The United States-Mexico Foundation for Science
Fundación México-Estados Unidos para la Ciencia

BI-ANNUAL ACTIVITIES REPORT 2002-2003

10 years facilitating bi-national collaboration in science and technology to solve problems of bi-national interest

During its first ten years, FUMEC has grown and evolved inspired by the example of Congressman George E. Brown Jr., who was a leading promoter of science and technology collaboration between the two countries, and a key figure in the creation of the Foundation.

"I have asked scientists and engineers to become more involved with the needs of the broader society, in other words, to be more effective citizens. We can begin to do this by planning a series of collaborative agreements driven by common human goals rather than the national policies of any single government".

Congressman George E. Brown, Jr.

George E. Brown, former ranking democratic member of the U.S. House of Representatives in the Science, Technology and Space Committee. His efforts were recognized by the Mexican Government, which awarded him posthumously the Aguila Azteca, the highest honor that can be conferred to a foreigner.

Index

Board of Governors

Honorable Jaime Oaxaca
Chairman
Chairman of the Oaxaca Group

Jaime Parada
Vice-Chairman
General Director of CONACYT

Karl A. Rüggeberg
Treasurer
Associate Director of Paramount Capital, Inc.

Pablo Rudomín
Immediate Past Chair
Member of the National College
Emeritus Researcher of CINVESTAV

Susan Scrimshaw
Past Chair
Dean of the School of Public Health,
University of Illinois at Chicago

Alvaro Aldama
General Director of the Mexican Institute of Water Technologies

Benito Bucay
Director of the BRE Industrial Group

Marta Brown
President and CEO of the George E. Brown Jr. Foundation

Salvador Malo
General Director of the National Evaluation Center for Higher Education

Mario Molina
Professor at the Massachusetts Institute of Technology

Diana Natalicio
President, University of Texas at El Paso

Raúl Quintero
General Director of the Technological Division of HYLSAMEX

Peter Raven
Director of the Missouri Botanical Garden

Jaime Sepúlveda
Coordinator of the National Health Institutes

Clint Smith
Policy Research Scholar at Stanford University

Fernando Solana
President of the Mexican Fund for Education and Development

Guillermo Fernández
Secretary of the Board
FUMEC President and CEO

Letter of the Chairman of the Board

These past two years the Foundation has consolidated its programs and found new and important opportunities to catalyze and facilitate bi-national collaboration in science and technology, that focus on high priority problems of both countries.

In 2003, the Foundation celebrated its 10th Anniversary. We had the privilege to review the results of the Foundation and its role in the future with key leaders in government, academia and business of both countries. A meeting was held in the White House with the Director of NSF and other high level U.S. Government officials, to review the results obtained and to look for future opportunities. Two special receptions were organized with the support of the U.S. Embassy in Mexico and the Mexican Embassy in the United States, as well as other meetings and outreach activities in both countries.

Also in 2003, we had the opportunity to meet in two occasions with President Vicente Fox and the Mexican Secretary of Foreign Affairs, Luis Ernesto Derbez. The first meeting took place during the workshop that was organized by the Foundation jointly with CONACYT and Advanced Micro Devices, to facilitate collaboration between U.S. based Hispanic high tech companies and Mexican businesses, universities and research institutes. The President expressed strong interest in supporting these business to business interactions and was also enthusiastic in the MEMS (Micro-Electromechanic Systems) program that the Foundation is promoting.

A second opportunity to meet with President Fox was during his visit to several U.S. border states, where the collaboration in science and technology was an important issue; in the meeting in Albuquerque we had the opportunity to share with the President the importance of several areas of work of the Foundation like the Bi-national Sustainability Laboratories initiative, in which we collaborate with Sandia National Laboratories and CONACYT, and the potential of the border region to have several bi-national innovation clusters, opening new economic development opportunities related to advanced manufacturing and high technology businesses, for example in the Paso del Norte region (Ciudad Juarez, El Paso, Las Cruces, Santa Teresa).

The U.S. -Mexico border region, of essential importance to both countries, is a beach head to apply the advances of science and technology in the solution of bi-national problems in economic development, security, health and the environment. The Foundation has worked closely with Federal programs, border State Governments and bi-national organizations to identify effective ways to draw on bi-national collaboration in science and technology to address both: urgent issues like waste water treatment, and medium term impact issues such as bi-national innovation clusters to accelerate economic development through technological and business innovations.

Programs previously initiated by the Foundation on the U.S. – Mexico border region dealing with water, health, air quality in large cities, K-12 science education, innovation and pollution prevention in small industries are now well established.

New activities are taking root in important areas such as transgenic maize, global climate change, occupational health. There is also a new initiative to establish a U.S.-Mexico Technology Center in Silicon Valley to open new opportunities for bi-national collaboration in high tech businesses.

The United States and Mexico are finding enormous opportunities to improve bi-national collaboration. Many of these opportunities are in areas where the Foundation is working and where science and technology can be an important component. To facilitate the mobilization of scientific and technological resources of both countries in these cases, we have very close interactions with agencies like: CONACYT, the Mexican Secretaries of Education, Health, Finance, Economy, Agriculture, Environment, as well as with the Departments of Commerce (Economic Development Administration), Housing and Urban Development, Homeland Security, Education, and with agencies like the NSF and EPA.

We believe that organizations like the U.S.-Mexico Foundation for Science, where key leaders in business, academia and government meet to analyze problems and generate bi-national collaboration strategies, can play a valuable role in the definition and launching of suitable and sustainable programs.

In 2003, the Board approved the establishment of offices in Washington D.C. and in El Paso, Texas. The Washington D.C. office was set up with the support of the National Academies to facilitate interaction with government agencies and non-governmental organizations in the North East. The El Paso office was organized in collaboration with the University of Texas at El Paso to consolidate collaboration with the border states and bi-national organizations operating in the region. We are very grateful to both, the National Academies and UTEP for their support.

It has been a privilege for me to serve as Chairman of the Board of Governors of the Foundation. The support of the Members of the Board has been a key factor in the results of the Foundation and in the planning for its future development. We all have great expectations for the renewed bi-national collaboration in science and technology and the role that the Foundation will play to facilitate it.

Honorable Jaime Oaxaca
Chairman of the Board of Governors

President of Mexico Vicente Fox, at the U.S.-Mexico Collaborative: Partnering for Technological Advancement

Letter of the Chief Executive Officer

The 10th anniversary of the Foundation provided a good opportunity for reflection on its goals and to review its programs and results in the context of the evolving United States-Mexico collaboration.

We acknowledge the importance of the vision of the Foundation as an effective mechanism to mobilize the scientific and technological resources of both countries to contribute in the solution of issues of bi-national importance; a vision that was so well articulated by the late U.S. Congressman George E. Brown Jr.

It is a privilege to inform that we have made significant advances in this direction. Many universities and research institutes of the United States and Mexico, which are working closely with FUMEC in areas of importance to both countries, have new and stronger collaboration programs where government agencies and businesses participate.

This happens in areas like water and health, where universities and research institutes in Tamaulipas and Baja California work closely with U.S. universities and organizations such as the Tejeda Center, a specialized NGO linked with Texas A&M, that was established with support of EPA and the NADBANK. Similarly, the initiatives of the Foundation in Migrant Health have crystallized in a Program, with the Mexican Secretary of Health and the University of California, that annually calls for proposals and finances bi-national research projects.

In some cases it has been possible to facilitate the creation of new mechanisms, like INNOVEC, that promotes bi-national collaboration in K-12 Science Education; the Center that is been organized by Dr. Mario Molina for new programs in Environment, that is also based in the previous work done in bi-national research related with Air Quality in large cities; and the Bi-national Sustainability Laboratory, promoted by Sandia National Laboratories and CONACYT jointly with the Foundation, to facilitate bi-national research and technology commercialization related to border issues.

The need to develop bi-national technology and entrepreneurship programs to improve competitiveness and economic development in regions and sectors of interest to both countries, has moved the Foundation to facilitate exchanges and collaboration that links the U.S. experiences and resources in universities, research institutes and government programs with their Mexican counterparts. There are already programs focused in Small and Medium Businesses - like the SATE program – as well as High Tech activities in MEMS, Software and Advance Manufacturing, linked to bi-national production chains, operating with the catalyzing role of FUMEC.

These results come from building strong leaderships within each program, along with the participation of key researchers, business, non-governmental and governmental leaders. All of them required many exploration conferences, technical workshops, pilot projects and outreach efforts. A network of individuals and organizations is built around each of them.

The near term future of FUMEC looks promising, new and stronger ties are being built with key agencies and organizations in both countries. The leadership and advice of the Board of Governors, the commitment of the staff of the Foundation and the continued support from all our excellent partners in both countries, provide the strong pillars on which the work of FUMEC is based.

Guillermo Fernández de la Garza
Chief Executive Officer

The United States-Mexico Foundation for Science

Mission

The Foundation's goal is to promote bi-national collaboration in science and technology to solve problems and address opportunities of mutual interest.

The Foundation was created in 1992 as a bi-national non-governmental body, through an agreement between Mexico and the United States, to promote and support science and technology collaboration between both countries.

Leadership

The Board of Governors is the body that directs and oversees FUMEC activities. It is integrated by eight members from each country that represent the academic community, the business sector, and government.

All of them are distinguished and recognized leaders in their own fields, who actively participate in both countries' scientific and technological life, facilitate communication and collaboration among the various interdisciplinary communities, and freely donate their time, knowledge and energy to the Foundation.

The high prestige of the Board members allows FUMEC to access a wide cross section of regional, federal, private and public networks from both countries.

Financial Stability

The Foundation has an endowment built by contributions from both Federal Governments. The income derived from the interests of this endowment is used to fund exploratory activities that set up the bases for programs and projects, and to cover core operational expenses. This seed capital has been instrumental in mobilizing additional resources, thus playing a multiplier effect.

FUMEC Strengths

- The staunch commitment of the Board of Governors gives FUMEC the ability to identify strategic issues which require the attention of both countries and approach them through an independent perspective; they also provide their support to mobilize business, academic and government networks to address problems and opportunities.
- FUMEC has been able to build articulation mechanisms that result in dedicated involvement of key groups from the academic, business and governmental communities of both countries, working towards common goals.
- The Foundation maintains a culture of flexibility that facilitates the involvement of key stake holders.
- FUMEC's endowment ensures operational stability and provides seed resources that act as a platform to multiply bi-national capacities and resources.

Programs

Introduction

Creation of Programs

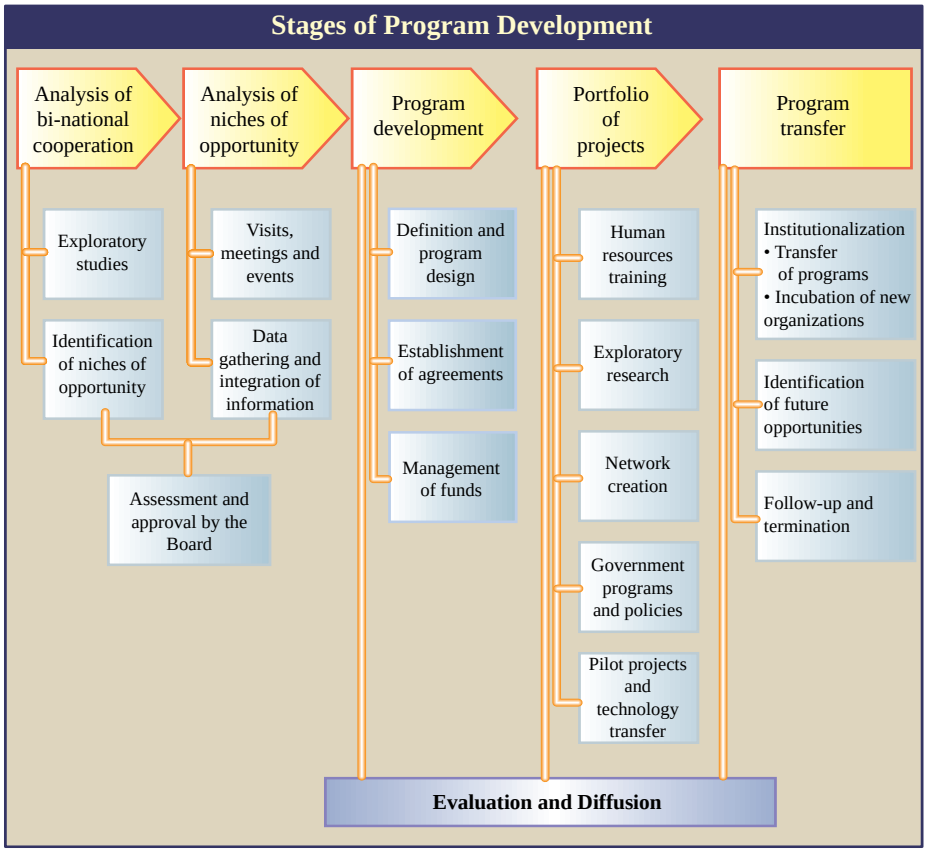
The programs at FUMEC build bi-national cooperation in areas of mutual interest to both countries such as: border issues, health, enviroment, security, labor and economic development. Science, technology and the development of specialized human resources are key factors to the success of these endeavors.

