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**THE ROLE OF TWO NAFTA INSTITUTIONS IN DEVELOPING WATER INFRASTRUCTURE IN THE U.S. – MEXICO BORDER REGION**

***Abstract***

This document was written in 2001 as chapter for an edited volume titled "Both Sides of the Border: Transboundary Environmental Management Facing Mexico and the United States" which is scheduled for publication in 2002. The book uses the border region as an case study for identifying factors shaping the environmental challenges specific to international borders and the solutions currently being implemented. This document evaluates two institutions created by a side accord to the North American Free Trade Agreement (NAFTA) to promote water and wastewater infrastructure projects in the U.S.-Mexico border region. These institutions represents a unique cooperative attempt to address through a trade agreement the environmental infrastructure needs of a transboundary region. Development assistance provided by these organizations is innovative because of its focus on producing debt-financed and user-fee-supported projects that are shaped by public participation. Between 1995 and 2000, the two institutions helped develop forty water and wastewater projects. Although these projects represent considerably more investment in environmental infrastructure than had been made in previous years, projects supported by the two institutions only covered 13% of the water and wastewater infrastructure needed for the region.

***Resumen***

Este documento fue escrito en 2001 como un capítulo para un volumen editado intitulado: "*Both Sides of the Border: Transboundary Environmental Management Facing Mexico and the United States*"(Ambos lados de la frontera: manejo ambiental transterritorial enfrentado por México y los Estados Unidos) el cual está programado para publicación en 2002. El libro usa la región fronteriza como un caso de estudio para la identificación de los factores que forman al desafío ambiental de territorios fronterizos y las soluciones que actualmente están implementadas. Este documento evalúa dos instituciones creadas por un acuerdo paralelo al Tratado de Libre Comercio de América del Norte para promover proyectos de agua y saneamiento en la región fronteriza. Su creación representa un intento cooperativo único para el desarrollo de infraestructura ambiental en una zona fronteriza a través de un tratado de comercio. La asistencia suministrada por estas instituciones es innovativa por su enfoque en proyectos financiados a través de deudas y cobros a usuarios por los servicios y desarrollados con participación pública. Entre 1995 y 2000, las dos instituciones mencionadas ayudaron a desarrollar cuarenta proyectos de agua potable y saneamiento. Aunque estos proyectos representan significativamente más inversión en infraestructura ambiental que en años pasados, los proyectos apoyados por las dos instituciones cubrieron solamente el 13% de la necesidad de infraestructura de agua y saneamiento en la región.

*Acronyms*

| | |
|---|---|
| BANOBRAS | Banco Nacional de Obras y Servicios Públicos |
| BECC | Border Environment Cooperation Commission |
| BEIF | Border Environment Infrastructure Fund |
| CEC | Commission for Environmental Cooperation |
| CNA | Comisión Nacional de Agua |
| EPA | U.S. Environmental Protection Agency |
| GNP | Gross National Product |
| IBWC | International Boundary and Water Commission |
| IDP | Institutional Development Cooperation Program |
| JMAS | Junta Municipal de Agua y Saneamiento |
| NADBank | North American Development Bank |
| NAFTA | North American Free Trade Agreement |
| PDAP | Project Development Assistance Program |

## *Introduction* *

Decades of rapid industrialization and population growth along the U.S.-Mexico border have strained the water and wastewater infrastructure capacity of this transboundary region, thus contributing to a degradation in its environmental and human health. Negotiations for the North American Free Trade Agreement (NAFTA) in the early 1990s brought public attention to environmental problems of the border. In 1993, U.S. President William Clinton and Mexican President Carlos Salinas de Gortari announced an $8 billion initiative to address the pressing environmental problems in the area one hundred kilometers on each side of the international boundary. This area, referred to as the "border region," grew in population from 6.6 million in 1980 to an estimated 12 million in 2000 (Ham-Chande and Weeks, 1992; Southwest Center for Environmental Research and Policy, 1999). A $3 billion component of the $8 billion environmental initiative was the creation of two binational organizations—the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank). These two organizations have worked together to promote sustainable development of the border region by supporting water, wastewater, and solid waste infrastructure projects.[1] NAFTA-related environmental concerns also led to a side-agreement creating the Commission for Environmental Cooperation (CEC) for handling environmental legal disputes between the United States, Canada, and Mexico.

In this chapter, we analyze BECC's and NADBank's accomplishments in the area of water and wastewater infrastructure during the period from their initial operation in early 1995 through December 2000. These organizations represent significant components of the two governments' cooperative attempt to address the environmental problems of the shared border region. The analysis is limited to what BECC and NADBank call "water pollution" and "wastewater" projects.[2] Water pollution projects can include, but are not limited to: *(1)* potable water treatment; *(2)* water supply systems; *(3)* water pollution prevention; and *(4)* projects to improve or restore quality of water resources. Wastewater treatment projects can include: *(1)* wastewater collection systems; *(2)* wastewater treatment plants; *(3)* water reuse systems; and *(4)* systems for treatment and beneficial use of sludge. Our assessment is based on data collected from February to December 1997, and periodically from 1998 through early 2001. We gathered data from personal interviews with

* An earlier version of this chapter titled "Working Toward Sustainable Water and Wastewater Infrastructure in the US-Mexico Border Region: A Perspective on BECC and NADBank" appeared in the International Journal of Water Resources Development (December 2000).

[1] NADBank also arranges financing for community adjustment projects for communities with significant job losses due to changes in trade patterns as a result of the trade agreement.

[2] BECC and NADBank classify water projects as environmental projects because the two organizations interpret "environment" as including both the natural and human environment.

municipal, state, and federal officials in Mexico and the United States and with BECC and NADBank staff. We also collected data through reviews of BECC files, participation in public meetings, observations as a participant in the U.S. Environmental Protection Agency (EPA) Region IX Border Water Group, and research in Mexican and U.S. border communities.

### *Evolution of Border Water Cooperation*

Binational attention to the region's water resources started in the mid-1800s because a number of rivers define and cross the international boundary. The U.S. and Mexican governments first formally attempted to address border sanitation problems through the International Boundary and Water Commission (IBWC). A 1944 binational treaty established the IBWC to manage all international water projects and water resource disputes involving the two countries' shared border, including disputes over territorial limits and water allocation. Since the 1970s, rapid industrialization and population growth in the border region created problems that were beyond IBWC's original mandate and resources. Only a few IBWC projects directly addressed the urban water infrastructure and treatment needs of the growing border communities. Moreover, critics claim that IBWC has been ineffective because of its slow, secretive, top-down approach (Vanderpool, 1997; Spalding and Audley, 1997; Ingram, 1996; Ingram et al., 1995).

