the border area. Trade advocates argue that NAFTA's increased economic prosperity will generate additional resources to enable Mexico to enforce its laws and clean up past environmental abuses.

By comparison, environmental groups argue that unrestricted trade harms the environment, especially when a country's environmental policies are weak or nonexistent, and its enforcement practices are lax. They expressed concerns that the effect of trade liberalization increases demand for goods which exerts exploitative pressures on natural resources and the environment. To them, unrestricted trade is incompatible with resource conservation, environmental protection and long-term sustainable development. They link environmental degradation in LDCs to export-oriented development policies. They view talk of Mexico's commitment to environmental protection and Mexico-United States increased cooperation as an effort by the United States and Mexico to win support for NAFTA.

The fears that NAFTA will undermine United States environmental laws and will exacerbate the degradation of Mexico's environment by encouraging United States businesses to relocate to Mexico are unfounded. First, NAFTA does not undermine United States environmental laws because NAFTA itself calls for upward harmonization of environmental standards and regulations in North America. Articles 714(1), 906(1) and 906(2) confirm the NAFTA Parties' commitment to upward harmonization of their environmental laws and enforcement practices. Because NAFTA calls for upward harmonization, and be-

216. See GATT, supra note 75, at 19.
217. Id. at 20.
218. Id.
219. Id.
220. See Wise, supra note 4, at 10 (noting that economic prosperity under NAFTA will permit Mexico to strengthen environmental enforcement to achieve higher environmental quality).
221. Id.
223. Id.
224. Id.
225. Article 714(1) states that "Without reducing the level of protection of human, animal, or plant life or health, the Parties shall . . . pursue equivalence of their respective sanitary or phytosani-
cause the United States will be permitted to prohibit the importation of products that do not comply with United States environmental and health regulations, the United States environmental laws will not be undermined.

Second, NAFTA will not promote environmental degradation in Mexico because NAFTA itself forbids the creation of “pollution havens” to encourage economic investment. During the NAFTA negotiations much was heard about the lack of environmental laws and, more importantly, SEDUE’s spotty environmental enforcement record of existing laws. Concerns were raised that NAFTA-induced trade activity, combined with SEDUE’s weak enforcement of environmental laws, would intensify the degradation of Mexico’s natural resources and its environment.

The argument was that by lowering environmental standards, or failing to enforce them, Mexico would reduce cost of domestic production, vis-a-vis the other Parties, thereby creating a trade advantage with respect to the United States and Canada. Article 1114(2), however, addresses this concern and prohibits the creation of pollution havens by any member nation. Article 1114(2) states: The Parties recognize that it is inappropriate to encourage investment by relaxing domestic health, safety, or environmental measures. Accordingly, a Party should not waive or otherwise derogate from such measures as an encouragement for the establishment, acquisition, expansion, or retention in its territory of an investment of such an investor. If a Party considers that another Party has offered such an encouragement, it may request consultation with the other Party and the two Parties shall consult with a view to avoid any such encouragement.226

Even if NAFTA did not prohibit the creation of environmental havens, it would not result in the severe flight of United States industry that environmentalists claim. Studies of the flow of investments show that environmental policies neither significantly nor systematically affect investment decisions.227 For environmental policies to have a significant affect on the location of investment, environmental cost compliance must

226. Id. at art. 1114(2).
227. See Michael S. Barr et al., Labor and Environmental Rights in the Proposed Mexico-United States Free Trade Agreement, 14 Hous. Int'l L.J. 1, 25 (1991); cf. Satchell, supra note 1, at 32; United States Trade Representative, Review of U.S.-Mexico Environmental Issues 7 (February 1992) (noting that investment decisions are not likely to be affected by differences in environmental policies).
represent a significant share of the total operating cost. Evidence suggests that for over eighty-five percent of all companies in the United States, environmental cost compliance comprises less than two percent of the total cost. Industries with higher costs of pollution compliance are very capital intensive, which means that there are high costs for shutting down in the United States and opening a plant in Mexico. These costs would make it economically non-efficient for a plant to relocate solely to take advantage of a favorable short-term environmental regulatory climate in most cases. Moreover, most United States industries with high abatement costs already have low tariffs, so NAFTA will create few, if any, new trade incentives to relocate.

Arguably, companies with obsolete plants that are considering opening a new plant, might find it economical to open the new plant in Mexico rather than the United States. However, given Mexico’s current commitment to enforcing its environmental laws, it is unlikely that any rational business would base its decision to relocate or open new plants in Mexico solely to take advantage of Mexico’s current favorable environmental climate. A decision to relocate or to open new plants in Mexico is more likely due to Mexico’s lower wages, which are as low as one-tenth, if not lower, of United States wages for similar employment.