The Board of Governors periodically reviews the content and scope of its programs and decides which new opportunities to address, based on consultations with representatives of government, academic and business communities from both countries.

FUMEC has 3 programs in operation:

- Enviroment and Health
- Industrial Sustainable Development
- Enhancement of Human Resources in Science and Technology

Stages of program development



Measures of success

Institutional involvement
Financial resources multiplying capacity

Infrastructure development

- Human resources
- Science & Technology
- Institutions and business creation

Impact in terms of problem solution and new opportunities of collaboration

Description of Programs

A. Environment and Health

CONTEXT

Health and environmental problems don't recognize borders; regions and nations can collaborate to prevent and solve short and long term problems.

STRATEGY

FUMEC's strategy has been to select issues that are relevant to the border; in many cases, solutions have later been expanded to address nation-wide problems, particularly in relation to Mexico.

SUBPROGRAMS

1. Water and Health in the U.S.-Mexico Border
2. Environmental Health Network in the Border
3. Promotion of Bi-national Research in Migrant Health
4. Food Safety
5. Environmental Effects of Genetically Modified Crops
6. Air Quality in Large Cities
7. Contribution of Strategic Actions to Global Climate Change
8. Bi-national Collaboration in Flood Prevention Research

B. Industrial Sustainable Development

CONTEXT

The U.S. and Mexico can benefit from collaboration in industrial sustainable development to build competitive regional advantages, within the global marketplace.

Particularly, the U.S. – Mexico border acts as a laboratory of successful interactions in issues such as pollution prevention and bi-national regional development based in technology intensive activities, that can be replicated in other areas.

STRATEGY

FUMEC focuses on facilitating collaboration to build articulation mechanisms that create and strengthen innovative companies and regions:

- Mechanisms to develop technical and entrepreneurial skills of micro and small businesses in specific sectors.
- Networks and consortia to foster the inclusion of Mexico in advanced technological niches of bi-national importance.
- Strengthening regional systems to support the creation, attraction and development of technology based enterprises.
- Involvement of universities, industries and government institutions in developing clean production capacities.

SUBPROGRAMS

1. University-Industry Collaboration in Clean Production
2. Pollution Prevention and Modernization in Micro and Small Businesses
3. Cross-border Cooperation for Sustainable Industrial Development
4. Technology Based Economic Opportunities

C. Enhancement of Human Resources in Science and Technology

CONTEXT

The global movement towards the Knowledge Societies demands that nations prepare their people to "learn how to learn", to develop skills to think and act in a scientific manner, and to keep abreast of the increasing expansion of scientific and technological advancements.

The U.S. and Mexico recognize this trend as a key element to sustain their development in the context of the XXI Century.

STRATEGY

FUMEC has addressed the problem of life-long learning skills by promoting the involvement of educators, scientists, State and Federal governments, as well as businessmen, in setting up inquisitive science learning methods in Basic Education. INNOVEC is the institution created to promote this process.

The Foundation also develops comprehensive articulation programs to involve government, business and academic institutions (of all levels) in fostering skills to enter promising technological niches, such as the area of Micro-Electromechanical Systems.

FUMEC maintains, along with the Mexican Academy of Sciences, a program of visits and exchanges of specialists in topics related to its programs.

SUBPROGRAMS

1. Science in Basic Education
2. University-Industry Consortium to build Micro-Electromechanical Systems Capacity
3. Academic Exchanges

A. Health and Environment

Health and Environment

A.1 Water and Health in the U.S.-Mexico Border

Challenge

The upgrading of the technical, administrative and financial practices of water utilities in the Border area is an issue of concern for both countries, because of its implications in terms of water availability and potability. Potable water and water treatment operating efficiency is deficient partially due to a lack of training and technical assistance. Physical loss of potable water is around 40%. This is critical in terms of loss of the precious resource and speaks to the lack of consciousness for preservation.

Strategy

FUMEC has promoted the articulation of different groups of actors to:

- Create networks, such as the Training, Certification and Technical Assistance System (SCCAT), which are supported by Coordinator Groups that meet periodically to analyze the organization, legal and financial aspects of the SCCAT, thus ensuring continuity and permanence to the project.
- Develop training abilities in water utilities experts.
- Improve the operation efficiency of water treatment plants through Comprehensive Performance Evaluations.
- Educate for the safe and responsible use of water.

Sponsors

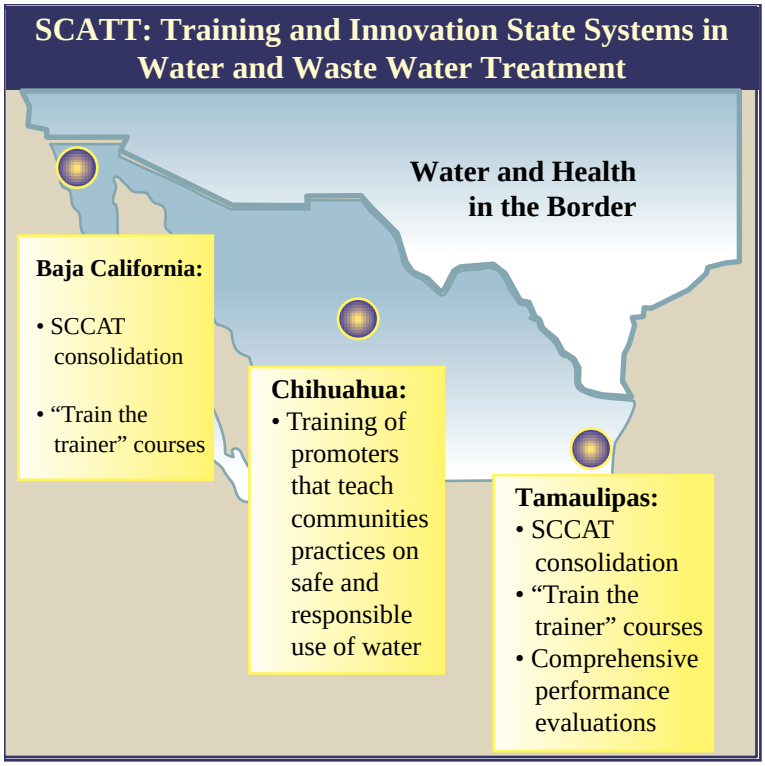
Environmental Protection Agency (EPA) and William and Flora Hewlett Foundation.

Program Partners

Autonomous University of Tamaulipas, CETYS-University, Labor Normalization and Certification Council, Tamaulipas and Baja California Border Water Utilities, CNA (National Commission of Water), Mexican Center of Training in Water and Sanitation, Frank M. Tejeda Center, Texas Engineering Extension Service, International Border and Water Commission, and the Border Environment Cooperation Commission.

Main Results

With contributions from the EPA and the William and Flora Hewlett Foundation, FUMEC promoted and facilitated the establishment of state systems for training and innovation in water and waste water treatment, involving water utilities, universities and research institutes in Tamaulipas and Baja California. These systems work closely with U.S. universities and organizations, such as the Tejeda Center of Texas A&M University in San Antonio.



Key actions and results:

- As part of the SCCAT Training System, the "Train the trainer" course has given pedagogic tools to water utilities specialists in Baja California and Tamaulipas.
- Certification processes for water utilities were linked to CONOCER (Labor Normalization and Certification Council).
- Comprehensive Performance Evaluations (CPE) were conducted for water utilities in Nuevo Laredo, Reynosa, Matamoros, and Tampico.
- Training programs for Ciudad Juarez promoters were established, to help communities that need training on water use and purification.

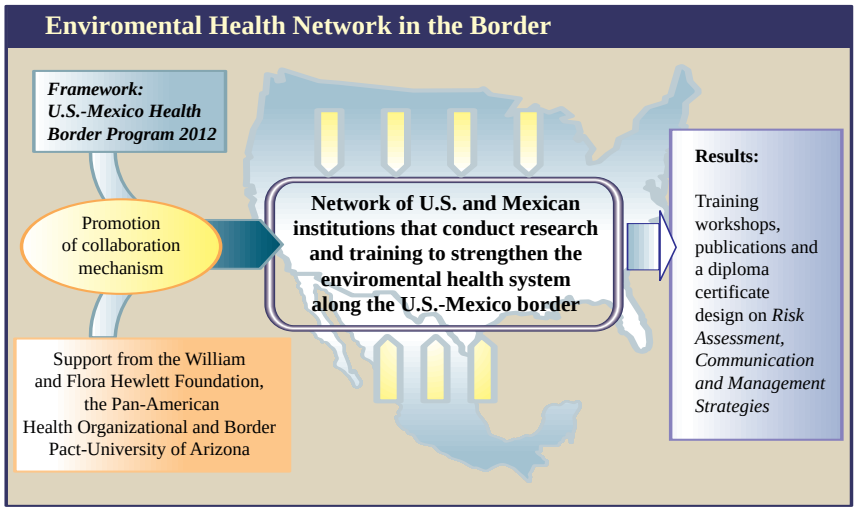
Perspectives

- Expand the scope of the program to other States (Sonora, Coahuila, and Nuevo Leon), involving institutions from both countries.
- Promote the use of CPE evaluation criteria as the basis for a Mexican Federal Norm.
- Additional resources have been awarded by the Environmental Protection Agency to strengthen the Border Network for Training and Technical Assistance to Water Utilities.
- Within the Bi-national Sustainability Laboratory initiative, FUMEC will contribute to build a bi-national agenda of research proposals and technology-based programs to improve water management along the border.

Health and Environment

A.2 Environmental Health Network in the Border

Challenge	Border communities face increasing risks related to environmental problems that can impact on public health. The health systems on both border regions need to be able to respond effectively to environment and health emergencies.
Strategy	Establish a bi-national research and education network that will seek to strengthen the environmental health system along the border, with the participation of higher education and research institutions, non-governmental organizations and government institutions.
Sponsors	William and Flora Hewlett Foundation, Pan-American Health Organization and Border Pact-University of Arizona.
Program Partners	COFEPRIS (Federal Commission for Sanitary Risk Protection), SEMARNAT (Environment and Natural Resources Ministry), EPA (Environmental Protection Agency), ATSDR (Agency for Toxic Substances and Disease Registry), INSP (National Institute of Public Health) and PAHO (Pan American Health Organization).
Main Results	***FUMEC helped to structure a network of U.S. and Mexican academic, government and non-government institutions that are organizing several programs to train specialists and conduct research on environmental health issues.***



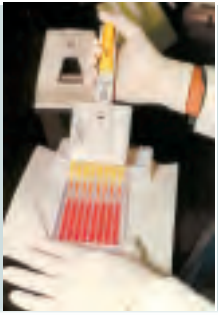
Key actions and results:

- Environmental Health and Certificate Proposal, presented during the "2012 Border" meeting, supported by SEMARNAT and EPA.
- Virtual risk communication course.*
- Environmental Health Risk Communication, Management and Assessment workshops.

* The developers of the course material are representatives from FUMEC, ASTDR, OPS/Brazil, CEPIS/OPS, Veracruz Health Services/Mexico, National Sanitary Vigilance Agency/Brazil, National Institute of Hygiene and Tropical Medicine "Leopoldo Izquieta Perez"/Quito, Water and Sanitation Program, and World Bank/Lima, Peru.

Perspectives

- Set up a training program and a Border environmental information management system which will include environmental health indicators, with support of SEMARNAT, ATSDR and PAHO.
- Identify the main environmental health issues at the border area.
- Promote improved environmental health policies and actions.