The failure of IBWC to address growing environmental concerns resulted in other attempts at binational cooperation. The 1983 Agreement on Cooperation for the Protection and Improvement for the Environment in the Border Area (the "La Paz Agreement") established a framework for addressing a comprehensive range of environmental issues, including water. In response to concerns that NAFTA would result in rampant growth and aggravate existing environment problems in the border region, BECC and NADBank were added to the mix of institutions working on border water issues. The side agreement to NAFTA that created BECC and NADBank recognized IBWC's continuing role in border wastewater projects, and thus it required BECC and IBWC to cooperate in the planning, development, and implementation of border sanitation projects and other environmental activities.

### *BECC and NADBank's Approach to Assistance*

BECC and NADBank were designed to play an active role in fostering environmental infrastructure to protect public health and the environment within the border region. Located in Ciudad Juárez, Chihuahua, BECC's primary roles are to provide technical assistance to border communities developing projects and to certify environmental infrastructure projects in the border region for financing consideration by NADBank and other sources. NADBank, in San Antonio, Texas, facilitates financing for the implementation of BECC-certified projects and provides financial and managerial

guidance for border communities with projects. This division of functions was intended to avoid a conflict of interest: the entity involved in fostering project development (BECC) is different from the organization involved in financing (NADBank) (Varady, 1996).

BECC and NADBank are unique as international development organizations not only because of this bifurcation of responsibilities but also because of their approach to development assistance. They focus on promoting "sustainable development" as the concept is presented in the Brundtland Commission's Report to the World Commission on Environment and Development: development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987).[3] BECC and nadbank's involvement in individual projects is guided by the agreement creating the two institutions, which states that environmental infrastructure projects should be operated and maintained through user fees and subject to local or private control.

*Project Certification: Border Environment Cooperation Commission.* The purpose of BECC is "to help preserve, protect and enhance the environment of the border region in order to advance the well-being of the people in the United States and Mexico" (U.S. Department of State, 1993). To carry out this agenda using its $3 million annual budget (appropriated by the U.S. and Mexican Congresses), BECC does not develop or manage individual projects. Instead, it promotes and certifies projects. Border water and sewer service providers develop their own projects and propose them for BECC certification. BECC's criteria for certification are intended to assure investors and border communities that projects meet requirements in the following topical areas: human health and environment, technical feasibility, financial feasibility and project management, community participation, and sustainable development (See Table 1). In short, BECC provides technical assistance to ensure that the projects it promotes benefit the border region.

In addition to providing technical assistance, BECC also coordinates the activities of numerous public organizations engaged in efforts to enhance water and sewer services in the border region. In order to coordinate the development of water and sewer projects, BECC has created coordinating committees involving an array of agencies at various levels of government. These committees typically include members from the following: EPA, *Comisión Nacional de Agua* (CNA, Mexico's National Water Commission), U.S. Department of Agriculture, U.S Public Health Service, IBWC, state utilities, state governors' offices, state environmental agencies, and municipal authorities, and local steering committees.

BECC's staff developed the certification criteria based on guidelines set forth in the agreement creating BECC and NADBank and using extensive public input. Sixty-nine members of the public submitted comments on the 1995 draft of BECC's criteria. The criteria were revised and adopted in September 1995. BECC later revised

[3] BECC acknowledges projects that satisfy binationally accepted indicators of sustainable development through its High Sustainability Development Program.

*Table 1*
BECC Certification Criteria

| *Topical Area* | *Subject of Certification Criteria* |
|---|---|
| General Criteria | · Project Type<br>· Project Location<br>· Project Description and Work Tasks<br>· Conformance with International Treaties and Agreements |
| Human Health and Environment | · Human Health and Environmental Need<br>· Environmental Assessment<br>· Compliance with Applicable Environmental and Cultural Resource Laws |
| Technical Feasibility | · Appropriate Technology<br>· Operation and Maintenance Plan<br>· Compliance with Applicable Design Standards |
| Financial Feasibility and Project Management | · Financial Feasibility<br>· Fee/Rate Model<br>· Project Management Capacity |
| Community Participation | · Comprehensive Community Participation Plan<br>· Report Documenting Public Support |
| Sustainable Development | · Adherence with Sustainable Development Principles<br>· Institutional and Human Capacity Building<br>· Conformance with Applicable Local and Regional Conservation and Development Plans<br>· Natural Resource Conservation<br>· Community Development |

Source: BECC, 1996.

the criteria adopted in 1995 in order to reflect the knowledge gained from operating experience. In 1996, a draft of BECC's new criteria was presented for public comment. Based on our 1997 review of BECC files, the 1996 draft received approximately forty-six public comments. After responding to these comments, BECC adopted a final set of criteria in November 1996.

BECC's certification criteria, particularly the community participation requirements, increase the transparency of border water and wastewater project development. For example, the certification criteria require project applicants to have a comprehensive community participation plan that consists of forming a local steering committee, meeting with local organizations, allowing public access to project information, and holding at least two public meetings. The service provider (typically a water and/or sewer utility) responsible for a project must submit a report documenting both the implementation of this community participation plan and public support for the project. BECC's promotion of public participation in project development and decision-making represents a significant change from IBWC's closed approach. Moreover, extensive public participation is different from typical decision-making processes in Mexico and within international development organizations. Based on an analysis of public participation in BECC, two researchers at the University of Arizona, argue:

> . . . by stressing community participation BECC provides groups from both sides of the border with new resources for mobilization. BECC has not only encouraged the emergence of new groups, but [also] it has created new spaces for debate, facilitated the exchange of ideas and information, and improved access to data and funding sources (Lemos and Luna, 1999).

The public also participates in BECC's own operations. Applications for certification are reviewed by BECC's staff, which makes recommendations to BECC's Board of Directors and distributes project information for public review and comment. A binational Advisory Council, which consists of border residents, also advises the Board of Directors. The Advisory Council is intended to provide an avenue for public input into BECC activities and certifications. The decision process of the Board of Directors also has a public component. After reviewing project applications, the Board votes on certification at a meeting that is open to the public.

Notwithstanding BECC's procedural requirements, public participation has not been problem free. In Mexico, limited information and constraints on resources available to border communities have limited the extent of citizen participation in planning for water and sewer projects. Based on their analyses of a project in Nogales, Sonora, Lemos and Luna (1999) argued that BECC should "strictly enforce its mandate for public involvement in project certification." Other analysts, such as Mumme and Sprouse (1999), have noted that compliance with public participation following BECC certification is problematic because BCC has no mechanisms to enforce those requirements.

