



## HIGHER EDUCATION PARTNERSHIPS IN MEXICO

### An Impact Assessment Report of Eight Higher Education Partnerships U.S.-Mexico Training, Internships, Exchanges, and Scholarships (TIES)



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**Bureau for Economic Growth, Agriculture and Trade/Washington, DC**

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Higher Education for Development was established in 1992 by the six major U.S. higher education associations to engage the higher education community in global development.

American Council on Education (ACE) | American Association of Community Colleges (AACCC) | American Association of State Colleges and Universities (AASCU) | Association of American Universities (AAU) | Association of Public and Land-grant Universities (APLU) | National Association of Independent Colleges and Universities (NAICU)

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## ACRONYMS

ACE	American Council on Education
ALO	Association Liaison Office for University Cooperation in Development
BCSEP	Bilateral Civil Society Educational Partnership
BUAP	Benemérita Universidad Autónoma de Puebla
CEMEFI	Centro Mexicano para la Filantropía, Center for Mexican Philanthropy
CEMIRN	Centro de Manejo Integral de Recursos Naturales, Center for Integrated Management of Natural Resources
CITRO	Center for Tropical Research
CIQA	Centro de Investigación en Química Aplicada, Center for Applied Chemical Research
CONACyT	Consejo Nacional de Ciencia y Tecnología
CU	Cornell University
EGAT	Bureau for Economic Growth, Agriculture and Trade, USAID
HED	Higher Education for Development
ITESM	Instituto Tecnológico y de Estudios Superiores de Monterrey
LAII	Latin American and Iberian Institute
MBA	Master of Business Administration
NAFTA	North American Free Trade Association
NGO	Non-Governmental Organization
NRM	Natural Resources Management
PIFI	Programa Integral de Fortalecimiento Institucional
PFP	Partnership for Prosperity
PPP	Programa Postgrado de Planeación
PSU	Pennsylvania State University
TUNA	Technology, University, Automation
UADY	Universidad Autónoma de Yucatán
UAQ	Universidad Autónoma de Querétaro
UDG	Universidad de Guadalajara
UG	Universidad de Guanajuato
UGA	University of Georgia
UND	University of Notre Dame
UNM	University of New Mexico
URI	University of Rhode Island
USAID	United States Agency for International Development
UQROO	Universidad de Quintana Roo
UTA	University of Texas at Austin
UV	Universidad Veracruzana
UW	University of Wisconsin-Madison
WVU	West Virginia State University

## EXECUTIVE SUMMARY

**Study Description:** Results from this evaluative assessment of eight higher education partnerships in Mexico during Fall 2010, demonstrate that this USAID-funded higher education partnership program provides impact in terms of:

- human capacity building or improved knowledge and skills for faculty and students;
- higher education institutional capacity strengthening to improve teaching, implement research, and deliver extension and public service;
- effects on national development goals; and
- value to the U.S. institutional partners.

The assessment study also focused on lessons learned related to partnership successes and suggestions for future TIES partnerships in Mexico. Since a ‘partnership’ implies reciprocal commitments and mutual benefits, it was important that this impact assessment include partnership capacity building benefits for both host country and U.S. partner institutions.

These quantitative and qualitative findings and results are drawn from a comprehensive review of information from the following sources:

- a review of partnership semi-annual and closed-out narrative and financial reports;
- a summary of responses to a written survey sent to the eight U.S. partnership directors;
- a roundtable discussion with the eight U.S. partnership directors in Washington, DC; and,
- site visits and interviews with host country partners in Mexico.

The eight partnerships in the study sample were funded between 2003 and 2008. One was funded for two years, three for three years, and four for four years. The individual awards varied from \$189,000 to \$493,000. See Figure 1 (page 4) for partnership locations. The partnership technical topics included:

- Natural Resources Planning (1)
- Higher Education Leadership Development (1)
- Rural Economic Development (3)
- Rural Agriculture Development for Small Farmers (3)

The U.S. partners consisted of seven public and one private university. In the world of international development work, these partnerships were funded for very short time periods with very small amounts of money. (See Table 1)

**Overall Findings:** The first evidence of impact appeared in the enormous amount of partnership *cost-share* resulting over time. Over the life of the partnerships, cost-share has been reported as ranging from 56 percent to over 250 percent of the original funding award. Similarly, partners described additional *leveraged funding* ranging from \$7,000 to over \$400,000 per partnership as an outcome of follow-on activities, often after the formal award had closed. (See Table 2)

*Human capacity building* and *institutional capacity strengthening*, primary goals of these partnerships, were achieved in all eight. Mexican human capacity building was measured by numbers of degrees earned; formal certificates awarded; numbers and types of non-degree events attended; short-course and seminar training at the faculty, graduate, and undergraduate levels; internship participation; exchanges conducted; and conference organization and presentations. Non-degree training was also calculated for beneficiaries outside the formal university setting through extension and public service events. Table 3 shows that each of the partnerships recorded training leading to degrees, certificates, and non-degree events; and, Table 4 describes partnerships by exchanges, and internships. Table 5 shows training outside the university for local citizens, state governments, NGOs, workforce development, and the private sector.

*Institutional strengthening* focused on increased faculty and student research, improved teaching methods, new programs, curricula, courses, fieldwork, publications, conference presentations, and interaction with policy makers. Again, the study found ample evidence that institutional changes were occurring in each of the host country institutions. (See Table 6 for examples)

These capacity changes were happening not only at the host country institutions, but also on the *U.S. partner campuses*. Each of the U.S. directors described value from exchanges, benefit to U.S. academic programs and courses, new research studies launched, and publications and papers given as a result of the partnership activities. Table 7 describes these benefits in detail for each U.S. institution.

This study design specifically included queries to beneficiaries to ascertain partnership value toward *national development goals*. ‘Knowledge to the people,’ or extension and public service activities were tabulated for each of the partnerships. The outcomes were wide-ranging and some examples are:

- curriculum for disaster mitigation that was shared with local governments for future planning;
- civil society training that included community participants;
- expanded local knowledge around dairy products, dairy production, dairy producers;
- support for small farmer livestock production and management;
- leadership training for rural youth through expanded 4-H activities;
- diversification of vegetable crops for small producers;
- entrepreneurial training for small businesses and farmers;
- small business development center (SBDC) start up; and
- expanded greenhouse technology that is affordable and manageable for small rural producers.

Table 8 in the text describes in detail sustainable impacts from higher education capacity building that are affecting national development goals. Overall this sample of eight partnerships, funded for small amounts of money for short periods of time, in some way addressed most of the ten priority areas for the Common Development Agenda. (See following chart)

A key outcome of the study has been *lessons learned related to partnership success*. All partners provided recommendations for varying the delivery models, and extending the length of the partnerships

to gain maximum benefits from new faculty knowledge, teaching methods, and applied research work that can be shared with beneficiaries. Student preparation for degree study in the United States clearly requires improved methods for English language preparation. Being more aware of the differences in the U.S and Mexican ‘cultures of higher education’ is a critical component for maximizing future partnership benefits. Expectations for faculty workloads, reward structures, and public service commitments all vary enormously from one country to the other.

Unexpected findings gleaned from face-to-face interviews with partnership directors are part of the value from this type of impact assessment. This TIES study has produced serendipitous results no one knew existed, often as evidence of capacity building and work toward development goals after the partnership formally ended. Table 9 outlines examples of *serendipitous findings*.