A.3 Promotion of Bi-national Migrant Health Research

Challenge

The continuous flow of people between U.S. and Mexico represents a challenge to both countries in terms of health-related issues. The main areas of concern in migrant health are AIDS, sexually transmitted diseases, drug addiction, alcoholism, mental health, family violence, and oral health.

Strategy

FUMEC has been working with higher education institutions, governmental agencies and NGO's at the border areas, to strengthen the response capacity to migrant health problems through the establishment of research priority agendas, and the promotion of training programs related to emergent, infectious and transmissible diseases among migrants. The expected outcomes of these efforts will result in: better quality and opportunity in medical care; diagnosis and prevention of transmittable diseases; health education; health insurance for migrants, and epidemiological surveillance.

Sponsors

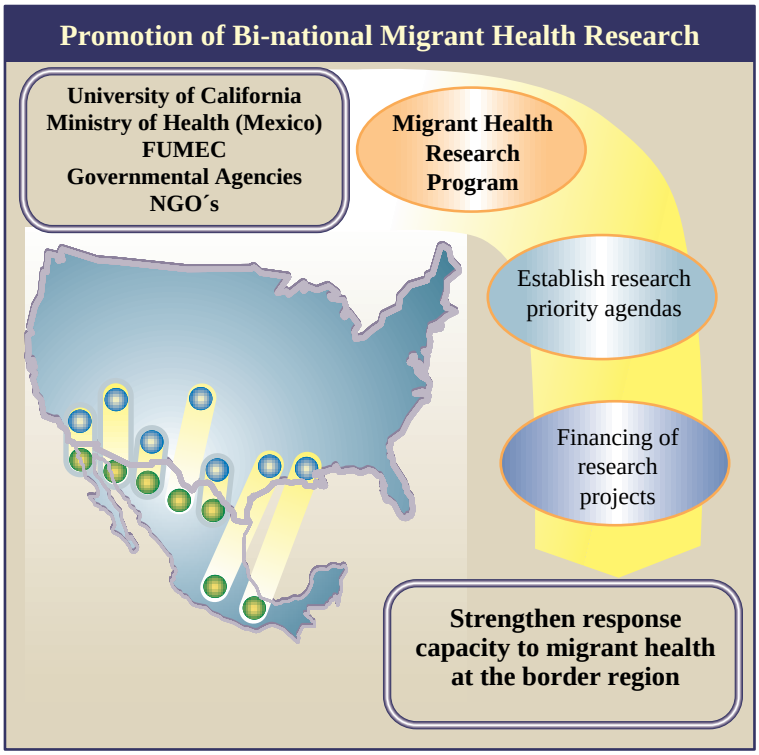
United States-Mexico Foundation for Science

Program Partners

University of California, University of Texas, California Program on Access to Care of the California Policy Research Center, Paisano Program, California Endowment, U.S. Department of Health and Human Services, Mexican Ministry of Health, National Institute of Migration, Ministry of Foreign Relations, California-Mexico Health Initiative, CONACYT, and Partnership for Prosperity.

Main Results

The migrant health initiatives of the Foundation crystallized in a program with the Mexican Ministry of Health and the University of California, which organizes calls for proposals and finances bi-national research projects.



Key actions and results:

- Exploration of research & training agendas in collaboration with Mexican and U.S. universities, as well as NGO's along the border.
- Support to six research projects of the Migrant Health Research Program (California-Mexico) in the following subjects: AIDS, woman health, mental health, health services and health-disease determining aspects.
- A second call for proposals of the Migrant Health Research Program has been launched to conduct research projects on migration and health in Mexico and California.

Perspectives

- Promote additional research and training programs, with the support of the University of California and Mexican institutions, to strengthen services related to migrant health.
- Involve academic institutions from the states of Texas, Chihuahua, Nuevo Leon and Tamaulipas, as well as from non-border Mexican states with high migrant mobility, to define a research agenda that will clarify the main health problems present in these regions.

A.4 Food Safety

Challenge

There are new techniques and procedures that can make food safety practices more effective and simple. Farmers and producers that participate in the bi-national food chain need to introduce them to smooth sanitary – commercial systems. The impact is directly related to less infectious intestinal diseases (which are the main cause of death in preschool children and the fourth cause of death in infants in Mexico), and compliance to new food safety regulations in the U.S. that seek to decrease food-borne diseases related to presence of pesticide residues, physical residues or bacteria.

Strategy

FUMEC promotes the articulation of groups from both countries, such as technicians from private and public organizations of more than ten states of Mexico (in charge of food products certification), academic institutions, producers, farmers and laboratories, to develop research, training and promotion of food safety techniques. This program also seeks the improvement of technical-entrepreneurial skills in farmers and producers, to contribute to a smooth integration of the bi-national food chain.

Sponsors

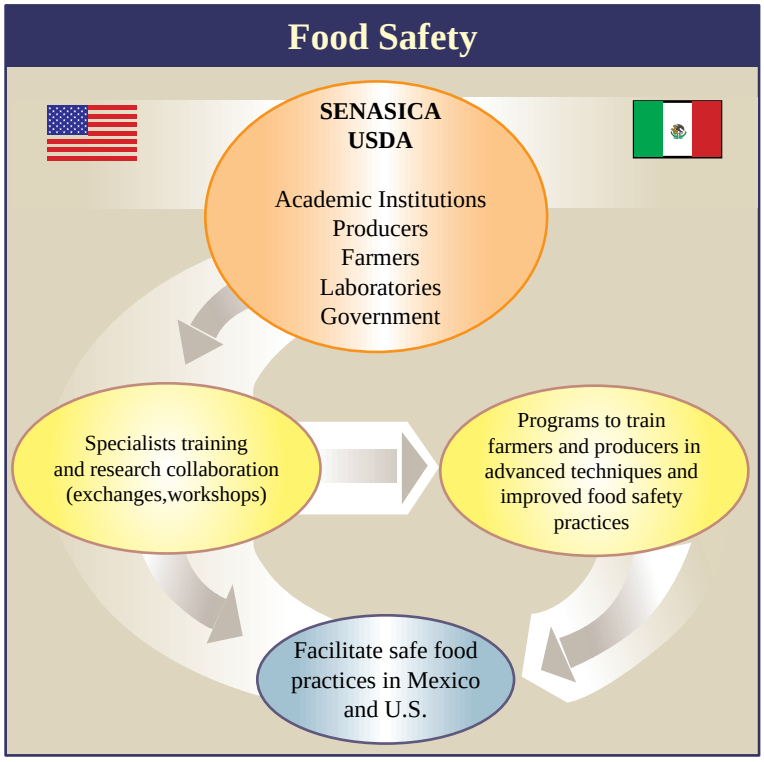
United States-Mexico Foundation for Science

Program Partners

United States Department of Agriculture-ARS, Food and Drug Administration, National Service for Sanity, Quality and Food Safety-Agriculture, SENASICA-SAGARPA, Ministry of Health, INIFAP (National Institute of Forestry, Agricultural and Animal Research), University of Arkansas, Research Center in Food and Development, Mid America International Agricultural Consortium, Northwest Consortium of Mexico, University of Texas A&M, Food and Agriculture Organization, and Colegio de Postgraduados (Postgraduate College).

Main Results

With the support of SENASICA and the U.S. Department of Agriculture, FUMEC has facilitated the interaction between academic institutions from both countries and food chain-related organizations, to help farmers and producers to introduce new food safety practices that result in smoother buying – selling processes, and in increased capacity to comply with food safety regulations.



Key actions and results:

- 2002 bi-national workshop on advanced techniques to detect pathogen microorganisms in fruits and vegetables.
- Dissemination of information to researchers and producers on new U.S. regulations on food commerce.
- First Bi-national Symposium on Food Safety Research (February, 2003) at INIFAP, which identified research projects on pathogens detection, as well as fruit and vegetables treatment for export and national markets.
- Scholarships granted to two Mexican scientists to attend an International Workshop on Numeric Methods and Ecotoxicology*.
- Second International Workshop on Pathogens Diagnosis in Meat using PCR in Real Time.
- Support to the design of a Masters Program on Food Safety and Quality (Colegio de Postgraduados).

* The workshop was conducted by Texas A&M University, the Environmental Chemistry and Biology Research Institute from Spain, and the Aveiro University of Portugal. It was organized by the Mazatlan Research Center for Food & Development and the Ocean & Limnology Science Center of Mazatlan.

Perspectives

- Involve U.S. and Mexican institutions in the development of a training and research agenda.
- Establish a Technological and Entrepreneurial Assistance System (SATE) to support small food processing companies.
- Implement a bi-national consortium on food safety.

A.5 Environmental Effects of Genetically Modified Crops

Challenge

Mexico contains a treasure trove of diversity in maize: 59 races, each with a large number of sub-varieties. When researchers claimed genes from genetically modified corn appeared in native Mexican maize, Mexican scientists, politicians and farmers feared for the genetic richness of their native maize. The use of genetically modified crops has the potential of producing more and better quality food. Nevertheless, we must analyze whether there is a threat to biological diversity, particularly in centers of origin and diversification of genetically modified crops. Therefore, it is crucial to promote bi-national cooperation in science, technology and education related to the effects in food safety and in biodiversity due to the gene flow from transgenic crops.

Strategy

FUMEC has promoted interchange between researchers, policymakers, industry and representatives of the media to discuss the current situation and body of knowledge concerning the potential ecological and socioeconomic effects of gene flow of genetically modified maize on the native species of Mexico. It has also increased awareness of this issue among the general public and leading decision makers; these actions have served as a basis to establish an agenda of research and technology development projects.

Sponsors

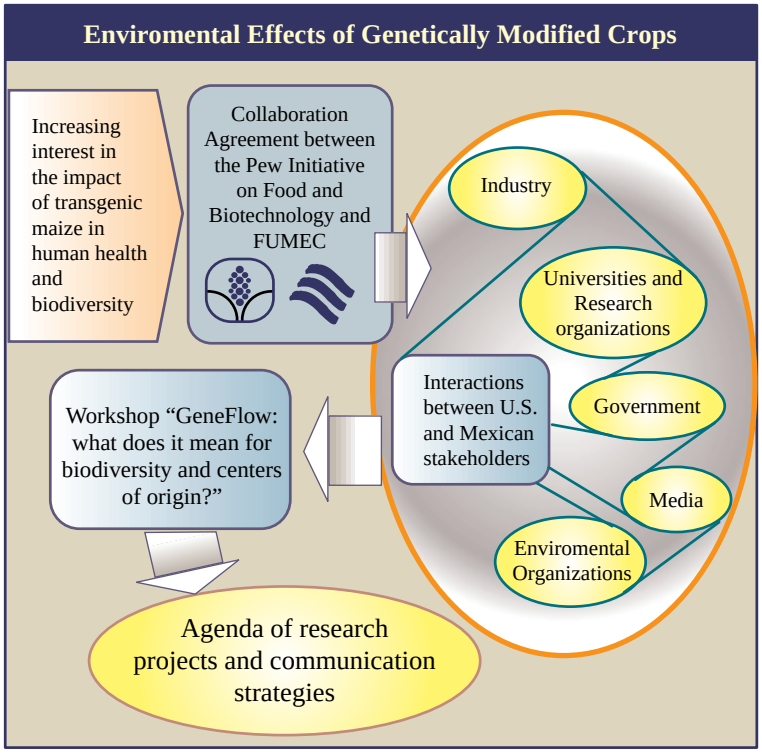
Pew Initiative on Food and Biotechnology

Program Partners

Agriculture, Poultry, Rural Developing, Fishing and Food Ministry, Inter-Secretarial Commission on Bio-Security and Genetically Modified Organisms, United States Department of Agriculture, National Commission on Biodiversity Knowledge and Use, Ministry of Environmental and Natural Resources, National Institute of Ecology, CONACYT, Mexican Academy of Sciences and U.S. National Academy of Sciences.

Main Results

FUMEC collaborated with the Pew Initiative on Food and Biotechnology and Mexican authorities to articulate research and academic institutions from U.S. and Mexico with key stakeholders, in order to establish a bi-national research agenda to analyze the impact of gene flow in biodiversity and human health.