*Project Financing: North American Development Bank.* Once BECC's Board of Directors votes to certify a project, the project is eligible for a NADBank financing package. Despite its name, the North American Development Bank does not operate like the World Bank or other traditional development banks. Including the word "development" in the name of the North American Development Bank helped the Clinton administration sell NADBank to the public (Browne, 1996). But to sell NADBank to Congress, the administration limited the federal allocations that the Bank would receive, and it eliminated features that resembled foreign assistance. Ostensibly at least, a traditional development bank transfers resources from wealthier nations to poorer ones. In NADBank's case, however, the United States, with an annual gross national product (GNP) of over $6 trillion, contributed the same amount to capitalize NADBank as Mexico, whose GNP was roughly 4% of the United States' GNP in 1994 (Browne, 1996).

As of December 2000, NADBank had a capitalization of almost $3 billion dollars—$349 million in paid-in capital and $2.55 billion in callable capital. NADBank is authorized to use its paid-in capital to make direct loans to communities and to guarantee payment of a community's non-NADBank loans (in order to encourage investments by other lenders). The Bank's callable capital is money that the U.S. and Mexican federal governments pledged to make available in the unlikely case that a large number of NADBank borrowers fail to repay their loans. Because NADBank must preserve its capital and cannot borrow in the tax-exempt bond market, it lends primarily at market-based interest rates.

NADBank can leverage its limited resources into substantial financing for environmental infrastructure projects by creating financing packages that combine NADBank loans with loans and grants from other government entities and private investors. NADBank provides loans to fill financing gaps that are not covered by other sources. Loans made or guaranteed by NADBank are for specific projects, not general programs. The projects must be certified by BECC and be financially self-sustaining; i.e., fees collected for water and sewer services must both cover operation and maintenance costs and up to twice the cost of repaying creditors.

The capital structure of NADBank allows it to lend to utilities that otherwise have difficulty accessing financing from commercial markets, (e.g., NADBank can loan to small utilities borrowing one or two million dollars or less). NADBank also offers other financial services, such as loan guarantees and "gap purchases" of bond issues. In a gap purchase, NADBank buys the portions of a bond offer that are not quickly bought by private investors. NADBank assists in the financing of projects by acting as an investment banker, a source of financial advice, and a coordinator of grants and loans from multiple sources.

*Management of Border Environment Infrastructure Fund Grants.* In 1997, NADBank signed an agreement with the U.S. Environmental Protection Agency (EPA) that gave NADBank responsibility for managing that agency's Border Environment Infrastructure Fund (BEIF), which receives appropriations from the U.S. Congress (NADBank, 1997a). Grants from the fund can be used for border water and

wastewater projects that are either in the U.S. or in Mexico, but projects in Mexico must benefit the United States. BECC and NADBank's existence has permitted this groundbreaking use of U.S. funds for projects affecting the region's shared environment regardless of the project's location

EPA maintains final oversight over the use of BEIF grants. Using a set of project selection criteria and affordability guidelines, NADBank analyzes if a project is eligible to receive BEIF grants. The guidelines differ somewhat for U.S. and Mexican projects. U.S. projects are eligible for assistance if the project cost per household exceeds 1.7% of the median household income (NADBank, 1997b). CNA determines which Mexican projects are eligible for BEIF support by using Mexico's Municipal Poverty Index (NADBank, 1997c). BEIF grants for projects can be used for construction costs to make a project affordable for a community. They can also be used to ease a community's adjustment to higher user fees over time; eventually, however, operation and maintenance costs must be covered by user fees.

For projects that qualify for BEIF assistance, NADBank determines the size of the grant for a project using factors such as: the socio-economic characteristics of the area; and the water and sewer utility's current debt burden, other available sources of funding, and ability to assume debt. As of December 2000, NADBank had used criteria linked to the affordability of projects to approve $249 million in BEIF grants. For Mexican projects, CNA and state sources generally match BEIF grants.

*Assistance for Capacity-Building Activities of Service Providers.* Because of BECC and NADBank's focus on improving the environment of the border region, the two institutions are concerned about the operation and benefits of the projects they support. Believing that sound planning and management of projects were essential for producing environment protection, BECC and NADBank created two programs that strengthened the capacity of border water and wastewater utilities. One of these, a grant program for technical assistance called the Project Development Assistance Program (PDAP) was established by BECC in 1997. The program, which assists utilities and other types of service providers with the development of water and wastewater projects intended for BECC certification, is funded by a $22.5 million grant from the U.S. Environmental Protection Agency. Examples of activities funded through PDAP grants include: preparing municipal master plans, technical feasibility studies, and preliminary design documents; and conducting mapping and surveying, environmental assessments, financial feasibility studies, and public participation programs. By December 2000, PDAP support used on certified projects and projects pursuing certification totaled $16.7 million. BECC also operates a management training program that trains Mexican utility operators on how to enhance their capacity to meet local environmental infrastructure needs.

A second grant program, the Institutional Development Cooperation Program (IDP), assists public utilities in achieving effective and efficient operations by reinforcing their institutional capacities thus creating a stronger financial foundation that will support the development of future infrastructure (NADBank, 1997d). NADBank established this program using a portion of the earnings on its paid-in

capital. As of December 2000, NADBank had used IDP to assist sixty-four communities with a total of ninety-three projects, and it had committed a total of $6.6 million worth of IDP funds (NADBank, 1999). The types of activities funded include: updates of the user registries and development of utility management systems, surveys of the water distribution systems and related information systems, and water loss and repair studies. In 1999, NADBank initiated as part of its IDP effort a Utility Management Institute, which trains the border region's water and sewer utility professionals in long-term utility organization, administration, finance, and management (Lehman, 1999).

Between 1997 and 2000, PDAP and IDP were particularly important in the improved development of projects for small U.S. border municipalities, and the programs were critical to the development and financing of Mexican projects. For example, IDP grants assisted local branches of Mexican state utilities to improve billing and collection systems, update user registries, and install working meters. Capacity-building for utilities was significant because it helped to ensure that environmental infrastructure investments in the border region were not wasted because of lack of maintenance and technical, financial, and management expertise. In part because of BECC and NADBank's insistence on local control of projects, local branches of the Mexican state-level water and sewer utilities became involved at unprecedented levels in project development and implementation. The capacity-strengthening activities funded through PDAP and IDP helped these local branches to assume expanded roles in facility construction and operations. By investing to strengthen the capacity of border utilities, BECC and NADBank hoped to ensure the long-term integrity of projects they certified and financed.

### *BECC and NADBank's Project-Specific Accomplishments*

BECC and NADBank were not created to solve the water and wastewater problems of particular border communities. Rather, their mandate is to support the development and financing of environmental infrastructure projects in the entire border region. To gauge what they have accomplished for the border region, we first present data on BECC certifications and NADBank financing packages completed by December 2000. We then compare the financing packages for the projects to the estimated financial need for water and wastewater infrastructure in the border region.