Suggestions for future partnerships include:

- a) a clear development focus with goals and objectives that align partnership capabilities with partnership goals that both partners understand and accept;
- b) the importance of faculty capacity building, which happens in different ways for existing faculty, new faculty, and graduate students who will become faculty;
- c) building a critical mass around subject matter to contribute to national development goals (i.e., for the greenhouse project to be sustainable, there had to be a sufficient number of faculty trained with appropriate skills);
- d) longer award periods needed to institutionalize programmatic changes and add new degrees to the university offerings;
- e) some form of student tracking to substantiate long-term benefits from higher education capacity building;
- f) English language proficiency as a prerequisite; and
- g) formalize some evaluative structures for monitoring institutional changes.

Human capacity building and institutional capacity strengthening are inseparable since the credibility of the institution is often dependent on the quality of its faculty and the kinds of courses they teach. When faculty knowledge and skills are adequate to support the goals of the institution, it is then possible to share that expertise with the government through policy advising, with the private sector for small business and workforce development, and with community beneficiaries to improve their quality of life as a way to impact national development goals.

**Examples of Evidence of Impact from Enhanced Capacity of Mexican Higher Education to Respond to the Common Development Agenda \***  
Results from Eight Partnerships 2002 – 2008

Priority Area	1. Universidad de Quintana Roo/ University of New Mexico	2. Benemérita Universidad Autónoma de Puebla/ University of Texas at Austin	3. ITESM-Querétaro/ University of Wisconsin, Madison	4. Universidad Autónoma de Yucatán/ Cornell University	5. Universidad Veracruzana/ University of Georgia	6. Universidad de Guadalajara/ University of Notre Dame	7. Universidad de Guanajuato/ Pennsylvania State University	8. Universidad Autónoma de Querétaro/ West Virginia University
Expanding trade and investment			Strengthened trade links by familiarizing students with dairy industry in the United States and through faculty collaboration on manufacture of Hispanic cheeses for sale throughout Mexico and the USA.		A cadre of Mexican graduate students trained with expertise to aid Mexican farmers and exporters.	Mexican cooperative able to eliminate intermediaries and directly supply U.S. customers.	Graduates employed by John Deere in Mexico.	
Promoting environmental protection, alternative energy, and ecotourism	New Master's program in NRM Management developed. Graduated Mexican scholars working in NRM. Associate Degree proposed. New curriculum developed for broad government use in disaster mitigation. Ecological planning & policy advising, training for management of natural resources at local and state levels.							Expanded use of greenhouse technology in region supports environmental efforts; expanded to other regions.
Strengthening small and microenterprise			Dairy production offers year-round employment and helps keep families together earning income rather than traveling to U.S.	Livestock owners and other professionals benefited from decision support for systems they manage through short courses.		Rural community development diplomado program started.	Workforce development for greenhouse production.	
Increasing agricultural production, extension, processing and marketing				Established Farmer Field Day for local community.	Strong support for Agricultural Diversification products and marketing.	Business support provided for local, small scale producers.	Extension program in Guadalajara re-established.	Established consulting services for organic vegetable production.
Enhancing business and NGO management, finance, and marketing		Support for non-profit entities. New courses and	Promoted employment growth in dairy sector.		TIES trained economist promoting agricultural	TIES interns with BAs leading the development of a SBDC offering	Implemented expanded community agricultural extension program to	

Priority Area	1. Universidad de Quintana Roo/ University of New Mexico	2. Benemérita Universidad Autónoma de Puebla/ University of Texas at Austin	3. ITESM-Querétaro/ University of Wisconsin, Madison	4. Universidad Autónoma de Yucatán/ Cornell University	5. Universidad Veracruzana/ University of Georgia	6. Universidad de Guadalajara/ University of Notre Dame	7. Universidad de Guanajuato/ Pennsylvania State University	8. Universidad Autónoma de Querétaro/ West Virginia University
		programs offered .			diversification for small-scale marginal coffee farmers in Veracruz.	consultation for entrepreneurs.	support development of new agricultural products for income generation.	
Broadening micro-finance, international finance and remittance utilization								
Augmenting development/use of telecommunications and information technology				Web-based courses developed and posted online for multiple users				
Improving public administration, transparency, and accountability		Improved communication between government and civil society through community participation.						
Advancing application of engineering technology							Research and Training for plasticulture, and for hydroponic forage production.	Research and training for technology automation for greenhouse operations.
Furthering competitiveness through research, and human capital development	Graduated Mexican scholars working in Common Development Agenda (CDA)-related Professions.		Graduated Mexican scholars working in CDA-related professions.	Graduated Mexican scholars working in CDA-related professions.	Graduated Mexican scholars working in CDA-related professions.	New courses in business methodology prepare Mexican small- scale entrepreneurs for business enterprises.	Graduated Mexican scholars working in CDA-related Professions; Expanded 4-H Concepts for youth development for future leadership, in rural development.	Graduated Mexican scholars working in CDA-related professions.

\*Expanded detail descriptions found in body of report

**Figure 1.**  
Geographical Location of Eight TIES Partnerships and Date of Partnership Award



**Guanajuato:**

- Universidad de Guadalajara/University of Notre Dame - 2004
- Universidad de Guanajuato/Pennsylvania State University – 2005

**Puebla:**

- Benemérita Universidad Autónoma de Puebla/University of Texas at Austin – 2003

**Querétaro:**

- Universidad Autónoma de Querétaro/West Virginia University - 2005
- Instituto Tecnológico y de Estudios Superiores de Monterrey, Querétaro/University of Wisconsin – Madison – 2003

**Quintana Roo:**

- Universidad de Quintana Roo/University of New Mexico – 2003

**Veracruz:**

- Universidad Veracruzana/University of Georgia – 2004

**Yucatán:**

- Universidad Autónoma de Yucatán/Cornell University - 2004

## Cornell University/Universidad Autónoma de Yucatán TIES Partnership Brief Description

### *Decision Support of Ruminant Livestock Systems in the Gulf Region of Mexico*



**“It is important to help my country and communities – it is important that I give back what I received.”**

– Gabriela González, former TIES student

Andrés Calderon, Gabriela González, and Luis Napte Solis (pictured left to right) received TIES scholarships to study at Cornell University.

#### **Partners: Cornell University(CU)/Universidad Autónoma de Yucatán (UADY)/ Universidad Veracruzana (UV)**

Partnership Title: Decision Support of Ruminant Livestock Systems in the Gulf Region of Mexico  
Partnership Dates: June 2004 – September 2007  
Grant: \$298,401  
Cost Share: \$563,475

This partnership improved productivity, profitability, and rural incomes in Mexico’s Gulf region through a program of training and decision support to the ruminant livestock industry. A fundamental goal was to enhance the capacity to assess and act upon technology, market and policy changes resulting from growth in the global demand for livestock products. Activities included developing an Internet-based platform of teaching, research, and communication for training a mixed group of UADY, UV and Cornell students. Support came principally from training courses both at Cornell and at UADY, and through field studies to learn about the local situation and to supply local farmers with information and tools to improve their productivity and profits. This program was tailored so that the partners and other Mexican institutions, through innovative applications of sustainable and profitable technologies, could enhance local capacity to lead animal agricultural development in the Gulf region. By the end of the award period, the partners had collaboratively addressed an array of complex development issues and challenges related to the adaptability of participants in the livestock and marketing system to respond to growing demand for livestock products, and to changes in technology and trade policy.