Key actions and instruments:

- 2003 Workshop "Gene Flow: what does it mean for biodiversity and centers of origin?" More than 200 people attended which included scientists, students, representatives from the U.S. and Mexican Governments, industry, media, as well as environmental and civil society representatives.
- Integration of a bi-national research agenda.

Perspectives

A second international workshop will be organized in 2004, to provide follow up on the research agenda and to establish additional mechanisms to foster bi-national collaboration.

A.6 Air Quality in Large Cities

Challenge

Urban concentrations represent serious challenges in terms of air pollution and energy consumption. The case of Mexico City is important, since measures adopted by government and other agencies that prove successful in this mega city, can serve as an example to other urban areas world-wide. Policies have to be scientifically and technologically based and networks have to be developed to conduct research, exchange experiences, and contribute to the difussion of the most successful practices for issues such as urban development, public transport structure, land use and urban mobility.

Strategy

Under the initiative of Dr. Mario J. Molina, a bi-national network was created to analyze air quality problems in large cities from a scientific & technological perspective, and to suggest guidelines for the establishment of new public policies and programs. As part of this network, a Bi-national Research Group was created with the participation of U.S. and Mexican researchers to analyze and provide plans of action and policies on air quality in Mexico City. Additional research projects were conducted through a network supported by CONACYT and FUMEC, which focused on specific issues related to air quality in border cities and analysis of priority problems such as public transport.
These efforts will be consolidated through the creation of the Energy and Environment Center in Mexico that will have an international focus.

Sponsors

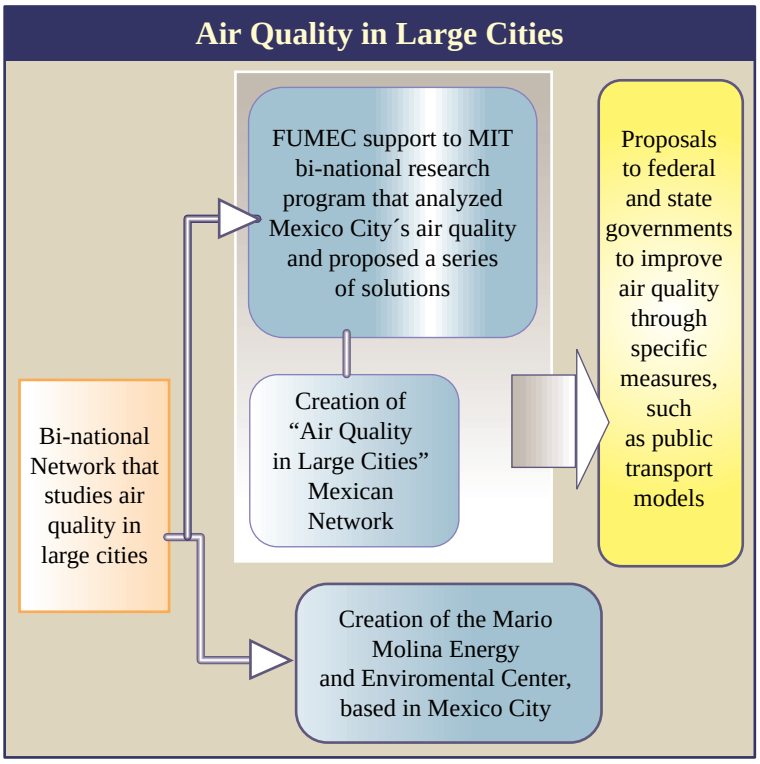
Massachusetts Institute of Technology, William and Flora Hewlett Foundation, North American Commission on Environmental Cooperation and Metropolitan Environmental Commission.

Program Partners

Network affiliates (coordinated by El Colegio de México): Ministry of Environmental and Natural Resources, Environmental Department of the Mexico City Government, State of Mexico's Ecology Department, Presencia Ciudadana (Citizen Presence), Centro Mexicano de Derecho Ambiental (Mexican Center for Environmental Rights) and Centro de Transporte Sustentable (Sustainable Transportation Center).

Main Results

The "Air Quality in Large Cities" initiative, led by Dr. Mario Molina (that FUMEC contributed to support), evolved into the creation of the Energy and Environment Center, which will start operations in 2004.



Key actions and results:

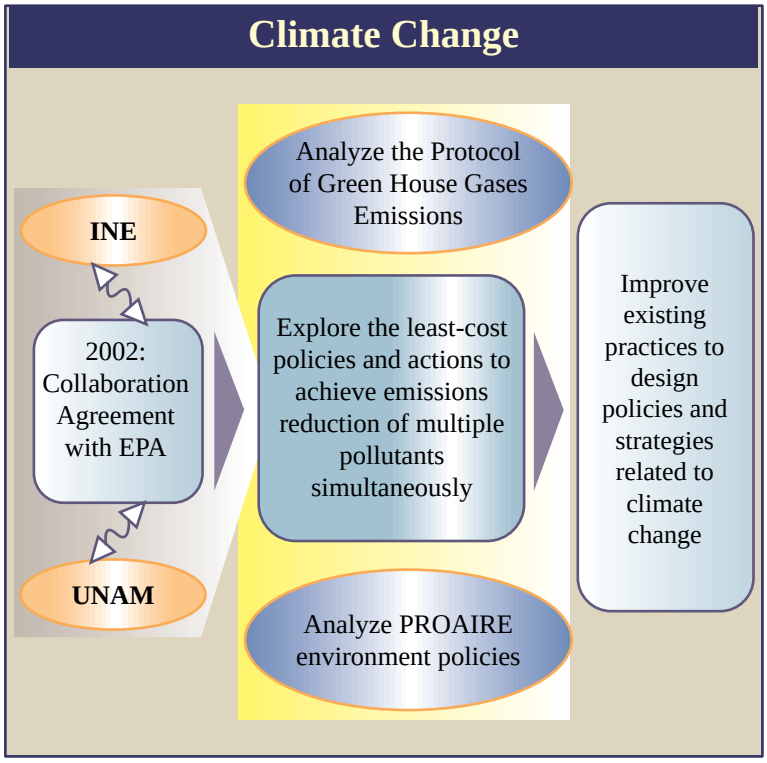
CONACYT and FUMEC have supported the Air Quality Research Network, which has focused on the establishment of communication bridges between the academic community and decision-makers. It has organized debates on scientific, economic, educational, political and social issues that affect air quality, and promoted solutions in areas such as implementing change in air quality management, and transport configuration.

Perspectives

A continuation of this subprogram is the creation of the Mario Molina Energy and Environment Center in Mexico, with initial support from the Hewlett Foundation. The goal of this new Institute is to carry out interdisciplinary research to assess complex environmental problems, and to develop sustainable options to meet the demand for energy in the developing world. The initial research focus areas are: a) Transportation and Land Use Planning for Air Quality Improvement, b) Power Generation and c) Air Quality and Climate Change.

A.7 Contribution to Strategic Actions in Global Climate Change

Challenge	Climate change is one of the most important and complex challenges of the XXI century. Human activities are increasing the concentrations of green house gases -that tend to heat the atmosphere- and continue to produce pollutants such as aerosols that damage the ozone layer, therefore, contributing to changes in regional and global climates. Specific research and policy-making goals have to be addressed in different regions.
Strategy	FUMEC has contributed, as a project manager, to an initiative of the Environmental Protection Agency to facilitate collaborative research to provide the Government of Mexico with a broad base of information that can help in improving existing practices and to design policies and strategies related to climate change. Specific issues that are being addressed are: Inventory Improvement, Policy Analysis, Industry Performance and Land Use-Land Use Change Forestry. Special emphasis has been dedicated to border global climate related issues.
Sponsors	Environmental Protection Agency
Program Partners	INE (National Institute of Ecology), National Autonomous University of Mexico.
Main Results	***FUMEC facilitated the interactions between U.S. and Mexican institutions to integrate an agenda of research projects, which will provide policy makers from both countries with valuable information to achieve emission reductions that impact on climate change.***



Key actions and results:

- Integration and development of a research agenda on least-cost policies and actions to achieve emissions reduction.
- Discussion of results between project specialists and government agencies. (The final report is available at INE and EPA Web pages).
- Presentation of results in different publications* and forums.
  "Implications of Global Climate Change for International Security Workshop", held at Sandia Laboratories.
  "1st Latin American and the Caribbean Workshop", held in AIACC, Costa Rica.

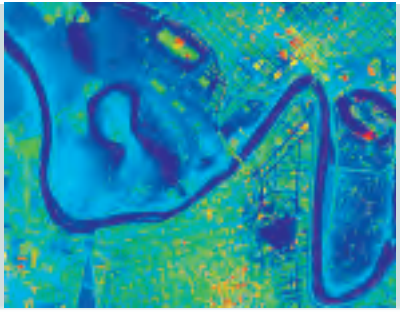
* Publications.

- Publication at the World Resources Review: "Climate Change and Human Health: Education, Information and Communication". Vol. 15 No. 3, September 2003.
- Contribution to the elaboration of the book "Climate Change and Human Health: Risks and Responses", World Health Organization, 2003.
- Contribution to the elaboration of the book "Methods of Assessing Human Health Vulnerability and Public Health Adaptation to Climate Change", World Health Organization, 2003.

Perspectives

Promote bi-national collaboration to:

- Follow up on research results to create a Protocol of Green House Gases Emissions that Mexican industries should comply with.
- Continue the exploration of the least-cost set of policies and actions for achieving emissions reduction of multiple pollutants simultaneously, to address more general questions on the relationship between urban air pollution control and Green House Gases (GHG).
- Design and implement a Geographical Information System (GIS) and an Internet MAP server, based on information from the updated national GHG emission inventory for the LULUCF sector.



A.8 Bi-national Collaboration in Flood Prevention Research

Challenge

Disaster prevention and management requires the collaboration of both countries, especially at the border region. A case in point is the Matamoros/Brownsville zone that confronts a serious flooding problem, affecting the social and economic life of the region. Research can help in analyzing the problem through flood hazard modeling, setting up the bases for regional emergency and long term response policies.

Strategy

As a result of a joint initiative between NASA and FUMEC, and in collaboration with regional authorities, a program was established to facilitate scientific and technological exchange and the promotion of networks that can help border communities to establish effective disaster management systems.

Sponsors

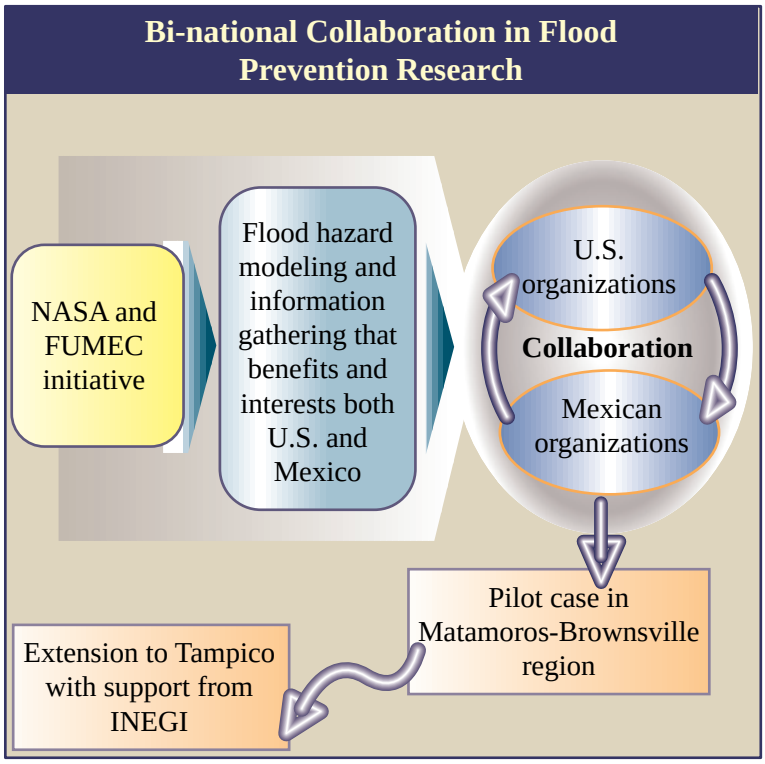
United States-Mexico Foundation for Science

Program Partners

National Aeronautics and Space Administration, University of Texas at Austin-Center for Space Research and Bureau of Economic Geology, University of Tamaulipas (UAT), INEGI (National Institute of Data Processing, Geography and Statistics), National Center for Disaster Prevention, and U.S. Geological Survey.