BECC began accepting project applications in May 1995. As of December 2000, fifteen Mexican water and wastewater projects and twenty-five U.S. projects had earned BECC certification. More U.S. projects were certified than Mexican projects because, in general, U.S. projects were smaller and easier to certify. In most cases, U.S. projects were well-developed before reaching BECC; often they had been developed with assistance from federal or state subsidy programs or in response to health and environmental regulations. Moreover, U.S. service providers more easily fulfilled BECC's criteria than their Mexican counterparts because they had previous

experience with similar requirements. Many federal and state grant programs and permits involved conditions that overlapped with BECC's certification criteria.

By December 2000, twelve of the fifteen Mexican projects listed in Table 2 had requested funding for construction. The other three projects received IDP or PDAP funds, but they did not request further financial assistance. All but one of the twelve NADBank-financed projects received a BEIF grant. And a total of $102 million worth of BEIF grants were allocated to Mexican projects. Although NADBank had only issued $7.26 million in loans, that number was expected to increase because loan packages for three of the projects were still being negotiated as of December 2000.

Table 3 provides a breakdown of BECC-certified, NADBank-financed projects in the United States. In contrast to the situation in Mexico, a relatively small fraction of the twenty-two U.S. projects receiving NADBank support involved loans. This occurred because U.S. communities had easier access to capital markets and state grant programs (compared to Mexican communities), and they were able to secure loan financing at better rates than NADBank could offer. However, the twenty-two U.S. communities are similar to those receiving NADBank assistance in Mexico in that nearly all of them took advantage of BEIF grants.

NADBank's financial activities for water and wastewater projects in the border region can be summarized as follows. As of December 2000, the Bank had approved about $249 million in BEIF grants and five loans totaling $10 million. In addition, three other loan packages were being developed. The total value of the financing packages that NADBank had participated in was $927 million. Only one project with NADBank financing—Brawley's water project—was complete by December 2000. Nineteen were under construction, and twelve were in bidding and design phases. BECC and NADBank are working with another twenty-one communities to develop infrastructure projects for future certification and financing.

As mentioned, NADBank had not made many loans for border projects, especially in the United States. For eighteen of the twenty U.S. projects with NADBank financing packages, NADBank's participation consisted of only BEIF grants; *i.e.*, no NADBank loans were involved. Its loans represented only 3% of its paid-in capital.

Although NADBank did not participate as a significant lender in many of the financial packages that it coordinated, the packages included other debt-financing mechanisms. Before investigating NADBank's lending further, we summarize the different levels of investment needed in water and wastewater infrastructure for the U.S. and the Mexican portions of the border region.

*Table 2*
NADBank Financial Packages in Mexico
(as of December 2000, in millions of U.S. dollars)

| *Mexican Community* | *Population* (in thousands) | *PDAP* and/or IDP | *NADBank* Loan | *BEIF* Grant | *Total Project* Cost |
|---|---|---|---|---|---|
| CONSTRUCTION COMPLETED | | | | | |
| Matamoros, TAM (private project) | 23 | 0.20 | no participation | no participation | no participation |
| UNDER CONSTRUCTION | | | | | |
| Ciudad Acuña, COAH | 113 | 0.28 | - | 21.18 | 80.35 |
| Ciudad Juárez, CHIH | 1,100 | 0.33 | 4.58 | 11.08 | 31.16 |
| Mexicali, BC | 635 | 0.32 | - | 20.62 | 57.36 |
| Naco, SON | 6 | 0.19 | 0.18 | 0.42 | 1.62 |
| Nogales, SON | 215 | 0.87 | being designed | being designed | 39.00 |
| Piedras Negras, COAH | 133 | 0.09 | - | 12.83 | 57.42 |
| Reynosa, TAM | 474 | 0.08 | - | 8.09 | 83.40 |
| Tijuana, BC | 113 | 0.30 | 2.5 | 16 | 19.52 |
| UNDER DESIGN | | | | | |
| Palomas, CHIH | 7 | 0.19 | - | 1.88 | 5.18 |
| Región Cinco Manantiales, COAH | 30 | - | being designed | - | 17.50 |
| San Luis Rio Colorado, SON | 170 | 0.64 | - | 5.93 | 13.50 |
| Tecate, BC | 66 | 0.25 | being designed | 3.72 | 7.81 |
| Tijuana, BC (Ecoparque) | NA | 0.04 | no participation | no participation | no participation |
| REDEFINED | | | | | |
| Ensenada, BC | 250 | 0.25 | no participation | no participation | no participation |
| MEXICO TOTAL | 3,335 | 4.03 | 7.26 | 101.75 | 413.82 |

Sources: BECC and NADBank 2000; NADBank 2000.

*Table 3*
NADBank Financial Packages in the United States
(as of December 2000, in millions of U.S. dollars)

| *U.S. Community* | *Population (in thousands)* | *PDAP and/or IDP* | *NADBank Loan* | *BEIF Grant* | *Total Project Cost* |
|---|---|---|---|---|---|
| CONSTRUCTION COMPLETED | | | | | |
| Brawley, CA | 27 | - | 0.97 | - | 24.80 |
| Douglas, AZ | 14 | 0.50 | no participation | no participation | no participation |
| El Paso, TX (NW Reclaimed Water) | 90 | - | no participation | no participation | no participation |
| UNDER CONSTRUCTION | | | | | |
| Alton, TX | 6 | 0.05 | - | 0.26 | 14.47 |
| Calexico, CA | 26 | 0.04 | - | 6.5 | 11.30 |
| Donna, TX | 20 | 0.24 | - | 3.49 | 21.62 |
| El Paso, TX | 47 | 0.63 | - | 14.9 | 37.82 |
| El Paso County, TX (Lower Valley) | 40 | 0.33 | - | 17.5 | 98.35 |
| El Paso County, TX (on-site treatment) | 1 | - | no participation | no participation | no participation |
| Heber, CA | 3 | 0.29 | - | 1.08 | 3.38 |
| Mercedes, TX | 15 | 0.24 | 1.87 | 0.9 | 11.16 |
| Roma, TX | 21 | 0.20 | - | 5.6 | 34.18 |
| San Diego, CA | 1,200 | - | - | 17.2 | 99.59 |
| Somerton, AZ | 6 | 0.08 | - | 1.07 | 3.44 |
| Westmorland, CA | 2 | 0.05 | - | 1.98 | 4.41 |
| IN BIDDING PROCESS | | | | | |
| Berino, NM | 0.5 | 0.22 | no participation | no participation | no participation |
| Del Rio, TX | 42 | 0.04 | - | 14.18 | 36.50 |
| Heber, CA | NA | 0.07 | - | 2.53 | 4.34 |
| Laredo, TX | 4 | 0.26 | - | 6.23 | 21.58 |
| UNDER DESIGN | | | | | |
| Brawley, CA | NA | 0.32 | - | 6.39 | 13.56 |
| Nogales, AZ | 220 | 0.14 | - | 39.5 | 46.10 |
| Patagonia, AZ | 1 | 0.22 | - | 0.77 | 1.26 |
| Sanderson, TX | 1 | 0.05 | - | 0.35 | 3.60 |
| Texas Plan for Hookups | 23 | 0.02 | - | 6.36 | 8.82 |
| BEING REDEFINED | | | | | |
| Somerton, AZ | NA | 0.25 | no participation | no participation | no participation |
| U.S. TOTAL | 1,810 | 4.24 | 2.84 | 146.79 | 500.28 |

Sources: BECC and NADBank 2000; NADBank 2000.