## University of New Mexico/Universidad de Quintana Roo TIES Partnership Brief Description

### *Academic and Professional Training for Natural Resources Planning and Management*



**“We benefited from the UNM model of education in the planning program – it was multidisciplinary and had teams of students doing field work.”**

– Dra. Lourdes Castillo Villanueva, General Secretary at UQROO and Professor in the master’s program.

Meeting with HED assessment team about UQROO’s unique postgraduate program; planning with an environmental planning perspective. The program has the distinction of being recognized as a “program of quality” from CONACyT and receives significant funding from the Mexican government through the CONACyT and PIFI programs.

Left to right: Meena Nabavi, HED; Jennifer Sisane, HED; Rector José Luis Pech Vázquez, Carol Robles, HED; and Professor Roberto Acosta.

### **Partners: University of New Mexico (UNM)/Universidad de Quintana Roo (UQRoo)**

Partnership Dates: August 2003 – October 2006  
Grant Amount: \$188,900  
Cost Share: \$136,535

This partnership brought together the resources and expertise of the two lead institutions—the University of New Mexico (UNM) and the Universidad de Quintana Roo (UQRoo)—with additional support from the University of Rhode Island’s (URI) Coastal Resources Center, Dirección de Zona Federal Marítimo Terrestre de la Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT), Colegio de Biólogos del Tecnológico de Chetumal, Amigos del Manatí, Amigos de Sian Ka’an, and UNM’s Latin American and Iberian Institute (LAI). UQRoo initiated the partnership because of the need for high quality applied scholarship and teaching in the Southeast of Mexico, particularly the state of Quintana Roo, to inform critical ecological planning and policy decisions for the management of natural resources. The partnership drew upon the various expertise and commitments of UNM, UQRoo, and URI to develop a proposed Natural Resources Planning and Management (NRPM) Graduate Program at UQRoo. That program was approved by the UQRoo governing body before the TIES grant was awarded, and is now called the Programa Postgrado de Planeación (PPP). To accomplish the goals of the project, the partnership engaged in PPP program development that included building collaborative institutional relationships, outreach, and community development.

## University of Texas at Austin/Benemérita Universidad Autónoma de Puebla TIES Partnership Brief Description

### *Bilateral Civil Society Educational Partnership*



**“[The studies abroad] triggered the interest of the students to study these [civil society] themes. We are in infancy in this aspect – the U.S. and Canada have more experience. We have different realities.”**

– Ana Luisa Rojas Marin, Coordinator of International Mobility and New Project Development at Benemérita Universidad Autónoma de Puebla

Dr. Ricardo Paredes Solorio, director of the School of Administration at Benemérita Universidad Autónoma de Puebla (BUAP) and Ana Luisa Rojas Marín, the coordinator of international mobility and new project development, shared recent progress such as the upcoming book about democracy and development of civil society.

### **Partners: University of Texas at Austin (UTA)/Benemérita Universidad Autónoma de Puebla (BUAP)**

Partnership Dates: January 2003 – January 2007  
Grant Amount: \$212,162  
Cost Share: \$537,695

The Bilateral Civil Society Educational Partnership (BCSEP) addressed the strengthening of Mexico’s civil society sector through developing the human, organizational, and knowledge capital of the country’s not-for-profit sector. The partners organized an exchange of 15 Mexican students to the University of Texas at Austin (UTA) during the spring of 2004 and through Summer Institutes held in 2004, 2005, and 2006. Additionally, they convened conferences and other activities for curriculum development and research to support the development of Mexican civil society organizations through program development and leadership training. Faculty and students reported that the most powerful aspect of the BCSEP program was the student exchange, which sparked rich dialogue and exploration among U.S. faculty and students and the Mexican exchange students about civil society in their respective countries. This partnership is particularly notable for the strong mutual benefit for both partners. The BCSEP program helped to build institutional capacity at the University of Texas at Austin by introducing an international component for the work of the RGK Center for Philanthropy and Community Service at the Lyndon B. Johnson School of Public Affairs at UTA. This component supported the development of curriculum for new courses at UTA’s School of Public Affairs.

## University of Georgia/Universidad Veracruzana TIES Partnership Brief Description

### *Universidad Veracruzana-University of Georgia: A Partnership for Rural Economic, Educational and Human Capital Development*



**“The best benefits are coming.”**

– Ernesto Rodriguez Luna,  
Professor and Director of the Center  
for Tropical Research (CITRO) at  
Universidad Veracruzana

**“Our linkage with UGA remains.”**

– Katia Romero Leon,  
former TIES scholar and current  
instructor at Universidad  
Veracruzana

HED assessment team and Center for Tropical Research (CITRO) faculty at Universidad Veracruzana in the office reception area at CITRO. Left to right: Lynn Simmonds, HED; Katia Romero Leon; María Del Carmen Vergara-Tenorio; Silvia Del Amo-Rodríguez; Jennifer Sisane, HED; Carol Robles, HED; and Ernesto Rodriguez Luna.

#### **Partners: University of Georgia (UGA)/Universidad Veracruzana (UV)**

Partnership Dates: April 2004 – September 2008  
Grant Amount: \$298,298  
Cost Share: \$216,401

The partnership linked the Universidad Veracruzana (UV) and the University of Georgia (UGA) in a comprehensive program of master’s level training for seven Mexican students; curriculum development; collaborative and applied research in agricultural diversification; and outreach programming to strengthen the competitiveness of the trade-led rural economy through product diversification and niche marketing. Since an estimated one of every five Mexicans is involved in farming, Mexico’s agricultural economy directly impacts the country’s economic and political stability, and competitiveness in a global marketplace. UGA and UV overcame a number of obstacles to ensure that students were selected, supported with academic resources and personal attention, and graduated. The partnership jointly trained a cadre of seven master’s degree students to offer expertise to Mexican farmers, exporters, and rural educators. As a result of this partnership, UV faculty acquired expertise in agribusiness, housing and consumer science, food science and technology, and instructional technology. Most importantly, UV has strengthened its long-term capacity to improve the socio-economic status of rural communities.