Main Results

FUMEC promoted the establishment of agreements between organizations from the U.S. and Mexico to conduct research and expert interchange in relation to flood hazard modeling, and to integrate an information gathering system of interest to both countries. The experience of the Matamoros-Brownsville region will be useful to other regions that need to establish similar programs.



Key actions and results:

- Capacity development to use LIDAR systems in Matamoros to scan the land with laser rays and generate digital elevation models to be used in flood prevention programs
- Capacity building in key Mexican institutions like INEGI, UAT and UNAM, in collaboration with U.S. organizations.
- Promotion of the use of LIDAR systems in other cities with flooding and natural disasters problems.

Perspectives

- The LIDAR system will be incorporated to the UNAM's Geography Institute software models in 2004, to be applied in the study of disasters of other regions.
- Flood prevention models will be applied in other regions of Mexico.

B. Sustainable Industrial Development

Sustainable Industrial Development

B.1 University-Industry Collaboration in Clean Production

Challenge

Border communities have great interest in diminishing industrial pollution and protecting the environment. On the Mexican side, there are 2,000 maquiladora plants (although only a fraction of them involve chemical transformations), which generate waste products such as oils & grease, solvents, plastics, solder and ink. There is also the presence of small and medium sized industries with poor clean production practices.

Strategy

Working in close relationship with the Pollution Prevention Roundtables in the U.S., Canada and Mexico, the Foundation has collaborated with Mexican industrial representatives, government agencies, private consultants and universities, in setting up workshops and regional roundtables along the border. This collaboration has included: successful case studies, searching for best practices, training industry specialists, evaluating impact of cleaner production practices and reviewing policies to promote clean industries along the border.

Sponsors

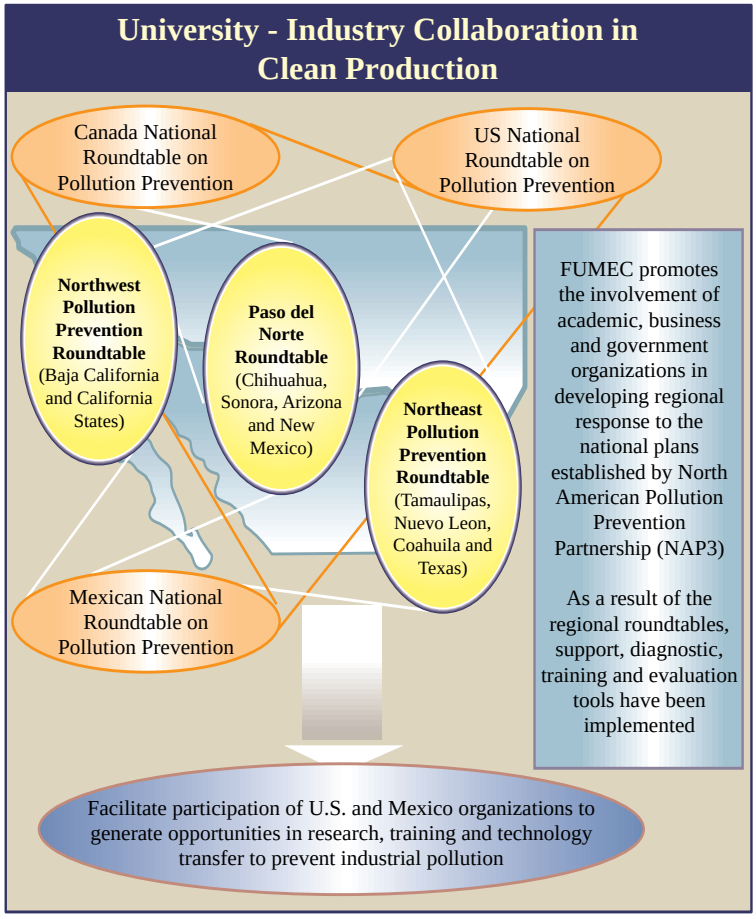
U.S. Environmental Protection Agency, North American Commission on Environmental Cooperation.

Program Partners

Texas Commission on Environmental Quality, Lexington Group, National Chamber of the Transformation Industry, Autonomous University of Ciudad Juarez, North America Development Bank, Border Environmental Cooperation Commission, Fund for Pollution Prevention (FIPREV/FUNTEC), Attorney General for Environmental Protection, Center on Research and Environmental Studies (NGO located in Nogales, Sonora), WERC (New Mexico Universities Consortium).

Main Results

FUMEC facilitated the organization of three bi-national roundtables in different parts of the Border, which are now linked to the Pollution Prevention Roundtables from U.S., Canada and Mexico. These roundtables integrate the participation of industry, government and academia in technology transfer programs to diminish industrial pollution in terms of hazardous and non hazardous waste generation, air emissions and wastewater discharges.



Key actions and results:

- Diagnostic studies
  - Environmental performance of typical manufacturing activities in Ciudad Juarez.
  - Data base on border industries environmental performance included in the Annual Operation Certificate (COA) to improve air quality, waste handling, border waste water pre-treatment and treatment.
- Workshops on:
  - Waste water pretreatment and composting.
  - Environmental management systems.
- Regional roundtables
- Participation in the 4th National Roundtable.
- Long distance learning program on cleaner production.

Perspectives

- Development of border-wide bi-national industry/government enviromental performance partnership efforts.
- Evaluation of green house gas generation by border industries.
- Consolidation of the Regional Pollution Prevention Roundtables recently established at the border, linked to the three National P2 Roundtables (U.S., Mexico and Canada) through the North American P2 Partnership (NAP3).
- Explore opportunities on "recycling business parks".

B.2 Technological Innovation and Pollution Prevention in Micro and Small Firms (SATE)

Challenge

Micro and small firms can play a significant role in technology and high value clusters. To unlock the potential of many small firms it is necessary to foster the development of technological and entrepreneurial skills, within an ecological culture.

Strategy

SATE design was based on the Pennsylvania Technical Assistance Program and the Industrial Research Assistance Program of Canada. SATE is:

- A linking program. Instead of providing specific services, it links support services with the firms that require those services.
- Focused on specific sectors. It started in automotive repair and machine shops and is expanding to other sectors.
- Based on experienced–entrepreneurial advisors (ATEs).
- Oriented to high potential firms.
- Measured in terms of growth and profit of the firms, as well as in the development of organizations that provide services.

SATE is operating in Chihuahua, Tamaulipas, Nuevo Leon and Veracruz, and is also assisting Paso del Norte SME's (small and medium sized enterprises).

Sponsors

Mexican Ministry of Economy, State Ministries of Economic Development from the States of Tamaulipas, Nuevo Leon, Chihuahua and Veracruz, Machine and Automotive Associations and National Chamber of the Transformation Industry.

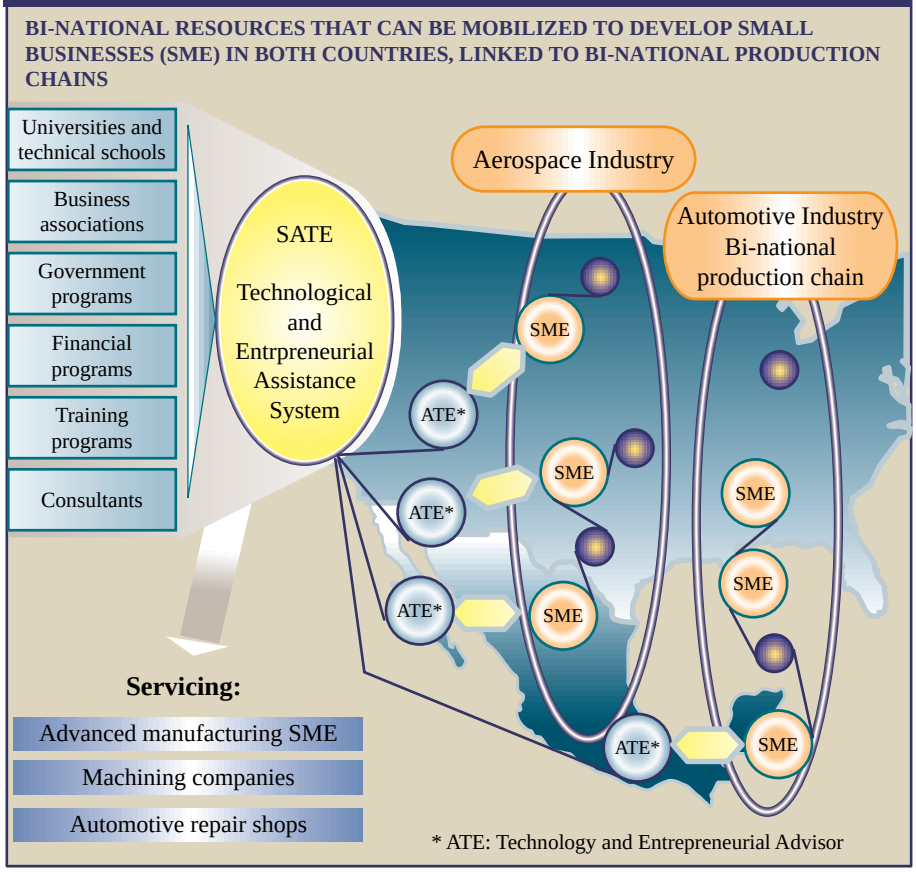
Program Partners

University of Texas at El Paso, Pennsylvania Technical Assistance Program, Ciudad Juarez Technological Institute, High-Tech Training Center, Advanced Materials Research Center, Center for the Development of Entrepreneurial Competitiveness, Veracruz Sate Council of Environmental Protection, Consumers Federal Attorney, Training Center for Industrial Work and Ministry of Environmental and Natural Resources.

Main Results

The SATE Program, which started as a technological – entrepreneurial support system for automotive repair shops, has evolved into bi-national resource networks that help SME's on both countries, to integrate themselves into bi-national production chains.

Technological and Entrepreneurial Assistance System



The SATE model can be integrated to other assistance programs at a very low cost, creating added value in terms of: coordination of service providers to assist SME's from specific sectors; emphasis on supporting enterprises with high potential, and feedback on the relevance and adequacy of service programs to the needs of companies.

Key actions and results:

- Assistance to 50 machine shops in Chihuahua and Tamaulipas within a joint program with New Mexico and Texas.
- Articulation with resources in Brownsville and McAllen through the University of Texas and community colleges.
- "2010 Auto Repair Shop" project. A model for automotive repair shops in order to provide now the service that will be a standard in 2010.
- Assistance to more than 600 automotive repair shops.
- Support on ISO-9000 certification for machine shops.
- Technical support on pollution prevention.
- Pilot Network of Technical Assistance with technical schools in Nuevo Leon, Tamaulipas and Veracruz.

New markets for SME's

Small businesses in Chihuahua, Nuevo Leon, Tamaulipas, Texas and New Mexico have new markets in the maquiladoras and in complex manufacturing U.S. markets.

Supplier Development

SATE is helping small machine shops to become suppliers of manufacturing companies such as Delphi, Honeywell, Thomson, Scientific Atlanta, Stratec, Toro Company and Aplicadores Mexicanos.

Perspectives

- Consolidation of present SATE programs through more government and industry involvement.
- Promotion of SATE programs in strategic technology areas such as Software, Food Safety, Biomedicine, Electrical Sector, Cyber-security.

B. 3 Cross-Border Collaboration for Industrial Sustainable Development

Challenge

Border states are increasing their collaboration in fostering regional bi-national development. A key factor is to incorporate in their economies higher value added industrial and service capacities.
The programs launched in these states can serve as a paradigm of how bi-national collaboration in technological areas can increase U.S. – Mexico regional competitive advantages.

Strategy

- The Foundation focused its efforts during 2002 and 2003 in facilitating awareness and collaboration in order to develop key actions that can facilitate the development of bi-national technology based clusters, specifically in the Paso del Norte region (Advanced Manufacturing, MEMS - Micro-Electromechanical Systems).
  FUMEC has supported the efforts of Sandia National Laboratories, CONACYT and Border States, especially in the Paso del Norte region, to create the Bi-national Sustainability Laboratory.
- These efforts have expanded its impact to other regions, as in the case of the strategies to develop MEMS capabilities in Mexico.