### *Public Expenditures Needed for Border Water and Wastewater Infrastructure*

During the NAFTA negotiations, various groups published estimates of the public expenditures needed for the border region's water and wastewater infrastructure between 1994 and 2003. We reviewed estimates by the U.S. Department of Commerce ($8.7 billion), the U.S. Department of Treasury ($3.8 billion), the U.S. Council of the Mexico-U.S. Business Committee ($5.3 billion), and the Sierra Club ($7.0 billion).[4] We selected the Sierra Club's estimates for the analysis presented herein because those estimates were the most detailed and well-documented, and they included water and wastewater infrastructure expenditures for both conveyance and treatment. Table 4 summarizes the Sierra Club's estimates of public spending needed for the border region's water and wastewater infrastructure.

*Table 4*
Sierra Club's Estimates of Public Spending Needs for Water and Wastewater Infrastructure in the U.S.-Mexico Border Region for 1994-2003
(in billions of U.S. dollars)

| | *U.S.* | *Mexico* | *Total* |
|---|---|---|---|
| Water | 1.07 | 0.94 | 2.02 |
| Wastewater | 1.68 | 3.33 | 5.01 |
| Total | 2.75 | 4.27 | 7.03 |

Source: Sierra Club, 1993.

Because of the distinct economies of the two countries, the Sierra Club's estimates do not provide a complete picture of the need for border water and wastewater infrastructure in Mexico compared to the United States. One billion U.S. dollars spent on infrastructure in Mexico builds considerably more capacity for water and wastewater treatment, water distribution, and wastewater collection than one billion dollars spent on infrastructure in the United States. This difference is useful in interpreting the public spending needs estimated for each country in Table 4. It suggests that the need for facilities is significantly greater in Mexico than in the U.S.

Another difference between the infrastructure deficit in Mexico and the U.S. relates to the size and character of the communities with the greatest unmet needs. In Mexico, the shortfall in water distribution, sewage collection, and treatment is most urgent in large urban areas. Wastewater in Mexican border municipalities is particularly problematic because of the substantial fraction of total wastewater that is linked to industrial development. Mexico's "Border Industrialization Program," which was initiated in 1965, sparked economic development in Mexico's urban centers in the border region. This program granted the Mexican side of the border

[4] For details on this, see Carter (1999).

region a special economic status that permitted foreign-owned industries to own and operate assembly plants in Mexico. At these plants, referred to as *maquiladoras*, Mexican laborers assemble imported parts and materials. Finished goods are exported with only the value added in Mexico being taxed. By 1990, over two thousand maquiladoras directly employed five hundred thousand workers, primarily low-income laborers that relocated to the border from the interior of Mexico (Corcoran, 1997). The Mexican government initiated the Border Industrialization Program to alleviate unemployment, to relieve population pressure on Mexico City and other metropolitan areas, and to provide a source of foreign currency. The program was not accompanied by investment in infrastructure to support either the industrialization or the expanding Mexican border population.

Growth in Mexico's border municipalities resulted in increased demand for urban infrastructure, but the means to finance water distribution, sewage collection, and treatment projects in Mexico did not improve. Wastewater generated in urban centers, such as Mexicali and Tijuana, far exceeded the capacity of treatment facilities, resulting in raw waste being discharged into rivers and ocean waters. By the early 1990s, only 34% of the Mexican sewage collected along the border received any treatment (General Accounting Office, 1996). All thirty-nine Mexican border municipalities, including fourteen municipalities with populations over one hundred thousand, needed major investments in water and sewer systems and treatment facilities.5 In addition to this lack of municipal treatment capacity. Many low-income migrants to Mexico's border municipalities built homes on vacant land that lacked public service. In the early 1990s, 18% of urban households in Mexican border municipalities lacked potable water, and 40% were not connected to sewage collection systems (Betts and Slottje, 1994).

In contrast to the need in Mexico which was greatest in large urban centers, the need for water and wastewater infrastructure in the U.S. border region during the 1990s was most urgent in small municipalities and "colonias." The U.S. General Accounting Office defines colonias as "rural, unincorporated subdivisions along the U.S.-Mexico border, in which one or more of the following conditions exist: substandard housing, inadequate roads and drainage, and substandard or no water and sewer facilities" (General Accounting Office, 1990, 1). Of the more than four hundred thousand people in the U.S. who lived in colonias in 1990, 85% lived in Texas border counties. In Texas, colonias generally lacked adequate water and wastewater disposal facilities for their residents because colonia developers (before 1989) were not required to provide water and wastewater services. The State of Texas responded to its growing colonia population through legislation restricting the development of new colonias and the creation of a program to subsidize the construction of water and sewer systems in Texas colonias. The three other border states also had colonias, but the scale of the problem was not as large as it was in

[5] A Mexican municipality consists of a city plus the surrounding less-densely settled area, and thus the municipal government is comparable to a consolidated city-county government.

Texas. California's colonia population was 32,000; Arizona's was 15,000 and New Mexico's was 14,600 (General Accounting Office, 1990).

Colonias are not the only communities needing assistance in the U.S. border region. Many small U.S. border municipalities also require improvements in their water and sewer facilities because of their growing populations. In 1990, three of the ten fastest growing metropolitan areas were located in Texas along the border (Texas Legislature, 1996). Although the border economy grew substantially from 1970 though the 1990s, U.S. border residents were among the poorest in the nation. In 1990, Webb and Starr Counties along the Texas-Mexico border were among the ten poorest of all U.S. counties, and Laredo, Texas (in Webb County) was the poorest city in the U.S. (Texas Legislature, 1996). The combination of rapidly expanding populations and a high proportion of low-income residents made it difficult for small U.S. border municipalities to finance needed improvements to their water and wastewater facilities. Many small municipalities struggled to operate and maintain their systems, much less to expand them. As a result of their limited budgets, small border municipalities often postponed maintenance of systems, thus exacerbating the stress on their water and sewer systems caused by their increasing populations.

In the early 1990s, only 7% of the U.S. border cities and towns had populations above fifty thousand (BECC, 1996). Large U.S. border municipalities generally possessed adequate technical, financial, managerial, and administrative staff to maintain well-functioning water and sewer systems and to finance expansion and construction projects (although they often needed assistance in addressing the needs of adjacent colonias). Consequently, twenty-two of the twenty-five U.S. projects certified by BECC as of December 2000 were serving less than 50,000 border residents.