## Pennsylvania State University/Universidad de Guanajuato TIES Partnership Brief Description

### *Educational Program to Train Extension Professionals to Assist Small Growers in Mexico with Technology Applications for Production Agriculture*

**“This is our time.  
This is our opportunity.  
Education is the base for  
all real development, the  
base for possibilities and  
changes in this world.”**

– Manuel Collado,  
Coordinator of Extension  
and Partnerships,  
Irapuato Campus,  
Universidad de  
Guanajuato



HED staff met with rural agricultural producers to discuss the lasting impacts of the agricultural extension partnership between Penn State University and the Universidad de Guanajuato. (Left to right: Manuel Collado (Mexican Partnership Director – Universidad de Guanajuato), Ramon Fiores Pantoga (PROLECHE Milk Producers Cooperative), Juan Simon Zambrano (PROLECE Milk Producers Cooperative), Manny Sanchez (HED), Emily Gartner (HED), Susana García (“Mujeres Trabajando” Women’s Agricultural Cooperative)

#### **Partners: Pennsylvania State University (PSU)/Universidad de Guanajuato (UDG)**

Partnership Dates: February 2005 –September 2007  
Grant Amount: \$246,813  
Cost Share: \$137,555

This partnership aimed to increase the production of locally produced horticultural crops by small growers in Mexico. The partnership included a second Mexican institution, the Agroplastics Department at El Centro de Investigación en Química Aplicada (CIQA) in Saltillo, Mexico and also received supplementary financial and other support from the Ministry of Agriculture of the State of Guanajuato, the Pennsylvania Department of Agriculture, a farmer’s cooperative, La Puríssima, in the State of Guanajuato, and various U.S. companies. The partnership took a three-pronged approach to assist the Mexican institutions in reaching the small farmers with the latest information on the use of plastics in the production of horticultural crops by providing formal training, research collaboration, and an extension program. The principal objectives for this project included building applied research capabilities in the area of plasticulture technology; creating a new master’s degree program in Guanajuato to train the next generation of extension educators; and equipping students to transfer new technologies to the farming communities in Guanajuato, thereby boosting productivity and incomes among the disadvantaged rural communities.

## University of Wisconsin-Madison/ITESM-Querétaro TIES Partnership Brief Description

### *Dairy Training, Research, and Extension for Economic Development and Trade*



**“[The student interns’] resumes have been strengthened considerably due to this partnership and they are all holding relevant jobs.”**

– Mr. Andrés García,  
Partnership Director, Director of the  
Department of Agronomy, ITESM-  
Querétaro, Tec de Monterrey

The HED team poses with ITESM-Querétaro faculty and two alumni who participated in summer internships on Wisconsin dairy farms. From left: Josh Henson (HED), Andrés García (ITESM-Querétaro), Alejandro Cervantes MacSwiney (ITESM-Querétaro), Max and Alberto (ITESM-Querétaro alumni), Sonia Vásquez (ITESM-Querétaro), Noopur Vyas (HED), and Charlie Koo (HED).

#### **Partners: University of Wisconsin-Madison (UWM)/ITESM-Querétaro**

Partnership Dates: February 2003 – September 2007  
Grant Amount: \$299,995  
Cost Share: \$633,210

Dairying can be a powerful engine for economic growth in rural communities because it can provide a regular, year-round source of income; it generates significant employment in production and processing; and it greatly improves nutrition, particularly for children. Additionally, manure can increase crop production. The overall goal of this partnership was to strengthen these positive developmental effects of dairying.

Collaboration between institutions enhanced the efficacy of dairying as an engine for development by enhancing the skills of Mexican dairy professionals and strengthening dairy trade links between the United States and Mexico. The partnership engaged in a wide range of activities, including developing customized training programs for faculty from ITESM-Querétaro, Tec de Monterrey; assessing the training needs of U.S. Hispanic dairy workers and Mexican dairy subsistence farmers; reviewing training materials currently available in Spanish for U.S. Hispanic workers and Mexican dairy subsistence farmers; developing new training materials to meet current needs; assessing the training needs of Mexican dairy technicians and implementing workshops to address those needs; developing and implementing training-the-trainer workshops for employees of *Fundación Produce*; developing cross cultural summer internship programs for ITESM-Querétaro, Tec de Monterrey students to learn about the U.S. dairy industry; developing research summer internship programs for ITESM-Querétaro, Tec de Monterrey students to obtain hands-on research experience; establishing collaborative projects between faculty from ITESM-Querétaro, Tec de Monterrey and University of Wisconsin-Madison (UW); developing and implementing dairy study tours to Wisconsin for ITESM-Querétaro students to learn about U.S. dairy industry; and organizing dairy study tours to Mexico for UW-Madison students to learn about the Mexican dairy industry.

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## West Virginia University/Universidad Autónoma de Querétaro TIES Partnerships Brief Description

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### *WVU-Querétaro Partnership for Greenhouse Technology for Rural Semiarid Regions of Mexico*



**“A good idea and hard work are more important than money for the success of a partnership.”**

— Dr. Gilberto Herrera  
Dean of the UAQ College of  
Engineering

Left: Rows of greenhouses at the Amazcala complex  
outside of Querétaro

#### **Partners: West Virginia University (WVU)/Universidad Autónoma de Querétaro (UAQ)**

Partnership Dates: September 2005 – September 2008  
Grant Amount: \$492,719  
Cost Share: \$483,479

This partnership contributed expertise in engineering sciences, agricultural sciences, business and extension on key issues related to greenhouse technology development and use to provide graduate level training for students, faculty exchanges, and workshops for students, researchers, and small producers. The primary activity related to the development of technology automation for greenhouse operation to help small rural producers “control” climate conditions, lighting, and irrigation cycles in greenhouses, so that owners (small rural producers) can dedicate their time to treating and managing the produce. Research conducted around automation produced an automation control system called TUNA (translated as; Technology, University, Automation) which is aimed at controlling heat, ventilation, light, and irrigation for greenhouse installations. This system was developed by engineers at UAQ working with WVU at UAQ’s Amazcala Greenhouse Complex. Additionally, two academic programs were established at UAQ as a result of this partnership: a graduate master’s degree in engineering with a specialization in greenhouse technology aimed at training professionals who can design, build, operate, and maintain greenhouse facilities—small or industrial—and an associate degree program at the undergraduate level for future operators and managers of small greenhouses. These two programs were focused on upgrading local knowledge and skills to establish greenhouse technology and to form a critical mass of greenhouse operation skills in the community. The overall goal has been sustainable economic development for rural families who are, for the most part, unable to find sustainable employment sources in their rural communities. The activities and outcomes of the partnership work toward reducing poverty among rural Mexicans.

## University of Notre Dame/Universidad de Guadalajara TIES Partnership Brief Description

### *Academic and Professional Training for Natural Resources Planning and Management*



**“If I didn’t have this training, I couldn’t be here.  
The TIES program determined my current  
professional profile.”**

– Sandra Rosas Mercado, TIES internship  
participant at Castillo Tomatoes. Mercado  
obtained her MBA through the program.



Top left: HED staff members learn about the production process at a Tequila distillery plant in Ixtslan, a rural town in the Mexican state of Jalisco. The tequila distillery hosted American and Mexican business students during their internships with the TIES partnership between the Universidad de Guadalajara and the University of Notre Dame. (Pictured: Manny Sanchez and Emily Gartner of HED)

Bottom left: HED staff members meet with local honey producer, Manuel Ruiz Pérez (Miel Jalisco), who hosted American and Mexican TIES student interns through an HED partnership between University of Notre Dame and University of Guadalajara. (Left to right: Emily Gartner (HED), Manny Sanchez (HED), Manuel Ruiz Pérez (Miel Jalisco), Hector Galván Blanco (Universidad de Guadalajara) and Meena Nabavi (HED))

#### **Partners: University of Notre Dame (UND)/Universidad de Guadalajara (UDG)**

Partnership Dates: July 2004 – May 2008  
Grant Amount: \$299,738  
Cost Share: \$364,839

This partnership created better economic and business opportunities for the small agricultural producers in the rural areas surrounding Guadalajara by providing them with the skills and information needed to benefit from the North American Free Trade Agreement (NAFTA). To prepare Mexican faculty to teach entrepreneurship to their graduate students (who in turn will train and advise small agricultural producers), two professors from Universidad de Guadalajara (UDG) traveled to the University of Notre Dame (UND) to participate in entrepreneurship courses, receive training in entrepreneurship teaching models, and collaborate with UND faculty. Both professors took part in the selection and training of Notre Dame MBA graduate and advanced undergraduate students who interned with (UDG) MBA students at UDG in summer 2005. UDG also designed a new minor in entrepreneurship and agribusiness, offered in the College of Business, as well as a new certificate program in this field to prepare Mexican professionals to become managers, consultants, and researchers in the rural sector.