Sponsors

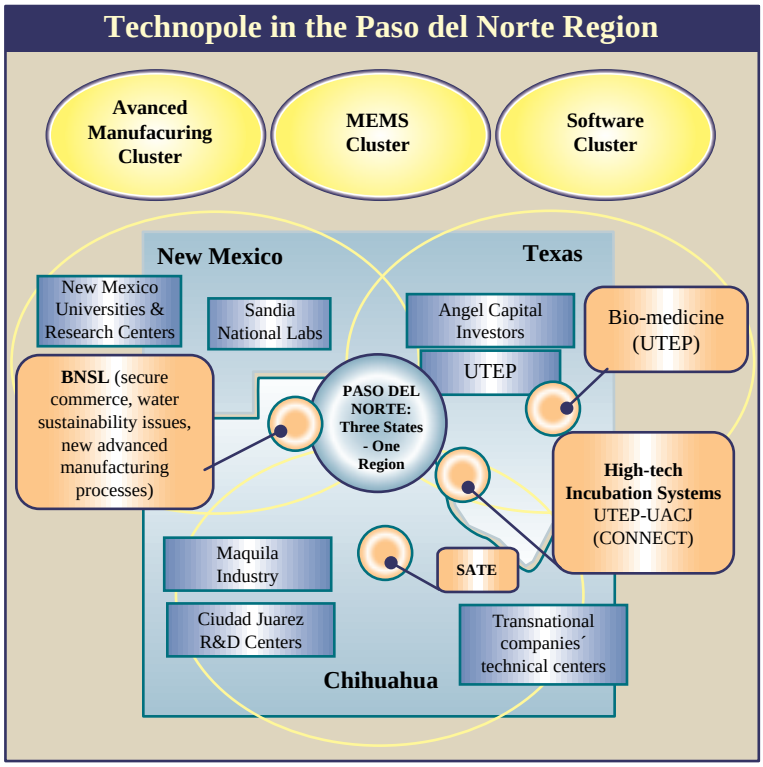
Mexican Ministry of Economy, CONACYT, and Department of Commerce-Economic Development Administration.

Program Partners

Sandia National Laboratories, University of Texas-Arlington, University of Texas- El Paso, University of New Mexico and University of Colorado-Boulder, Community College of Albuquerque, State Governments and Congressional Representatives.

Main Results

FUMEC has collaborated with government, academic and industrial organizations from both countries to develop clusters in Advanced Manufacturing, Micro-Electromechanical Systems and Software, that are contributing to strengthen bi-national production chains and regional competitive advantages.



Key actions and results:

2002-2003 results:

1) MEMS Cluster

- Creation of MEMS design centers in UACJ and UTEP.
- Investment in MEMS packaging in the region: (Delphi, UTEP, New Mexico MEMS facilities in Santa Teresa with support from Sandia National Laboratories).

2) Advanced Manufacturing and Software Clusters

- Presence of SATE programs for advanced manufacturing and machining shops.

3) High-tech incubation systems

- New high-tech business incubation capacities in UTEP and UACJ.

4) Bi-national Sustainability Laboratory (BNSL)

- The BNSL will address border problems and foster regional economic development. It will start pilot projects in 2004 with support of CONACYT, New Mexico State Government and the U.S. Economic Development Administration.
- Promotion of training programs in science and technology policies related to regional development

Perspectives

- Consolidation of present regional efforts by promoting its integration to bi-national production chains and fostering articulation with other U.S. innovation regions such as Silicon Valley, San Diego and Philadelphia.

Sustainable Industrial Development

B.4 Technology Based Economic Opportunities

Challenge

Countries and regions are competing in their capacity to build adequate policies, net - works and support mechanisms to foster the creation and strengthening of businesses and production chains in new strategic knowledge based economic sectors.

Strategy

FUMEC has been working closely with organizations in Mexico and the U.S. to develop mechanisms that can strengthen Mexican capacities in leading edge technologies, such as MEMS (Micro-Electromechanical Systems).
The Foundation is also promoting bi-national collaboration to foster regional innovation systems, that can accelerate the creation and strengthening of technology based enterprises.

Sponsors

Mexican Ministry of Economy, CONACYT and National Science Foundation.

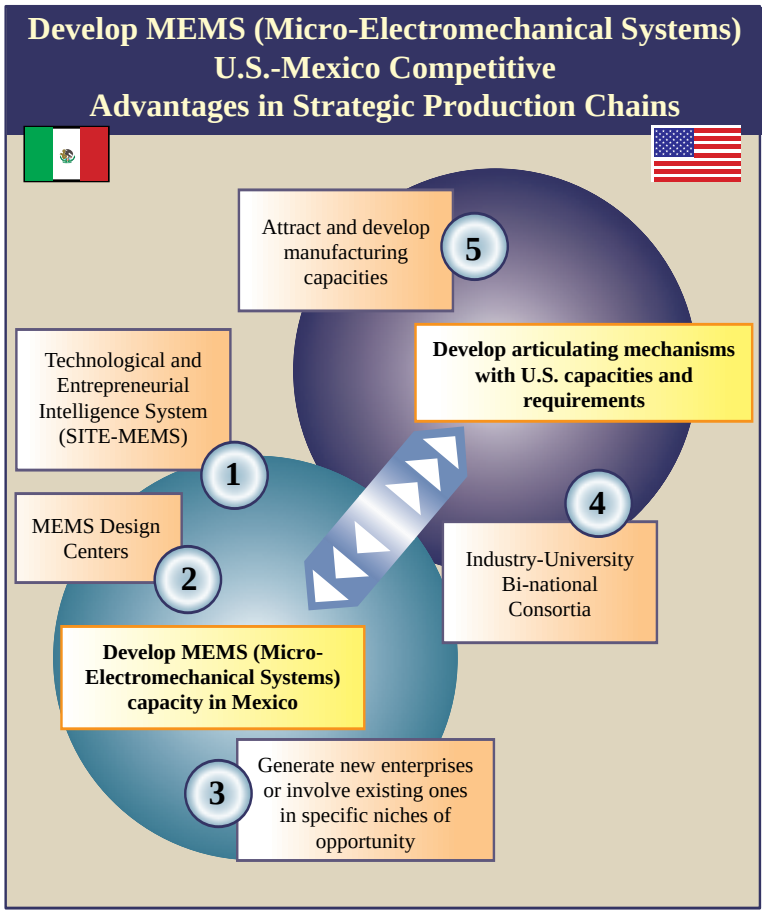
Program Partners

Sandia National Laboratories, Autonomous University of Ciudad Juarez, Autonomous Mexican National University, Guadalajara University, Cinvestav-Guadalajara, Veracruz University, University of Texas at Arlington, University of New Mexico, Electrical Research Institute, the Ministry of Economy, Chihuahua, Monterrey and Guadalajara Governments, CONACYT, Control Accessories S.A., MEMScAP Inc, Coventor, Ardesta, Honeywell, Delphi Technical Center, University of Texas at El Paso, Micro and Nanotechnology Commercialization Education Foundation, ITESM, Astrophysics, Optic and Electronic National Institute, Popular Autonomous University of Puebla State and Higher Technological Institute of Irapuato.

Main Results

a) Developing MEMS capacity in Paso del Norte and several Mexican Regions

The Foundation has promoted MEMS capacity building in Mexico and strategic contacts in the U.S., to develop a competitive bi-national infrastructure to maintain jobs and strategic advantages related to these technologies in the region, in areas such as MEMS packaging, automotive applications, telecommunications, electric sector applications and biomedicine.



The opportunity:

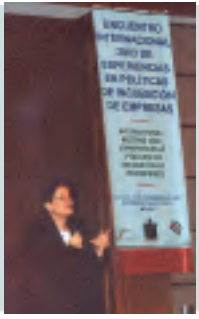
- The MEMS market, which is growing worldwide (it reached over 20 billion dollars in 2002), can boost knowledge based economic capacities along bi-national chains of production.

Key actions and results:

1. With support of the Ministry of Economy, FUMEC coordinated the integration of the SITE-MEMS (MEMS Technology and Entrepreneurial Intelligence System) which focused its initial search for opportunities in the areas of Packaging, Biomedicine, Electrical Sector, and Telecommunications.
2. With FUMEC support, 10 MEMS Design Centers started operations in several research centers and universities in Mexico, using seed resources provided by the Ministry of Economy and access to specialized support from Sandia National Laboratories. They also participated in a MEMS Specialization Program, which in turn has promoted the creation of new academic and research programs.
3. FUMEC organized several events to promote investment in MEMS packaging, especially at the Paso del Norte region.
4. The Ministry of Economy, CONACYT and State Governments are working in strategies to foster new MEMS enterprises and support the emergence of clusters in several regions.

Perspectives

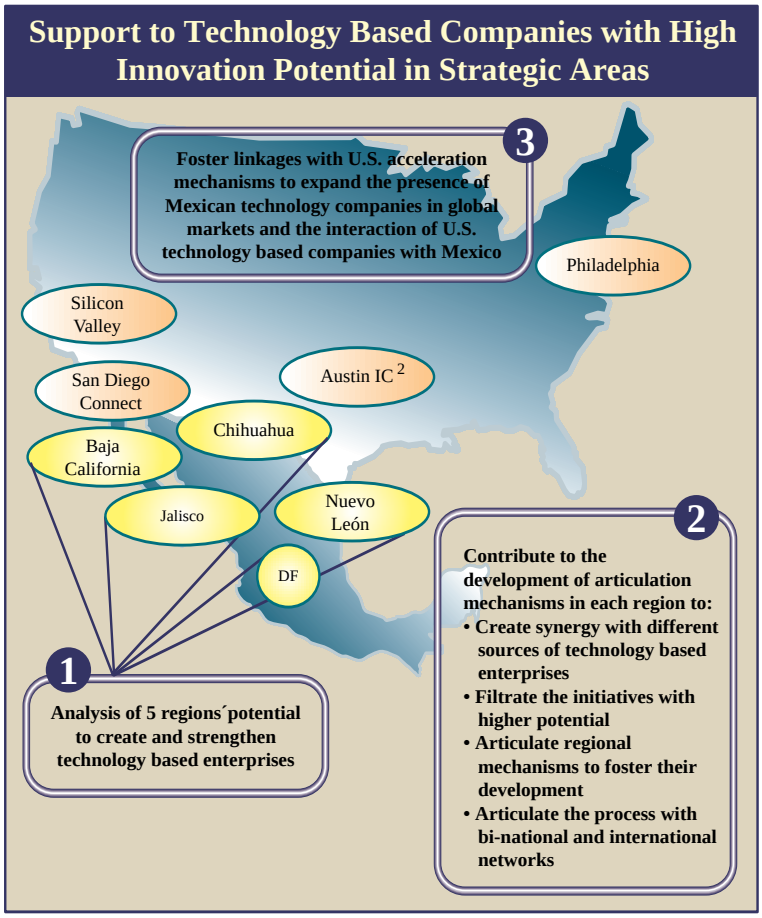
- FUMEC will continue to promote bi-national collaboration in MEMS capacity building in order bring Mexico into the international arena, in close relationship with U.S. partners.



Main Results

b) Regional networks and incubation systems for technology based companies

The Foundation has worked closely with the Ministry of Economy in analyzing strategies and facilitating interactions to incubate and accelerate the growth of technology based companies in Mexican regions with high potential. It has also promoted linkages with U.S. support systems for technology companies, in order to create synergies in strategic sectors such as MEMS, Advanced Software and Biotechnology.



Key actions and results:

FUMEC has collaborated with the Ministry of Economy to facilitate interactions between U.S. and Mexican incubation systems for technology based companies. The main actions have been the following:

1. Analysis of the potential for technology based businesses in 5 different regions.
2. Interaction with regional and nation wide networks linking government, business, venture capital and academia.
3. Strategic linkages with mechanisms in the U.S. such as Global Connect, Connect-San Diego and Philadelphia, the Council on Competitiveness, Silicon Valley organizations and Austin IC [2].

Perspectives

- FUMEC will continue to promote the connection of Mexican incubation and acceleration processes with U.S. innovation regions in order to build bi-national partnerships. A U.S.-Mexico Center for Technology and Innovation is being considered in the Silicon Valley.