### *BECC and NADBank's Experience in Providing Needed Financing*

As mentioned, BECC and NADBank were part of a larger scheme--the $8 billion environmental initiative for the border region announced by Presidents Clinton and Salinas in 1993. Although BECC and NADBank were not the only organizations addressing the shortfall in water and wastewater infrastructure in the border region during the 1990s, the data on estimated need in Table 4 provides a basis for putting the impact of BECC and NADBank's activities on the border region in perspective.

This is done in Table 5, which indicates that U.S. projects certified by BECC and financed by NADBank packages covered 18% of the estimated U.S. need. In contrast, Mexican projects covered only 9.7% of the estimated public need in Mexico. Although BECC-certified and NADBank-financed projects (as of December 2000) address only 13% of the total estimated need for the border region, the eleven Mexican projects and twenty-two U.S. projects represent an unprecedented number of border region projects in development. In their six years of operation between 1995 and 2000, BECC and NADBank worked on eight times more border wastewater

*Table 5*
Impact of BECC and NADBank's Activities Through December 2000 on Estimated Water and Wastewater Need in the U.S. Mexico Border Region for 1994-2003

| | *U.S.* | *Mexico* | *Total* |
|---|---|---|---|
| Estimated Need (hereafter Need)[a] | $2.75 billion | $4.27 billion | 7.03 billion |
| Cost of Public Projects with NADBank Financing Packages from 9/1996 to 12/2000 (hereafter Cost)[b] | $500 million | $414 million | $914 million |
| Cost as % of Need | 18% | 9.7% | 13% |
| % of Need Covered by NADBank-financed projects Each Year[c] | 4.2% | 2.3% | 3.0% |
| NADBank Debt Used for Project Financing[d] | $2.84 million | $7.26 million | $10.1 million |
| NADBank Debt as % of Need | 0.10% | 0.17% | 0.14% |
| NADBank Debt as % of Cost | 0.6% | 2% | 1% |

[a] Need figures are from Table 4.

[b] Cost figures are for the public projects shown in Tables 2 and 3.

[c] This calculation is made using the years between the financing of the first project in September 1996 and the end of the analysis in December 2000—4.3 years.

[d] NADBank debt figures are from Tables 2 and 3.

infrastructure projects than the IBWC did in its almost sixty years of work on border sanitation issues. Since the first binational wastewater treatment plant in 1951, IBWC has spent less than $1 billion (in 2000 dollars) on construction of wastewater facilities in the border region; this money was spent on the Nuevo Laredo, Nogales, and South Bay (in San Diego) treatment plants and facility planning for the New River/Mexicali treatment facilities .

The significance of BECC and NADBank's contributions to border projects is exemplified in a colonia-related project that was certified in 1999 and received financing in 2000. NADBank played the role of "dealmaker" by providing key funding for water and sewer hookups for colonia households benefiting from a Texas' program that subsidized water and sewer systems in colonias.[6] The Texas subsidy program—the Economically Distressed Areas Program—did not provide funding for household connections. Using BEIF grants as a start, NADBank attracted money from other sources. The final NADBank financing package enabled colonia households in seven communities to connect to water distribution lines and wastewater collection lines that had been constructed through the Economically Distressed Areas Program. Without NADBank's financing package for household connections, the state's investment in the distribution and collection systems would

[6] Telephone interview conducted by Nicole Carter with a representative of the Office of Texas Secretary of State representative, 31 March 2000.

have failed to provide many colonia residents with needed water and sewer services. In February 2001, NADBank approved another BEIF grant to assist with household connections and water and wastewater improvements for fifteen colonias outside Laredo, Texas. BECC certified the Laredo project in September 2000.

Much of what BECC and NADBank can accomplish within their mandates is shaped by the funding for border infrastructure. For the last three years, the U.S. Congress has provided less than the EPA's request for border environmental funding. Instead of providing the $100 million requested for 2001, EPA's border funding is $75 million with $9.5 million of this earmarked for specific projects (U.S. Congress, House, 106th Legislature).

*Obstacles and Opportunities for NADBank's Lending.* Although NADBank has played a significant role in projects through BEIF grants, it has experienced difficulty lending in the United States because water and sewer service providers can obtain less expensive debt-financing elsewhere, e.g., from State Revolving Funds and municipal bond markets. In general, U.S. utilities did not seriously pursue NADBank's participation in projects until after NADBank began administering BEIF grants. U.S. utilities were encouraged by the BEIF grants because these grants were earmarked for border communities, and the utilities could access the grants relatively easily. Prior to BEIF, the main subsidies for U.S. border projects (with the exception of funding for colonia projects) were for international wastewater projects through the IBWC. These projects received direct allocations from the U.S. Congress. Obtaining funding for these projects required political clout, and most border communities, with the exception of the City of San Diego, were not politically powerful.

NADBank's participation in Mexican projects has been limited for reasons related to the institutions for delivering water and wastewater services and projects. State water and sewer utilities and their local branches provide water and sewer service to Mexican border municipalities.[7] To satisfy the BECC certification criteria, local branches of state utilities must take responsibility for developing and implementing their own projects. But most of these local branches had not had extensive experience with planning or building water and wastewater projects. Moreover, because of difficulties in establishing and collecting user fees and upheavals in utility staff due to changes in state political administrations, local branches often lacked the financial and managerial capacities needed to satisfy BECC criteria (Carter, 1999). Managers of state utilities and their local branches were usually either appointed by state governors or selected by appointees of state governors. Their selection was based often more on their political ties than their skills and knowledge of water and sewer utilities. The fourteen certified Mexican public projects were undertaken by utilities working to overcome these impediments, often relying on assistance from BECC and NADBank to do so.

[7] We identified one exception to a state utility providing municipal water and sewer service. A municipally-owned utility—*Junta de Aguas y Drenaje*—serves the municipality of Matamoros, Tamaulipas.

The context of project financing in Mexico provided NADBank with both opportunities and impediments. NADBank was able to loan more for Mexican projects than U.S. projects because Mexican utilities had fewer financing options than U.S. utilities. This greater demand existed partly because Mexican state utilities are denied access to foreign capital. Due to provisions in the Mexican Constitution, only the Mexican federal government can borrow in a foreign currency or with foreign creditors. Moreover, state water and sewer utilities can not work with municipal governments to raise funds through municipal bonds (a common means of financing water and wastewater projects in the U.S.) because a municipal bond market did not exist in Mexico as of 2000.