NAFTA goes further than just the commitment to enhancing environmental protection, it explicitly states that one of its purposes is to promote “sustainable development.” Although sustainable development is not easily defined, and not all agree on the concept, it offers a framework for understanding the need for, and the benefits derived from, uniting trade and environmental concerns. The essence of the concept is that economic and environmental concerns cannot be treated separately. To protect the environment, attention must be paid to develop-

228. Id. Some argue that for NAFTA to effect the location investment for environmental reasons, at least four conditions must exist:

(1) environmental compliance costs must represent a significant portion of the total operating cost;
(2) existing trade barriers must be significant;
(3) relocating costs or costs to create new capacity must not exceed compliance costs; and,
(4) environmental cost compliance in the two nations must be sufficiently different to encourage investment based on these differences.

229. Id.

230. Id. at 8.

231. Id.


233. See NAFTA TEXT, supra note 225, at Preamble. Also included in the preamble is a commitment to engage in trade activity in a manner consistent with environmental protection and conservation to safeguard the public safety and strengthen the development and enforcement of environmental laws and regulation. Id.

234. See Stewart Hudson, Trade, Environment, and the Pursuit of Sustainable Development 2
ment needs. Similarly, development will not be sustainable in the long-term if attention is not paid to the environment.

From a sustainable development perspective, environmental concerns and trade activities are not at odds and should be addressed in an integrated fashion. A trade policy or agreement that does not consider environmental impacts will undermine the natural resource base on which continued, or future, development depends. Similarly, an environmental policy that does not consider development needs can be equally short-sighted.

Unfortunately, only a few environmental groups and few members of the international trade community support NAFTA’s sustainable development commitment. To many in the international trade community, a strong dose of free trade is the only solution to Mexico’s environmental dilemmas. The Bush Administration, for the most part, held this view. The Clinton Administration, fortunately, has indicated a willingness to supplement NAFTA with additional environmental measures. It plans to clarify NAFTA’s text to explain, among other things, what is meant by sustainable development. With the objective of protecting the North American environment, the Clinton Administration and the other NAFTA Parties are currently negotiating supplemental agreements that will become part of the NAFTA package.

Environmental groups and others opposed to NAFTA mistakenly argue that international trade degrades the environment. They prefer unilateral trade restrictions as means of environmental protection. While protectionism might be justified for some industries, at certain stages in a nation’s development, the application of a protectionist trade policy is never the most effective. Unilateral trade restrictions are not efficient instruments for dealing with environmental problems and offer only “second-best” solutions. Unilateral trade restrictions increase the costs of environmental improvements by promoting economic inefficiencies. Environmental solutions on the basis of trade impediments will waste the potential contribution that international specialization can

(1991), reprinted in NATIONAL WILDLIFE FEDERATION, TRADE AND THE ENVIRONMENT (Information Packet, January 1, 1993). See also GATT, supra note 75, at 20 (noting that sustainable development means different things to different people but that generally it encompasses the idea that each generation should pass on to the next at least as much capital—environmental and man-made—as it inherited).

235. For example, Rep. Richard Gephardt called for a cross-border tax to help finance border environmental protection. See Gutfeld, supra note 8, at R9. See also McDonnell, supra note 10, at A1; see also McSlorrow, supra note 3, at 10590 (noting that environmentalists would use international trade arrangements as a means to impose environmental standards on other nations); Patterson, supra note 110, at 10600 (suggesting that countries should be permitted to impose special fees and regulations on products based on environmentally harmful characteristics).

236. Id.

237. Id.
make to the global environment. Free trade can make a country more competitive, thereby generating the necessary economic resources for it to employ new, less polluting technologies. Rather than pursuing unilateral trade restrictions, international trade should be used to encourage environmental protection based on a sustainable development policy. International trade offers the means to increase wealth and to diffuse technology, both which enhance a society's ability to protect and improve its environment.

Assuming that opponents of NAFTA are successful in preventing its passage, Mexico will nonetheless continue to participate in international trade and a few United States firms will invest (i.e., relocate or open new plants) in Mexico, especially the border area. Investment in Mexico, as evidenced by the fifteen to twenty percent annual growth experienced by the border area maquiladora industry over the last five years, is extremely likely to continue. Absent NAFTA, United States investment will continue to be concentrated on the border area worsening the border area environment. The criticism that the border area infrastructure lacks sufficient roads, sewers and water treatment facilities to support rapid development is legitimate. However, if NAFTA is not approved, the Mexican government is likely to place greater reliance on border area maquiladoras, accelerating development in the border area and worsening the border area environment.