## BACKGROUND

### *Introduction*

This assessment study describes the impact of human and institutional capacity building on eight higher education institutions in Mexico and the effect of that capacity building on national development goals. This Mexico institutional partnership program began in 2002, the start of the U.S. – Mexico Training, Internships, Education and Scholarship (TIES) Program.<sup>1</sup> Activities were funded under a Cooperative Agreement between the United States Agency for International Development (USAID) and Higher Education for Development (HED) at the American Council on Education (ACE) with the goal of “building human capacity through education and training” and increasing the contribution of host-country institutions of higher education to sustainable development.

### *The Origins of the U.S.-Mexico TIES Partnership*

In November 2001, the USAID Mission in Mexico, with support from the U.S. Embassy, announced the U.S.-Mexico Training, Internships, Education and Scholarship Program as a six-year, \$50 million public-private alliance between USAID and higher education, together with the non-profit and for-profit sectors in both Mexico and the United States. This higher education institutional strengthening program was to receive \$30 million from the U.S. Government through USAID; and \$20 million contributed through tuition waivers and matching grants from U.S. universities, cost sharing by Mexican universities, and support from NGOs and corporations. A total of 35 institutional linkages were envisioned with a focus on enhancing higher education’s role in social and economic development through master’s degree training or special graduate programs – some with internships as an integral component, collaborative research, and faculty and student exchanges.

The underlying rationale for the program was the recognition that the United States and Mexico increasingly shared a common agenda for development and that the two countries should address regional and global challenges and opportunities in partnership with each other. Both the North American Free Trade Agreement (NAFTA) and the Partnership for Prosperity, launched in 2002, aimed to build on increased investment and trade with Mexico, and through Mexican regional development efforts by developing new strategies to foster economic growth in less developed areas of the country. Collaboration in research and technology between the academic community and the private sector was seen as promoting capacity for innovation and trade; training was viewed as contributing to the development of human capital and the strengthening of Mexico’s current and future workforce. The USAID/Mexico Mission said that higher education institutions should contribute to more equitable growth and increased competitiveness of the Mexican economy.

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<sup>1</sup> The original title of the program in 2002, “U. S.-Mexico Training, Internships, Education and Scholarship Partnership” changed over time to become known as the “U. S.-Mexico Training, Internships, Exchanges and Scholarships Program.”

## *The First Round of Partnerships*

In 2001, the USAID/Mexico Mission requested Concept Papers from Mexican higher education institutions and their U.S. partners in the following fields of study:

- Education and Human Capital Development
- Natural Resources Management and Environmental Science
- Information Technology for Development
- Health
- Agriculture
- Humanitarian Assistance
- Transparency and Decentralization
- Micro and Small Business Development
- International Finance
- Public Policy and Administration

By January 2002, more than 300 proposals for two-year awards were received ranging in value from \$100,000 - \$300,000. After review and comment, the Mission asked for full proposals by March 15, 2002, with evidence of cash or in-kind support of at least forty percent of the requested award amount expressing a preference for a one-one match that included contributions from the private sector.

During this first round of funding, a total of seventeen institutional partnerships were awarded in the fields of:

- Natural resource conservation and management
- Trans-border public administration
- Water resource management
- International business and marketing
- Agricultural product diversification in rural areas
- Strengthening of dairy trade links with the United States
- Mental health services provision
- Civil society strengthening

Three partnerships selected for this 2010 impact assessment sample were from this first group of awardees. See Table 1 for a list of all partnerships included in this impact assessment.

In 2002, ACE took on the management of future TIES partnerships that included issuance of sub-cooperative agreements to U.S. institutions, and monitoring and reporting of partnership progress to USAID/Mexico.

## *The Second Round of Partnerships*

The Association Liaison Office for University Development (ALO)<sup>2</sup> began managing the application, peer review, and grant making process for TIES partnerships on behalf of the USAID/Mexico Mission issuing its first Request for Applications (RFAs) for thirteen new partnerships in 2003. The award period was extended to three years and the amount of the grant increased to \$300,000 per partnership. Fields of study or development areas, related to the U.S. - Mexico Common Development Agenda, were identified more explicitly,<sup>3</sup> the cost share percentage remained the same, but a major new component was added that at least seven (two semester) scholarships for long-term, master's degree training of Mexicans in the United States be included in each partnership in addition to non-degree training, internships, and exchanges. Three partnerships in this impact study sample are from this second group of awards.

**Table 1.**  
**U.S.-Mexico Higher Education Partnerships by Sector of Focus**  
— 8 TIES Partnerships Included in this Impact Assessment Study —

<b>TIES Partnerships</b>	<b>U.S. Institution</b>	<b>Mexican Institution</b>	<b>Award Period</b>	<b>Sector of Focus</b>	<b>Special Priorities [scholarship requirements]</b>
Phase I, Cycle I 2002 Competition	University of New Mexico	Universidad de Quintana Roo	August 2003- October 2006	Natural Resources Planning and Management	None
2002 Competition	University of Texas at Austin	Benemérita Universidad Autónoma de Puebla	January 2003- August 2007	Higher Education – Leadership Development for the Third Sector	None
2002 Competition	University of Wisconsin-Madison	ITESM-Querétaro	February 2003- September 2007	Rural Agriculture – Dairying	None
Phase I, Cycle II 2003 Competition	Cornell University	Universidad Autónoma de Yucatán	June 2004 – September 2007	Rural Economic Development- Animal Agriculture	Seven (7) scholarships requested for each award
2003 Competition	University of Georgia	Universidad Veracruzana	April 2004 – September 2008	Rural Economic Development- Agricultural Diversification and Niche Marketing	Seven (7) scholarships requested for each award
2003 Competition	University of Notre Dame	Universidad de Guadalajara	August 2004 – May 2008	Rural Economic Development and Small Business Entrepreneurship	Seven (7) scholarships requested for each award
Phase I, Cycle III 2004 Competition	Pennsylvania State University	Universidad de Guanajuato	February 2005- September 2007	Agriculture- Support for Small Farmers	Seven (7) scholarships requested for each award
Phase II, Cycle I 2005 Competition	West Virginia University	Universidad Autónoma Querétaro	September 2005- September 2008	Agriculture and Agro-business for Small-Scale Producers	Ten (10) scholarships requested for each award

<sup>2</sup> Renamed Higher Education for Development (HED) in 2006, at the request of USAID to better reflect the purpose of the work.