C. Enhancement of Human Resources in Science and Technology

Enhancement of Human Resources in Science and Technology

C.1 Science in Basic Education

Challenge

Given the critical and increasing role of science and technology in sustainable development and economic growth, the Foundation has emphasized science and technology education as a key factor for innovation and competitiveness. One of its main concerns has been the use of Hands-On Inquiry Centered Science Systems in basic education, with the support of business, academia and government sectors in both countries.

Strategy

FUMEC has worked on several lines of action that include:

- Organization of bi-national events and training programs, as well as collaboration in pilot projects' implementation to create awareness and involvement of key educational and business community actors in introducing Hands-On Inquiry Centered Science Systems.
- Creation of INNOVEC, a non-governmental Mexican organization with strong participation from the private sector, that will continue to promote these models, help to find financial support, and seek more involvement of the private sector in collaborating with "hands on inquisitive science teaching systems".
- Promotion of bi-national research in evaluation processes that can adequately measure the impact of these systems in helping students to think and act in a scientific manner.

Sponsors

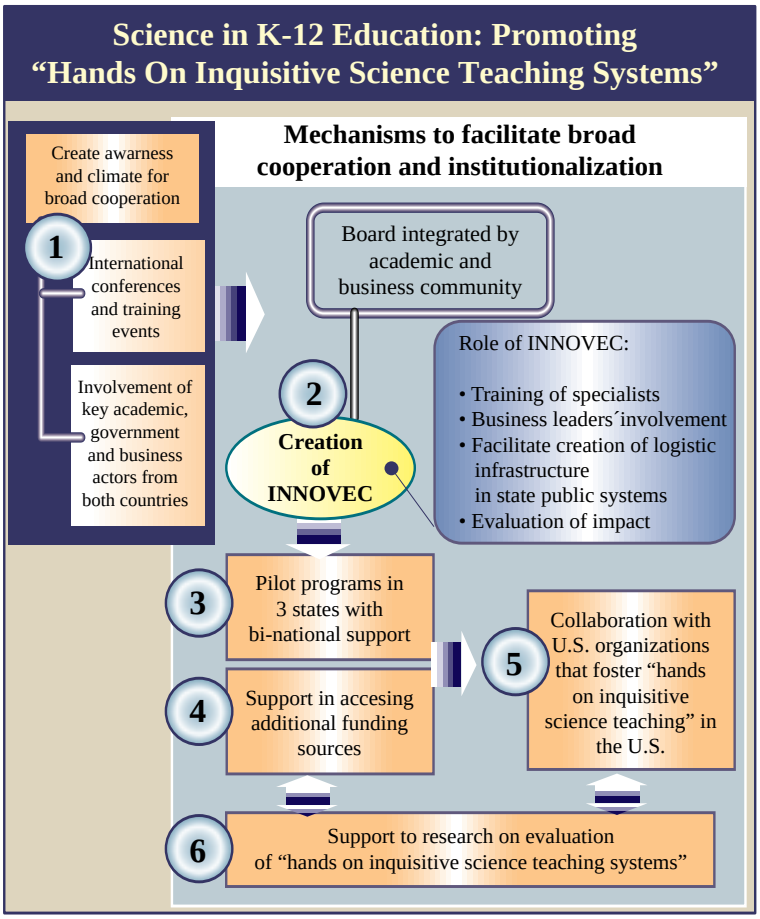
Ministry of Public Education, U.S. National Academies, Bristol-Myers Squibb, Bacardi Foundation and World Bank.

Program Partners

Education Ministries of the States of Nuevo Leon, Coahuila, Tamaulipas and Hidalgo, Valle Imperial Project, Economic Development S.C. Group, Peñoles Industries, Mexico and U.S. Academies of Science, National Science Resource Center.

Main Results

Hands-On Inquiry Centered Science Systems are being implemented in four states in Mexico as a result of the collaboration between the Mexican Ministry of Education, state governments, private sector representatives and FUMEC. INNOVEC, which is an NGO recently created with the support of the Foundation, is working on promoting the expansion of these systems to other states and involving the private sector as an active collaborator along with the educational system. Collaboration with U.S. organizations is strengthening the presence of this type of systems in U.S. border states.



Key actions and results:

1. During 2002 and 2003 FUMEC organized two international conferences and several training programs that contributed to structure Hands-On Inquiry Centered Systems, applicable to Mexico.
2. FUMEC contributed to the creation of INNOVEC in August 2002.
3. With support of INNOVEC and the Foundation, three states (Nuevo Leon, Coahuila and Tamaulipas) have already launched programs with Hands-On Inquiry Centered Systems. Up to now, 75,000 children have participated in these programs, and the State of Hidalgo will be implementing it in 2004.
4. FUMEC has worked with U.S. and Mexican Universities to set up collaboration projects to establish adequate science education evaluation systems.
5. In collaboration with SEP and INNOVEC, FUMEC is working to attract financial resources that can support the expansion of the program to other states in Mexico.
6. FUMEC is also collaborating with the U.S. National Academies to strengthen Border U.S. States "inquisitive and hands on science education systems".

Perspectives

- In collaboration with the Science Academies of both countries, FUMEC will continue to support the use of Hands-On Inquiry Centered Systems in Mexico and the U.S.

C.2 University-Industry Consortium to Build Micro-Electromechanical Systems Capacity Linked to Production Chains of Strategic Importance to U.S. and Mexico

Challenge

Within the framework of North America's regional competitiveness, it is important to foster the integration of strategic production chains, where Mexico can become a stronger partner by developing human talent, technological capabilities and entrepreneurial infrastructure. Partnerships between academia and industry can make this happen.

Strategy

FUMEC is collaborating with CONACYT, which is championing this approach, by establishing the bases for a bi-national consortium in the area of MEMS (Micro-Electromechanical Systems).

Sponsors

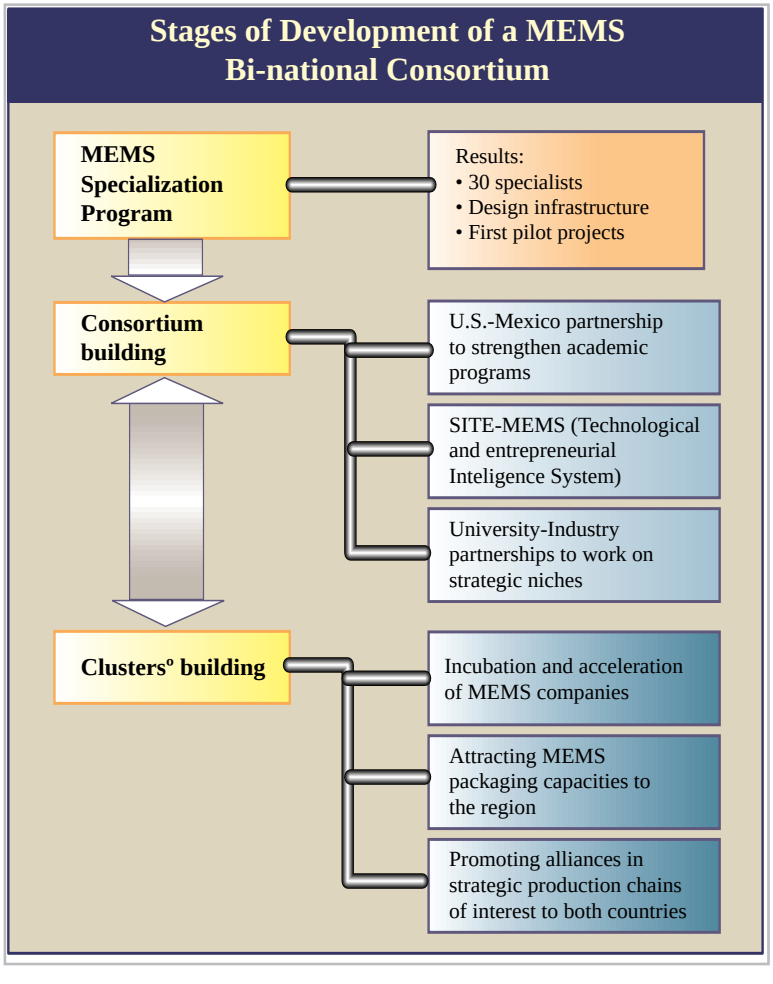
U.S.-Mexico Foundation for Science, Mexican Ministry of Economy, CONACYT.

Program Partners

Sandia National Laboratories, MANCEF (Micro and Nanotechnology Commercialization Education Foundation), Autonomous University of Ciudad Juarez, Autonomous Mexican National University, Guadalajara University, Cinvestav-Guadalajara, Veracruz University, University of Texas at Arlington, University of New Mexico, Electrical Research Institute, Control Accessories S.A., MEMScAP Inc, Coventor, Ardesta, Honeywell, Delphi Technical Center, University of Texas at El Paso, ITESM, Astrophysics, Optic and Electronic National Institute, Popular Autonomous University of Puebla State and Higher Technological Institute of Irapuato.

Main Results

During 2003, through a bi-national collaboration initiative, a Specialization Program was conducted to train Mexican specialists in MEMS design technologies. Out of this effort, several pilot projects are being developed, universities from U.S. and Mexico are partnering in organizing exchanges and this capacity is being presented to corporations, to build the bases for a consortium.



Key actions and results:

- MEMS specialization program with participation of U.S. and Mexican institutions, that prepared 30 specialists.
- Introduction of MEMS courses in Engineering Curricula in several Mexican universities.
- Development of project pilots in designing and building MEMS devices.
- Establishing the bases to integrate a formal bi-national MEMS consortium with universities, research institutes and business.

Perspectives

- In close collaboration with CONACYT, FUMEC will work on launching the Bi-national MEMS consortium, ensuring strong business as well as academia participation.

Enhancement of Human Resources in Science and Technology

C.3 Academic Exchanges

Challenge

The U.S. and Mexico neighborliness is an ideal setting to strengthen scientific and technological linkages, related to problems of common interest. People are the key factor; therefore, several exchange mechanisms are required to keep the flow of knowledge and good will.

Strategy

Since its creation, FUMEC has supported, in collaboration with the Mexican Academy of Sciences and the American Chemical Society, summer fellowships for young researchers from both countries to familiarize themselves with advanced research techniques and topics. FUMEC also supports visits of distinguished scientists that participate in courses, seminars and workshops. These actions have increasingly been oriented to the development of human resources related to FUMEC's programs in areas of bi-national interest.

Sponsors

United States-Mexico Foundation for Science, American Chemical Society and Mexican Academy of Science.

Program Partners

Mexican institutions: Mexican Institute of Social Security, Northeast Center of Biologic Research, Theoretical Research Center, National Autonomous Mexico University, Iberoamerican University, Scientific Research Center and Superior Education of Ensenada, Ocean and Coast Systems Academic Unity and Neurosciences Institute.

United States institutions: United States Department of Agriculture-Forest Service, Department of Health, Ohio State University, Rutgers University, Princeton, Berkeley, University of Texas-Austin and University of California.

Main Results

- Since 1996, FUMEC has granted 153 scholarships, 59 for students and 94 for professors.
- During 2002 and 2003, 25 scholarships were granted (8 for students and 17 for professors).
- FUMEC partnerships with the American Chemical Society and the Mexican Academy of Science have been crucial for these achievements.

Perspectives

- Strengthen academic exchanges between Mexican and U.S. higher education and research institutions, specially in areas related to other FUMEC programs.

Other Important Activities

Other Important Activities

The Mexican Embassy in Washington organized a reception at the Mexican Cultural Institute on April 10th, 2003, in order to celebrate the 10th anniversary of the United States-Mexico Foundation for Science. More than 90 people attended, representing organizations related to science and technology in the U.S., as well as international organizations.

FUMEC Board of Governors held an important meeting at the White House in April 11th, 2003 with the Director of the NSF and other high level Government officials from the White House and Federal Departments.

In order to facilitate and strengthen FUMEC operations in the U.S., the Foundation opened two new offices. The facility at El Paso started operations in May, 2003. Mike Acosta, Associate Director of the Institute of Policy and Economic Development of UTEP, is in charge of it. The Foundation's facility in Washington started operations in July, 2003. Rosenda Chavez is in charge of this office, located at the National Academies building.