Mexican utilities and communities were also constrained in their ability to raise funds using taxation. In the 1990s, tax collection in Mexico remained centralized, and the federal government maintained control of over 80% of the federal revenue.[8] Under a revenue-sharing scheme, the federal government disbursed to each state a portion of the remaining 20%. In principle, Mexican border states could offset their water and sewer financing problems by raising state taxes. However, the political feasibility of state governments raising revenue via state taxes was severely limited.

Another possible source of financing was the *maquiladoras*, which were among the largest water and sewer users in Mexico's border municipalities. These plants were also a driving force behind the border population boom. *Maquiladoras*, however, contributed little to financing public infrastructure. Their profits accrued largely outside of Mexico, and their payrolls were so low that payroll taxes were relatively insignificant. A 1990 study of eighty *maquiladoras* in Nuevo Laredo found that together these companies paid only $279,000 in payroll taxes that year—hardly enough to pay for the social services needed by their workers, let alone the cost of infrastructure construction (Barry et al., 1994). As a result of the tax system, the *maquiladoras* are not significantly contributing to the infrastructure that they and their workers use and are actually being subsidized by the governments' investments in infrastructure.

Debt financing was expensive through Mexican government entities such as the *Banco Nacional de Obras y Servicios Públicos* (BANOBRAS, National Bank of Public Works and Services). Nonetheless, competition for BANOBRAS loans is high because a BANOBRAS loan was one of the few available financing options. BANOBRAS lent at an interest rate a few points higher than the interest charged by the Mexican Treasury; in 1999, BANOBRAS was lending at 35.6% (General Accounting Office, 2000).

As a consequence of the limited and expensive options for project financing available to Mexican water and sewer utilities, NADBank's loans for Mexican

[8] The federal government allocates to the states and municipalities 20% of the disbursable purse—*bolsa distruible*—which does not include the revenue the federal government earns from petroleum (Mendoza Berrueto 1996, 177). States depended on federal revenue for about 80% of their annual budgets.

projects at interest rates between 25.5% and 27.1% were attractive (General Accounting Office, 2000). NADBank's loans for the Ciudad Juárez and Naco projects constituted, respectively, 15% and 11% of the financing packages. Because the interest rates for loans in Mexico (including NADBank's) were high, border water and wastewater projects required significant subsidies both from NADBank and Mexican federal and state sources in order to be affordable to border communities.

In early 1999, NADBank developed a mechanism that allowed financing of Mexican public sector projects in a manner consistent with the Mexican Constitution's prohibitions on sub-federal entities borrowing in foreign currencies and from foreign entities. NADBank established a limited-purpose financial institution that channels NADBank financing to environmental infrastructure projects sponsored by Mexican public entities. In late 2000, NADBank began a pilot initiative—the Value Lending Program—using $50 million of the Bank's paid-in capital. The program, which was still under development in May 2001, will lend for water, wastewater, and solid waste projects at lower rates than the NADBank's regular lending program. The reduced rates will make debt-repayment more affordable for low-income border communities.

*Reality of User Fees for Debt Repayment and Facility Maintenance in Mexico.* In order to repay loans, utilities need a revenue stream from their operations. BECC's financial feasibility criteria and NADBank's financial packages require repaying loans through user fees. BECC and NADBank were required to overcome decades of problems related to user fees when they attempted to apply their requirements to Mexican border projects. A vicious cycle of poor service quality and deferred maintenance had evolved among Mexican utilities. The explosive growth of border municipalities contributed to a decline in the quality of urban water and sewer service. Rapidly expanding demand exceeded systems' capacities. Users failed to pay their bills because of the poor service quality and for a variety of other reasons discussed below. Without these user fees, water and sewer utilities could not adequately operate and maintain their facilities, and utilities became dependent on subsidies from state and federal sources for both construction and maintenance activities. Systems quickly degenerated; for example, a $50 gate for the wetland lagoons used to treat Mexicali's sewage was not replaced when it failed, thus cutting treatment efficiency of the lagoons in half.[9] As of December 1995, thirty (33%) of the ninety water treatment plants that had been built in Mexican border states were no longer operating, and many of those that were operating were not at their maximum treatment capacity or efficiency (Navarrete Martínez, 1996).

Collected fees provide insufficient revenue because user fees are set too low and fee collection is often poor. The process used in many states to increase water and sewer rates partially helps explain why rates remain depressed. Service providers propose a new rate schedule for user fees and then send it to the state

[9] Interview conducted by Nicole Carter with a representative of EPA Region IX Water Group, 25 November 1997.

congress for approval. [10] Increasing rates is considered "political suicide" for anyone in politics or with political aspirations because rates affect every voter connected to the systems.[11] As a consequence of the political reality of raising user rates, low rates persist.

User fees are not only too low; they are frequently not collected. Collection rates often dip below 40%. Service providers have trouble collecting fees because it is difficult to penalize customers for failure to pay. Cutting domestic water service was interpreted as unconstitutional for many years because the Mexican Constitution protects access to water as a fundamental right.[12] In the late 1990s as a result of new interpretations of the Constitution, some states have taken measures to permit service providers to cut service. The failure to pay user fees also developed out of a commonly held belief in the right to free water and free public services. This belief, combined with the failure of public service providers to aggressively collect user fees and their inaction against illegal connections to water lines, yielded an informal rule among customers that it was acceptable not to pay. The service providers' behavior can be explained by the fact that they have not been forced to face hard budget constraints or to operate efficiently because of government subsidies.

Mexican border residents have a limited ability to pay for water and sewer service; one estimate is that 51% of Mexico's border residents in the early 1990s lived below the poverty line (Betts and Slottje, 1994). Before BEIF and other grants were available to decrease the amount a service provider would need to borrow, the user fee increases that were required to repay NADBank's loans would have substantially increased the monthly water and sewer bills of low-income customers. These dramatic increases would have indeed amounted to political suicide and would not have been affordable for most border communities.

By carefully combining loans and grants, NADBank developed financing packages with user fees set so that they were affordable for community members, but nonetheless sufficient to provide revenue for operation and maintenance and debt repayment. NADBank works with the community to develop a least cost financing package for the community. The increases in water and sewer rates that NADBank supported in its financing packages appeared to be affordable for low-income customers. The water and sewer rate increases represented real annual

[10] For example, the procedure for a rate schedule increase in Baja California is as follows: the local branch presents its proposed tariff schedule to the administrative council presided over by the state governor. If the council approves the increase, the proposed tariff schedule is presented to the state congress for authorization.

[11] For example in Aguascalientes, a privatization effort resulted in higher user fees. The unpopular rate hike was considered to be a decisive factor in the PRI losing the subsequent municipal election (Pineda Pablos 1999, 220-221).