<sup>3</sup> Expanding trade and investment; furthering competitiveness and trade enhancement through highly technical production, research and innovation involving U.S. and Mexican higher education institutions working with the Mexican private sector and government; advancing practical development applications for engineering and other advanced technology; augmenting development/use of telecommunications and information technology for development; strengthening small business and microenterprise; broadening microfinance, international finance and remittance utilization for development; increasing health technology and professional health education in Mexico to increase Mexican competitiveness in the health industry, create higher level jobs, and increase the health and competitiveness of the workforce; improving public administration and the transparency and accountability of government, business, or NGO practices; enhancing management, finance, and marketing for business and NGOs; strengthening the competitiveness of the trade-led rural economy through diversification and agricultural niche marketing; and promoting environmental protection, alternative energy and ecotourism.

### ***The Third Round of Partnerships***

In 2004, at the request and direction of USAID/Mexico, ALO issued a special request for applications for up to six awards, five with a focus on rural development and one on tuberculosis research. Partnerships for rural development were to be designed to promote:

- Microfinance and small business development;
- Energy and environmental conservation;
- Private property ownership in rural communities; and
- Support for small farmers affected by adverse economic conditions.

An abbreviated timeframe of 33 months was given for these partnerships in order for activities to be completed within the 2007-2008 financial year, but all other partnership requirements remained the same. A total of 37 institutional partnerships were awarded between 2002 and 2005 in Phase I of the TIES partnership, two more than originally planned. One of the partnerships with a focus on rural development has been selected for this impact study.

### ***The Fourth Round of Partnerships***

In 2005, ALO issued the first RFA for Phase II of the TIES partnership program with additional funding for ten new higher education partnerships. The amount of the partnership award was raised to \$500,000, the cost share reduced to 25 percent, and the number of two semester scholarships for each partnership increased to ten.

Another major change was the specificity of partnership focus areas and the number of awards in each topic area.<sup>4</sup> Only one award was available for a partnership in “Rural Prosperity for Small-Scale Producers.” The awardee for this partnership has been included in the impact study.

The evolution of TIES partnerships included increased specificity on development or focus areas in line with USAID/Mexico Mission priorities. For example, in fiscal 2003, the Mission adopted a new strategic plan with four major areas of focus:

- economic growth (including natural resource management and access to finance);
- accountable governance and the rule of law;
- infectious disease prevention and control; and
- education exchange and scholarships.

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<sup>4</sup> Focus areas for TIES Phase II: Rural & Micro-Finance (1 award); Democracy (3 awards) in legal education, public affairs, forensic science and DNA analysis, mental health services for survivors of trauma; Environment (2 awards) in improved management of parks and protected areas, community watershed management, pollution reduction and efficient energy use; Rural Prosperity for Small-Scale Producers (1 award); Health (3 awards) in prevention and treatment.

TIES Phase II applicants were asked to respond with proposals for partnerships reflecting these four areas. Potential partnership activities throughout the TIES program have remained the same with an emphasis on:

- master's training in the United States for Mexican faculty or students;
- or master's training in Mexico with U.S. faculty or via distance education;
- stand alone internships in the private or public sectors, NGOs or research institutions in the United States;
- faculty specialty training and sabbaticals in the United States for Mexicans;
- faculty and student exchanges (with support for Mexicans only);
- collaborative research for faculty or students (with support for Mexicans only);
- dual degree programs for Mexicans with training in the United States or Mexico;
- short-term training in the United States or Mexico for Mexicans;
- innovative use of technology and distance education;
- joint project activity in Mexico;
- follow-on training in either country for Mexicans;
- collaborative community level outreach and replication projects in Mexico;
- coordination, technical meetings or observation trips in the United States and Mexico;
- public and private sector collaboration;
- joint publications; and
- press and media events.

## FINDINGS AND RESULTS

**Impacts of TIES Higher Education Partnerships.** Findings and results from the TIES 2010 Impact Assessment of eight higher education partnerships are taken from a comprehensive review of quantitative and qualitative data using the following sources of information. See Appendix C for data collection details.

- Summary of partnership sub-cooperative agreements.
- Summary of partnership semi-annual and final narrative and financial reports.
- Summary of U.S. partners' written responses to an HED survey in preparation for the principal investigator roundtable during the summer 2010.
- Summary of U.S. partners' discussion of survey questions during a one-day roundtable meeting in September 2010.
- Observations, site visits, and interviews with Mexican partners in Mexico during fall 2010.

### *Cost-Share Contributions*

Cost-share and other contributions by the U.S. and Mexican partners are considered of strategic importance to the success of the TIES Partnership program since financial contributions beyond the award indicate commitment and sustainability. Initially, the USAID/Mexico Mission designated this program an "alliance" in which a one-to-one relationship between the USAID award and cost-share was expected. The mandatory cost-share amount was forty percent of USAID funding for awards through Phase 1 of the program. Beginning in 2003, the cost-share was reduced to a mandatory 25 percent for the first awards in Phase 2, beginning in 2005.

The data in Table 2 show that all eight partnerships exceeded the minimum required cost-share on awards ranging from \$188,900 to \$492,719, the lowest was 56 percent and the highest 253 percent. Four of the eight partnerships provided more than a one-one match; two of the four provided more than a two-one match. This very high level of cost-share does not take into account, additional, less easily quantified contributions leveraged by both the U.S. and Mexican partners.

### *Leveraging Additional Resources*

Two of the eight partnerships that provided a two-one cost-share match, also leveraged additional funding for a two-one match and a one-one match respectively. The partnership providing the lowest level of cost-share, however, was able to leverage additional resources in excess of 75 percent of the USAID award, primarily in the form of faculty time, research support, and professional meetings and conferences (See Table 2). An example of other leveraged resources reported by the partnership for extension activities at Mexican universities came from municipalities, state governments, and the Ministry of Agriculture in Mexico. The U.S. and Mexican universities provided additional leveraged funds for conference presentations by faculty and for assistantships and scholarships for students. Mexican institutions also contributed funds to cover time spent on the partnership by the principal investigator or administrative

staff, and faculty time on curriculum design and production. U.S. institutions secured additional resources for research planning and doctoral level dissertation support and stipends for master's level research and assistantships. U.S. universities sometimes obtained additional outside funding for:

- training Mexican professionals;
- U.S. undergraduate study tours of Mexico;
- internships for Mexican students; and
- student exchanges.

The picture that emerges is one of considerable engagement, well beyond the initial TIES financial award, in cross-border higher education activities by both sets of partners. Likewise, there is demonstrated willingness, interest, and commitment to invest in research and training at the undergraduate, graduate, and professional levels.