The solution to Mexico's environmental dilemma, therefore, lies not in the rejection of NAFTA but in cooperative efforts to reduce pollution emissions and to improve Mexico's environmental enforcement practices. Over time, as tariff barriers decline because of NAFTA, there will be increasingly less incentive to establish maquiladoras in the border area. Similarly, as U.S. businesses become familiar and accustomed to Mexican business practices, they will locate further south to be closer to Mexico's domestic markets, suppliers and workers. This will ease the strains on the border area infrastructure.

Given that Mexico will continue to participate in international trade and that some United States firms will relocate or open new plants in Mexico, opponents should concentrate on suggesting and introducing policies to address the remaining legitimate environmental concerns. For example, the meaning of the phrase "derogate from" in Article 1114(2) is

238. See Bergeijk, supra note 222, at 107.
239. See Hudson, supra note 2, at 4 and n.12.
240. See GATT, supra note 75, at 21; Hudson, supra note 2, at 8.
241. Id. at 20.
242. See Satchell, supra note 1, at 32.
243. Id.
244. See GAO, supra note 5, at 2.
245. BORDER PLAN, supra note 4, at 27 (noting that hazardous waste prevention programs are being investigated and some implemented).
unclear and should be clarified. Article 1114(2), as well as the other articles related to environmental protection, lack concrete and adequate enforcement mechanisms. Further, NAFTA lacks a timetable and process for the continued upward harmonization of environmental standards. Also, a mechanism to finance environmental infrastructure, pollution prevention and remediation activities related to NAFTA trade should be incorporated into the NAFTA package. Finally, the functions of the North American Commission on Environment (NACE), and public participation under the agreement, should be clearly and explicitly incorporated in the NAFTA package.\(^{246}\)

Most importantly, perhaps, is the need to clearly set forth the NAFTA Parties' official position on sustainable development. This should be thoroughly and clearly addressed in the supplemental environmental agreements. Public debate should focus on the link between trade and the environment. All of those concerned, especially border area inhabitants, should be permitted to participate in the debate.

VIII.
CONCLUSION

Criticism of NAFTA focused public attention on the relationship between international trade and the environment. This criticism started a dialogue and increased public awareness and cooperation between industry, government and public groups. Safe, effective, and efficient disposal of hazardous waste is at the core of the environmental problems at the border and is a matter of corporate, government and public responsibility. Public debate should now shift from criticizing NAFTA to addressing the link between trade and the environment. True, there is some validity to the concerns of both environmentalists and free trade advocates. Environmental regulations can be used as cover for trade protection. Similarly, free trade can undermine environmental policy measures and cause environmental degradation. From a sustainable development perspective, environmental concerns and trade activities are not at odds and should be addressed jointly. Continued public debate on trade and the environment, therefore, should address how trade and environmental measures can be integrated to achieve sustainable development. Studies should be conducted to identify the obstacles preventing the integration of trade and the environment to achieve sustainable growth.

In the long-run, NAFTA will not sustain the benefits of more liberal trade if environmental and natural resource consideration are not taken

\(^{246}\) Currently, all supplemental side-agreement negotiations, including negotiations related to NACE, are confidential. Very little is known about how the supplemental agreements will deal with the issue of trade and environmental protection. However, some groups have provided some specific suggestions for what the supplemental agreements should contain and what the United States Congress should expect as the NAFTA package. See generally Hudson and Prudencio, supra note 2.
into account. Conversely, a policy of environmental protection will not be successful if it ignores the development needs of the people affected. Mexico needs economic development, and it will pursue development with or without NAFTA. Those seriously interested in long-run environmental protection must have reasonable short-term demands and expectations of Mexico's ability to protect its environment. They must work with the Mexican government to accumulate complete and accurate information to make sound economic and environmental decisions consistent with sustainable development.

Also essential to the success of a sustainable development policy is the cooperation and commitment of industry. Industry needs to realize the benefits of self-regulation and start implementing policies consistent with sustainable growth. Multinational corporations, especially, must recognize the potential for adverse publicity by environmentalists and the media if they fail to cooperate to minimize environmental degradation. They must realize that they are not only part of the problem but also crucial to the solution. An industry that is flexible, cooperative, acts voluntarily and adopts an "environmentally-responsible" corporate strategy will create for itself a competitive advantage. Ron Brown, United States Secretary of Commerce, has urged businesses from all countries to act more responsibly to protect the environment.

If we are going to reverse the negative environmental trends affecting the world environment, and especially the border area, the NAFTA package must incorporate a development policy that is both economically and environmentally sustainable. Vital to this effort is cooperation and sincere, honest debate by environmentalists, free trade advocates, government officials and the public at large.

247. See Scramstad, supra note 17, at 289 (noting that corporate responsibility in environmental matters is the theme for 1990s).