[12] Ingram, Laney, and Gillilan 1995, 175; Rodríguez 1997, 120. The Mexican Constitution of 1917, Article 27, established that the ownership of all water resources within the borders of Mexico is vested in the nation, and the government is the trustee for the people (Ingram, Laney, and Gillilan 1995, 170). Consequently, for decades, no fee was charged to municipal customers for water and sewer services.

increases of 10-15%. Although this is a significant jump, these higher rates did not exceed 2.3% of the household income based on a single, minimum-wage earner (Carter, 1999). One rule of thumb commonly used by international development banks is that households can afford to pay up to 5% of their income for water and sewer services (Wright, 1997). By using grants to cover construction costs, NADBank's financing packages reduced the loan amount so that repaying the debt was manageable for the community. Proposed rate increases were made politically acceptable because the increases were often characterized as being forced by BECC and NADBank, and the increases were associated with specific projects to improve and expand water and sewer services.

Results from BECC and NADBank's insistence on using fees to finance maintenance and debt repayment are exemplified in a project for Ciudad Juárez. BECC would not certify the wastewater treatment project proposed by the local branch in Ciudad Juárez—*Junta Municipal de Agua y Saneamiento* (JMAS)—until a new rate schedule was devised and implemented. JMAS not only instituted a rate increase of 10% for average residential customers in 1997, but it also increased its water and wastewater fee collection rate from 40% in 1995 to 90% in 1998 and developed an advanced system for managing customer complaints.[13]

In 1996, in order to foster customers' willingness to pay and to temper the politically liabilities of user fee increases, BECC revised its certification criteria to require a public meeting to discuss user fee increases. In some communities, these meetings successfully strengthened public support for increases by clarifying the reasons for the increases and providing assurances that the additional money collected will go to improving local water and sewer service.[14]

### *Uncertainties in the Future of BECC and NADBank*

Although BECC and NADBank contributed to unprecedented levels of border infrastructure investments, the future roles of the two organizations are uncertain. Beginning in Spring 2000, NADBank began investigating the possibility of extending its activities geographically beyond the 100 kilometers of the border region and beyond the current scope of water, wastewater, and solid waste infrastructure. The Bank initiated this effort in order to expand the use its credit resources. In late November 2000 after receiving public input on proposals for an extension of its mandate, NADBank's Board of Directors decided that the Bank should expand its scope beyond the current water, wastewater, and solid waste projects into activities within the current provision of the Bank's charter. In response, BECC decided to certify projects of the following types: industrial and hazardous waste projects (to

[13] Interview conducted by Nicole Carter with BECC's Technical Director, 14 March 1997; Interview conducted by Nicole Carter with Director of Sanitation for JMAS, 17 December 1997.

[14] Interview conducted by Nicole Carter with Director of Sanitation for JMAS, 17 December 1997, Telephone interview conducted by Diana Cardenas with a representative of a U.S. non-governmental border organization, 26 February 1998.

the extent that the waste presents a pollution threat to water or soil); water conservation projects; water and wastewater hookups for housing; and recycling and waste reduction projects. BECC is also considering (on a pilot basis) projects related to air quality, public transportation, and clean and efficient energy, as well as projects that improve municipal planning and development and water management (BECC, 2000). As of May 2001, BECC had not received any applications for projects falling under the new project types that could be certified.

Beginning in August 2000 and continuing into 2001, Mexican President Vicente Fox (who took office in December 2000) demonstrated interest in changing the focus and responsibilities of BECC and NADBank. Fox proposed expanding NADBank beyond its focus on border environment infrastructure; under his proposal, NADBank would be a $20 billion bank financing a broad range of North American development projects (*Los Angeles Times*, 18 August 2000). The expanded Bank would be part of Fox's ambitious plan to form an economic block similar to the European Union in North America. NADBank would manage an "economic convergence fund" aimed at accelerating Mexico's economy, thus facilitating the integration of the three countries. BECC's relationship to the expanded NADBank was not discussed; however in Mexico during early 2001, there was some discussion of moving some of BECC's project development responsibilities to the NADBank (Kelly et al., 2001).

Numerous border non-governmental organizations have expressed concern regarding the changes being proposed by the Fox administration (Kelly et al., 2001; Arizona Toxics Information et al., 2001). They argue that BECC and NADBank still have numerous border water and wastewater issues to address before expansion into other development concerns can be considered and that the two institutions are not equipped to deal with the full spectrum of water issues much less to expand into other areas of development in North America. For example, the Mexican and U.S. border population is projected to increase from 12 million in 2000 to 15 million in 2010 and 19 million in 2020 (Southwest Center for Environmental Research and Policy 1999, 7). This growth will only exacerbate the previously discussed shortfalls in water and sewer infrastructure. Moreover, providing water for the region's growing urban population and industrial sector is increasingly in conflict with the use of water for regional agriculture and instream uses, including species habitat conservation, especially during years with low precipitation in watersheds affecting border water supplies. Neither BECC nor NADBank (nor IBWC) are structured to manage or assist communities in planning the exploitation of their water supplies, which fundamentally affects the water systems being constructed in this post-NAFTA era. BECC and NADBank are limited to construction-based projects and project-by-project development assistance. Neither of these organizations is involved in regional planning, and deficiencies in regional planning are the core of numerous water-related problems including those that stem from the booming border populations. Many border non-governmental organizations argue in spite of these shortcomings BECC and NADBank have significantly contributed to efforts addressing

the environmental infrastructure needs of the region, and what these organizations need is not an expansion into other development areas but increased support for their environmental infrastructure efforts.

## *Conclusions*

In recent decades, the border region has experienced dramatic population growth and industrialization due largely to trade patterns end economic policies. The governments of Mexico and the United States created BECC and NADBank in association with NAFTA to improve and protect the environment of the border region. The two organizations contribute to environmental protection by actively promoting well-crafted water, wastewater, and solid waste infrastructure projects. Between 1995 and 2000, BECC certified forty water and wastewater projects, and NADBank developed financing packages for thirty-one of those projects. These projects represented a significant increase in infrastructure investment in the border region. However, these projects are only the first step in addressing the water and wastewater infrastructure needs of the region. As of December 2000, NADBank financing packages covered only 13% of the water and wastewater infrastructure investment needed between 1994 and 2003, and NADBank's financial participation in projects was overwhelmingly through grants, not loans. BEIF grants constituted 97% of NADBank's financial participation in projects.

During their first six years of operation, BECC and NADBank did not address a substantial fraction of the financing needed for water and wastewater infrastructure, but they succeeded in promoting debt-financed, and user-fee-supported projects developed with public participation. The technical assistance and utility strengthening activities sponsored by BECC and NADBank are expected to contribute to the long-term viability of these projects by strengthening utilities so they cannot only complete the projects but also maintain them and plan for future investments. Even with the progress made under BECC and NADBank, many additional water and wastewater infrastructure investments will have to be made if citizens of the border region are to enjoy basic water supply and wastewater collection services.

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