<p align="center"><b>Table 2.</b> <b>U.S. – Mexico Higher Education Partnerships</b> <b>Partnership Funding, Cost-Share, and Leveraged Resources</b> <b>Results of 8 TIES Partnerships</b></p>					
Partners*	Dates	HED Award	Reported Cost-Share	Percentage of Award	Reported Estimated Leveraged Funds**
University of New Mexico; Universidad de Quintana Roo	August 2003 – October 2006	\$188,900	\$136,535	72%	\$49,915
University of Texas at Austin; Benemérita Universidad Autónoma de Puebla	January 2003 – August 2007	\$212,162	\$537,695	253%	\$414,906
University of Wisconsin- Madison; ITESM-Querétaro	February 2003 – September 2007	\$299,995	\$633,210	211%	\$243,763
Cornell University; Universidad Autónoma de Yucatán	June 2004 – September 2007	\$298,401	\$563,475	188%	\$72,950
University of Georgia; Universidad Veracruzana	April 2004 – September 2008	\$298,298	\$216,401	72%	\$33,994
University of Notre Dame; Universidad de Guadalajara	July 2004 – May 2008	\$299,738	\$364,839	121%	\$6,600
Pennsylvania State University; Universidad de Guanajuato	February 2005 – September 2007	\$246,813	\$137,555	56%	\$186,500
West Virginia University; Universidad Autónoma Querétaro	September 2005 – September 2008	\$492,719	\$483,479	98%	\$49,055
<b>Total 8 Partnerships</b>		<b>\$2,337,026</b>	<b>\$3,073,189</b>		<b>\$1,057,683</b>
<p>* For partnerships beginning in 2003 through February 2005 a minimum of 40 percent cost-share was required. For the partnership beginning in September 2005, 25 percent cost-share was required.</p> <p>** Information regarding leveraged funding was not systematically collected from the beginning of the partnerships.</p>					

### *Human Capacity Building*

The U.S. government's goal for launching the TIES partnerships program in 2002, was to strengthen higher education institutions in Mexico and enhance their role in economic and social development by creating the human capital needed to take advantage of the opportunities created by NAFTA and the Partnership for Prosperity. One major goal was to increase Mexico's competitiveness in the global economy. Another was to decrease regional inequality between areas where economic growth was strong

and areas in which growth was weak, particularly in the rural southeast where people's livelihoods depend largely on agriculture.

The benefits of the TIES partnerships were expected to be found not only in higher education institutions, but also at local, state, and national government levels, by the non-governmental sector, in civil society, in the community, and throughout the private sector. The United States and Mexico were facing common development problems, for example, trans-border security, health issues, natural resource management, and environmental sustainability. Likewise, both countries were eager to share new opportunities for small business and entrepreneurial development and international trade in agricultural products and services. All require a critical mass of human capacity. The TIES partnerships provide human capacity value through a variety of training models. More specifically those training models include:

- faculty development or professional development of current faculty through long-term training at the master's level in the United States and in Mexico for Mexican graduate students;
- short-course training at both the undergraduate and graduate levels;
- non-degree training;
- internships in the non-governmental, government, and private sectors for students and faculty;
- exchanges for collaborative research, course design, and
- bi-national conferences.

The TIES program was designed from the outset to provide a large number of graduate scholarships – defined as covering at least two semesters of study in the United States for Mexicans. Most scholarships have been awarded for master's degrees or special graduate programs as part of an institutional partnership.<sup>5</sup>

#### *TRAINING, Internships, Exchanges, Scholarships (TIES)*

Table 3 shows, for the eight partnerships in this sample, the number of Mexicans receiving training in the United States leading to graduate degrees, and the number of Mexicans engaged in non-degree training. Seventeen master's degrees and one doctorate were awarded by U.S. universities as part of the eight TIES partnerships involved in this study. Nine of the master's degrees were earned by women.<sup>6</sup> In addition, seven graduate diplomas were awarded by Penn State University where requirements for enrollment at the formal master's level were not able to be met. Mexican institutions awarded an additional 97 *diplomados* or professional certificates to Mexican students, for example, for successful completion of a new component introduced into an existing MBA program.

All seven men and women Mexican graduate students, who received master's degrees from the University of Georgia, have progressed professionally since graduation as a result of scholarships for training in agribusiness, food science and technology, housing and consumer science and instructional

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<sup>5</sup> In Cycle 1 (2002) no scholarships were explicitly requested by the USAID Mission in Mexico. In Cycle 11 (2003) at least 7 scholarships were requested to meet the goal of 250 scholarships and 35 institutional partnerships over the six-year TIES program.

<sup>6</sup> Data collection instruments changed over the duration of the eight partnerships; some did not include a breakdown by gender.

technology, even though not all have remained at the partner institution. West Virginia University adopted an alternative approach for building a critical mass of human capacity within a higher education institution in Mexico. In place of scholarships for five Mexican students to study in the United States, they focused on providing graduate training in Mexico. This partnership trained 30 new professionals (*diplomados*) in greenhouse technology at Universidad de Querétaro to create the beginnings of a larger critical mass that will continue to grow over time. Likewise, professional training offered by Notre Dame in agribusiness, entrepreneurship and small business development strengthened an existing graduate program at the University of Guadalajara and provided opportunities for 45 students to become consultants in the field of business development.

Non-degree training comprised the major part of knowledge transfer and professional skills training across the eight partnerships. Non-degree training is defined here as “a learning activity taking place in either the United States or Mexico in a setting predominantly intended for teaching or imparting knowledge and information to the participants with designated instructors or lead persons, learning objectives, and outcomes, conducted full-time or intermittently.”<sup>7</sup> Short courses introduced under the TIES partnership provided new learning opportunities for Mexican faculty and students both at the graduate and undergraduate levels and often included local representatives of governmental and professional organizations. Participation in some short courses resulted in the award of a “*constancia*” or certificate. Cornell University and the Universidad Autónoma de Yucatán jointly organized five short courses and provided non-degree training to a total of 328 Mexican professors, scientists, master’s and doctoral students. Likewise, the University of Texas at Austin documented 288 non-degree training opportunities for Mexican faculty, staff, and students, and the University of New Mexico offered non-degree training to 138 faculty and students as shown in Table 3.

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<sup>7</sup> Non-degree training can consist of short or long-term technical courses in academic or non-academic settings, non-academic seminars, workshops or on-the job training.

**Table 3.**  
**Human Capacity Building, Degree and Non-Degree Training**  
Results of 8 TIES Partnerships

U.S. Institution and Mexican Partner Institution	Number of Master's Degrees Earned by Mexican Faculty	Number of Master's Degrees Earned by Mexican Students	Number of Diplomados Certificates Earned by Mexican Students	Total Number of Mexican Faculty/Students Earning Graduate Degrees and Diplomados	Number of Mexican Faculty/Staff Non-Degree training	Number of Mexican Students receiving Non-Degree Training	Total Number of Mexican Faculty, Staff and Students Non-Degree Training
University of New Mexico; University de Quintana Roo	0	1 woman 1 man	15 men 7 women	24	13 men 9 women	71 men 45 women	138
University of Texas at Austin; Benemérita University Autónoma de Puebla	0	0	0	0	6 faculty 2 staff	95 men 185 women	288
University of Wisconsin-Madison; ITESM-Querétaro	0	0	0	0	7 men 1 woman	9 men 7 women	24
Cornell University; University Autónoma de Yucatán	0	3 men	0	3	5 men	271 men 52 women	328
University of Georgia; University Veracruzana	0	5 women 2 men	0	7	3men 5 women	12 men 14 women	34
University of Notre Dame; University de Guadalajara	0	0	45 certificates within the MBA program	45	3 men 5 women	0	8
Pennsylvania State University; University de Guanajuato	0	0	7 men*	7	1 man 1 woman	6 men 1 woman	9
West Virginia University; University Autónoma Querétaro	1 man- Doctorate; 1 man Master's	1 man 3 women	16 men 14 women	36	1 man	0	1
<b>Totals</b>	<b>1 masters; 1 doctorate</b>	<b>16 masters</b>	<b>104**</b>	<b>122</b>	<b>62</b>	<b>768</b>	<b>830</b>