The "U.S.-Mexico Collaborative: Partnering for Technological Advancement Conference" was held on September, 2003 and inaugurated by President Vicente Fox. The conference, jointly convened by Advanced Micro Devices, Inc. (AMD), CONACYT and FUMEC, brought together U.S. CEOs of Hispanic origin and Mexican Government and business leaders to discuss the potential for collaboration in science, technology, and education, to boost development and economic prosperity in Mexico.

The Foundation participated at the 2003 Forum organized by the Sigma Xi Society called "Science and Engineering: Keys to International Understanding". The sessions contributed to analyze the role of scientific and engineering communication and collaboration as enablers for international understanding. FUMEC organized four sessions: Matching Higher Education Programs in MEMS and Nanotechnology; Scientists Participation in High Tech Business Development; New Science & Engineering Capacities for Environmental Health & Risk Communication, and Business Participation in the U.S.-Mexico Collaboration in K-12 Science Education.

Enhancement of Human Resources in Science and Technology

INNOVEC was established in August, 2002. Its Board of Governos is integrated by distinguished businessmen and representatives of academia. Pablo Rudomin, Fernando Solana and Salvador Malo are also members of this Board. The Executive Committee is integrated by: Jaime Lomelin (General Director of Industrias Peñoles), Juan Grau (President of Bacardi Foundation), Jose Luis Fernandez Zayas (President of the Mexican Academy of Engineering), Leopoldo Rodriguez (Grupo Desc Executive Advisor), and Guillermo Fernandez de la Garza (FUMEC President and CEO).

The Second International Conference "Science in Basic Education", organized by INNOVEC in collaboration with FUMEC, the Ministry of Public Education, and the Nuevo Leon Education Authorities, was inaugurated by Doctor Reyes Tamez, Mexican Secretary of Education. This Conference took place in Monterrey, Nuevo Leon in May, 2003. It analyzed the social and economic impact of Hands-On Inquiry Centered Systems, and established bi-national links to foster research on this topic, as well as increased cooperation between the private and the public sector in both countries, to create awareness of the impact on science education in global competitiveness.

Financial Information

Financial Information

PROGRAM FUNDING AS OF DECEMBER 31, 2002 & 2003

(Expressed in US dollars)

	2003	2004
Enviroment and Health	1,406,119	1,444,998
Sustainable Industrial Development	1,264,479	563,808
Human Resources Development in Science and Technology	406,678	237,759
Total program funding	**3,077,277**	**2,246,565**

May 09, 2003.

To the Associates of
United States Mexico Foundation for Science:

AVAN C

The accompanying Financial Statements regarding Resources and Obligations of the United States Mexico Foundation for Science for December 31, 2002 and 2001, as well as related Statements of Income and Expenses for the same years have been reviewed. The content of these financial statements is the sole responsibility of the Foundation. The responsibility of Avan C Desarrollo de Negocios, S.C. is to express an opinion upon these Statements based on the audit.

The audit was conducted in accordance with generally accepted auditing principles in Mexico, which require that it be planned and conducted to obtain reasonable assurance on whether the financial statements are free of inaccuracies and have been prepared in accordance with the aforementioned principles. The audit includes an assessment, based on selective tests, of the evidence that is behind the figures and disclosure of the financial statements. It also reviews the accounting principles applied, the primary estimations used by the Foundation, and the presentation given to the Financial Statements as a whole. It is believed that the audit provides a reasonable basis for the opinion provided below.

It is believed that the aforementioned financial statements reasonably represent, in all material aspects, the financial position of The United States Mexico Foundation for Sciences, as of December 31, 2002 and 2001, as well as the results of its operations for the same years, in conformity with generally accepted accounting principles applicable to this type of organization.

Avan C Desarrollo de Negocios, S.C.

C.P.A. Marion López Hernández

Mexico City, Mexico

The Auditors' Financial Statements for 2003 will be received in April, 2004.

The United States-Mexico Foundation for Science
Fundación México-Estados Unidos para la Ciencia

BALANCE SHEET AS OF DECEMBER 31, 2003 & 2002
IN U.S. DOLLARS AT CLOSING EXCHANGE RATE

		2003	2002
ASSETS			
CASH & BANKS		488,477	185,053
RESERVE		1,134,975	897,274
U.S.A. INVESTMENTS YIELD NOT USED AT END OF YEAR		3,313	3,792
MEX INVESTMENTS YIELD NOT USED AT END OF YEAR		1	15
ACCUMULATIVE CHANGE IN INVESTMENT MARKET VALUE		1,092,949	1,243,703
TOTAL INVESTMENTS AND BANKS	**$**	**2,719,715**	**2,329,837**
SUNDRY DEBTORS		341,295	89,674
TOTAL CURRENT ASSETS	**$**	**341,295**	**89,674**
FIXED ASSETS			
FURNITURE AND EQUIPMENT, NET		55,096	62,631
NET FIXED ASSETS	**$**	**55,096**	**62,631**
DEFERRED CHARGES	**$**	**6,737**	**5,492**
TOTAL CURRENT ASSETS	**$**	**3,122,843**	**2,487,634**
LIABILITIES			
SUPPLIERS AND SUNDRY CREDITORS		0	481
TAXES PAYABLE		46,689	55,975
TOTAL CURRENT LIABILITIES	**$**	**46,689**	**56,456**
CAPITAL			
CAPITAL AT THE BEGINNING OF THE YEAR		2,238,571	1,008,877
SURPLUS (DEFICIT) FOR CURRENT PERIOD		837,583	1,422,303
NET WORTH	**$**	**3,076,154**	**2,431,180**
TOTAL LIABILITIES + NET WORTH	**$**	**3,122,843**	**2,487,636**

MEMORANDA ACCOUNTS

INVESTMENTS			
NATIONAL SCIENCE FOUNDATION		4,000,000	4,000,000
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION		3,000,000	3,000,000
UNITED STATES DEPARTMENT OF AGRICULTURE		1,900,000	1,900,000
U.S. ENVIRONMENTAL PROTECTION AGENCY		2,000,000	2,000,000
CONSEJO NACIONAL DE CIENCIA Y TECNOLOGÍA		5,947,368	5,947,368
TOTAL ENDOWMENT	**$**	**16,847,368**	**16,847,368**

Program Directory

Health and Environment

Water and Health in the US-Mexico Border
Ing. Fernando Chacón Murguía
chacon@fumec.org.mx

Environmental Health Network in the Border
M. en C. Ana Rosa Moreno
moreno@fumec.org.mx

Air Quality in Large Cities
Jorge Bustamante
bustamante@fumec.org.mx

Food Safety
Ing. Cristina Acevedo Hernández
acevedo@fumec.org.mx

Promotion of Bi-national Migrant Health Research
M. en C. Ana Rosa Moreno
moreno@fumec.org.mx

Flood Prevention in the Matamoros-Brownsville Region
Ing. Ignacio Castro
castro@fumec.org.mx

Global Climate Change
M. en C. Ana Rosa Moreno
moreno@fumec.org.mx

Environmental Effects of Genetically Modified Crops
Ing. Cristina Acevedo Hernández
acevedo@fumec.org.mx

Industrial Sustainable Development

University-Industry Collaboration for Pollution Prevention
Dr. Jorge Aguirre Martínez
aguirre@fumec.org.mx

Technological Innovation and Pollution Prevention in Micro and Small Firms
Dr. Raúl Carvajal
carvajal@fumec.org.mx

Cross-border Collaboration for the Promotion of Research Centers and High-Tech Firms
Ing. Guillermina Avendaño
avendano@fumec.org.mx

Enhancement of Human Resources in Science and Technology

Science in Basic Education
Lic. Claudia Robles
robles@fumec.org.mx

University-Industry Consortium to Build Micro-Electromechanical Systems Capacity Linked to Production Chains of Strategic Importance to U.S. and Mexico
Lic. Lilia Arechavala Vargas
arechavala@fumec.org.mx

Academic Exchanges
Ing. Guillermina Avendaño Soto
avendano@fumec.org.mx

Institutions Glossary

ACS	American Chemical Society
ACSA	Control Accessories S.A.
AIACC	Assessment for Impacts and Adaptation to Climate Change in Multiple Regions and Sectors
AMC	Mexican Academy of Sciences
AMD	Advanced Micro Devices, Inc.
ATSDR	Agency for Toxic Substances and Disease Registry
BECC	Border Environment Cooperation Commission
BEG	Bureau of Economic Geology (University of Texas at Austin)
BMS	Bristol-Myers Squibb
CalPoli	California Policy Research Center
CAM	Metropolitan Environmental Commission
CANACINTRA	National Chamber of the Transformation Industry
CDC	Center for Disease Control and Prevention
CECATI	Training Center for Industrial Work
CEMCAS	Mexican Center for Water and Sanitation Training
CENALTEC	High-Tech Training Center
CENAPRED	National Center for Disaster Prevention
CETYS	Technical and Superior Teaching Center
CIAD	Research Center in Food and Development
CIBIOGEM	Inter-secretarial Commission on Biosecurity and Genetically Modified Organisms
CIDETEC	Electrochemical Research and Development Center
CIMAV	Advanced Materials Research Center
CINVESTAV	Research and Advanced Studies Center
CMHI	California-Mexico Health Initiative
CMPL	Mexican Center of Clean Production
CNA	National Commission of Water
COCEF	Border Environment Cooperation Commission (BECC)
COEPA	Veracruz Sate Council of Environmental Protection
COFEPRIS	Federal Commission for Sanitary Risk Protection
COLEF	College of the Northern Border
CONABIO	National Commission on Biodiversity Knowledge and Use
CONACYT	National Council of Science and Technology
CONOCER	Normalization and Certification Council for Competent Labor
CRECE	Center for the Development of Entrepreneurial Competitiveness
CSR	Center for Space Research (University of Texas at Austin)
DESC Group	Economic Development, S.C.
DOH	Department of Health
EDA	Economic Development Administration
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization
FDA	Food and Drug Administration
FIPREV/FUNTEC	Fund for Pollution Prevention
FLACSO	Latin-American Faculty of Social Sciences
FMTC	Frank M. Tejeda Center
HHS	United States Department of Health and Human Services
IBWC	International Border and Water Commission
ICW	International Commission of Water
IDB	Interamerican Development Bank
IIE	Electrical Research Institute
IMP	Mexican Petroleum Institute

Glossary

IMSS	Mexican Institute of Social Security
IMTA	Mexican Institute on Water Technology
INAOE	Astrophysics, Optic and Electronic National Institute
INE	National Institute of Ecology
INEGI	National Institute of Data Processing, Geography and Statistics
INIFAP	National Institute of Forestry, Agricultural and Animal Research
INM	National Institute of Migration
INSP	National Institute of Public Health
ITESM	Monterrey Technological Institute of Higher Studies
MANCEF	Micro and Nanotechnology Commercialization Education Foundation
MIAC	Mid America International Agricultural Consortium
MIT	Massachusetts Institute of Technology
NACEC	North American Commission on Environmental Cooperation
NADBANK	International Border and Water Commission
NASA	National Aeronautics and Space Administration
NGO's	Non-governmental organizations
NSF	National Science Foundation
NSRC	National Science Resource Center
OSU	Ohio State University
PAHO	Pan-American Health Organization
PENNTAP	The Pennsylvania Technical Assistance Program
PIFB	The Pew Initiative on Food and Biotechnology
PfP	Partnership for Prosperity
PROFECO	Consumers Federal Attorney
PROFEPA	Attorney General for Environmental Protection
SATE	System of Technical and Entrepreneurial Assistance
SCCAT	Training, Certification and Technical Assistance System
SCERP	Southwest Center for Environmental Research and Policy
SE	Ministry of Economy
SEMARNAT	Ministry of Environmental and Natural Resources
SENASICA-SAGARPA	National Service for Sanity, Quality and Food Safety - Agriculture, Poultry, Rural Developing, Fishing and Food Ministry
SEP	Ministry of Public Education
SNL	Sandia National Laboratories
SRE	Ministry of Foreign Relations
SSA	Ministry of Health
TCEQ	Texas Commission on Environmental Quality
TEEX	Texas Engineering Extension Service
UABC	Autonomous University of Baja California
UACJ	Autonomous University of Ciudad Juarez
UAM	Autonomous Metropolitan University
UAT	Autonomous University of Tamaulipas
UC	University of California
UNAM	Autonomous Mexican National University
UNM	University of New Mexico
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UTA	University of Texas in Arlington
UTEP	University of Texas-El Paso
WB	World Bank