\* Diplomas awarded by Pennsylvania State University, not by Mexican Institution

\*\* 97 Diplomas were awarded at Mexican Institutions

*Training, INTERNSHIPS, Exchanges, Scholarships (TIES)*

Partnership internships included opportunities for Mexican students to take part in service learning activities that complemented formal study, research, or training at a U.S. institution and summer opportunities for both Mexican and U.S. students either in the United States or in Mexico. Through the partnership between ITESM-Querétaro and the University of Wisconsin-Madison, 17 internships were conducted on Wisconsin dairy farms providing the Mexican students with hands-on-experience in farm management practice, a thorough understanding of the dairy industry in the United States, and valuable training for future employment at Mexican industries eager to strengthen trade links. Additionally, nine research internships for Mexican students offered opportunities to collect and analyze first hand data that were not currently available at their home institution. These internships benefited both faculty and students since the research projects were able to move quickly with minimal faculty supervision because of the initial laboratory training. Students gained enthusiasm and insight into career opportunities in the dairy industry.

Twenty-seven Mexican students from the Universidad de Guadalajara and twelve U.S. students from the University of Notre Dame participated in summer internships designed as team projects to provide business advice and technical expertise to small and medium agricultural producers in Western Mexico growing avocados, varieties of peppers, fruit and fresh vegetables. The projects, identified by the Mexican professors, were ones found to be in need of change or adaptation to new market conditions created by NAFTA and globalization. Partners report that as a result of the summer internships, agricultural owners and managers have seen significant benefits in terms of helpful advice for business management and better business opportunities.

Summer internships for U.S. students were dependent on outside funds provided by the U.S. institution separate from TIES funding. The 12 students from Indiana and two students from Wisconsin participating in internships in Mexico were funded independently by the U.S. institutions themselves.

#### *Training, Internships, EXCHANGES, Scholarships (TIES)*

Exchanges benefited both Mexican and U.S. faculty and students. Faculty and staff exchanges provided a range of opportunities including short-term, but important, visits to the United States by Mexican higher education administrators. Mexican faculty participated in the delivery of joint workshops or seminars on technical subjects at the U.S. institutions, and often these faculty resided one or two semesters at the U.S. institution to conduct research, attend classes, prepare papers for submission to annual university publications, and become part of the TIES program working group. A total of 21 Mexican faculty took part in exchanges. U.S. faculty exchanges to Mexican institutions involved presentations of mini-courses as part of a new program, guest lectures within a new curriculum, joint planning for conference presentations, collaborative papers, and consultation on the overall TIES program. A total of 26 U.S. faculty took part in exchanges.

Student exchanges for Mexicans, originally intended to run for a full semester, also occurred as summer programs that included U.S. students. The University of Texas at Austin reported that the 15 exchanges for Mexican students provided opportunities not only to live and study in the United States, but also to visit non-governmental organizations that offered a comparison with those in Mexico enabling the students to gain various perspectives on their study of “civil society” as a result of exposure to a different cultural environment. Eight students from the University of Wisconsin-Madison benefitted from exchanges to Mexico with funding from leveraged contributions (See Table 4).

**Table 4.**  
**Human Capacity Building-Internships and Exchanges**  
Results of 8 TIES Partnerships

U.S. Institution Host Country Partner	Number of Mexican Faculty Exchanges to U.S.	Total Number of Mexican Faculty with Exchanges	Number of Mexican Student Exchanges to U.S.	Number of Mexican Students with Internships	Total Number of Mexican Students with Internships or Exchanges	Number of U.S. Faculty Exchanges to Mexico	Number of U.S. Student Exchanges to Mexico	Number of U.S. Student Internships in Mexico
University of New Mexico; University de Quintana Roo	2 men 1 woman	3	2 men		2	4 men 3 women		
University of Texas at Austin; Benemérita Univ. Autónoma de Puebla		-	5 men 10 women		15			
University of Wisconsin-Madison; ITESM-Querétaro		-	1 man 3 women	13 men 13 women	30	1 man	1 man 7 women	1 man 1 woman
Cornell University; University Autónoma de Yucatán	2 men	2	3 men	-	3	-	-	-
University of Georgia; University Veracruzana	1 man 2 women	3				4 men 3 women		
University of Notre Dame; University de Guadalajara	3 men 5 women	8	-	13 men 14 women	27	7 men	-	7 men 5 women
Pennsylvania State University; University de Guanajuato	4	4						1
West Virginia University; University Autónoma Querétaro	3 men	3				4 men		
<b>Totals</b>	23	23	24	53	77	26	8	14

*Training, Internships, Exchanges, SCHOLARSHIPS (TIES)*

Between 2003 and 2004, USAID stipulated that each TIES partnership include seven scholarships for Mexicans. In 2005 that request increased to ten. The eight U.S. universities in this study reported supporting 75 scholarships for at least two semesters each of graduate study for Mexican students in the United States resulting in:

- 1 doctorate,
- 17 master's degrees and seven graduate diplomas awarded by U.S. institutions,
- 52 *diplomados* from Mexican universities for Mexican students, and
- 45 certificates for completion of a new course introduced into an existing master's degree program.

West Virginia University chose to support Mexican students in Mexico and develop human capacity at one institution as a way to increase a critical mass of "know-how" in greenhouse technology to benefit small rural producers. In place of ten one-year scholarships for five students, the program produced 28 graduates in Mexico, each receiving classes on greenhouse technology based on local conditions of climate, water access, market opportunities, and challenges. Two additional students obtained graduate

degrees in the United States. The program succeeded in building critical human capacity to maintain a new program well beyond the duration of the project.

### *Human Capacity Building outside the Higher Education Institution*

While Mexican faculty and students acquired new knowledge and skills through classroom training, the ultimate beneficiaries from the TIES capacity building are members of Mexican society, residing “outside the walls” of the university. Table 5 shows the number of people trained through university extension and community outreach activities. Universidad de Quintana Roo and the University of New Mexico provided training in land use planning for sustainable development reaching local government officials in all but one of the municipalities in the state of Quintana Roo. Two of the eight partnerships demonstrated considerable impact at the farmer and small-scale producer level through university extension programs that involved workshops for rural citizens. Universidad de Guanajuato and Pennsylvania State University provided training and transfer of technology to 101 producer organizations and more than 200 agricultural producers, while the Universidad Autónoma de Querétaro and West Virginia University trained more than 200 small-scale producers through an annual workshop on greenhouse technology, offered regularly since 2006. This workshop has offered training to persons interested in small business development. The Universidad Autónoma de Querétaro has reached out to local entrepreneurs and families to maintain greenhouse operations instead of seeking employment opportunities outside the state or country. The partnership has had a verifiable social impact in a comparatively short period of time. A spillover effect to other states has been reported as a result of opening the annual workshops to participants from the states of Mexico, Guanajuato, Hidalgo, Nayarit, Oaxaca, Yucatán and Zacatecas. As the market for small rural greenhouses exists locally, regionally and internationally, the partnership has developed a successful model that can be replicated in other regions and countries.

Rapid appraisal of the constraints and opportunities for sheep-owning households (63) and beef cattle producers (60) in municipalities in Yucatán conducted by a Universidad Autónoma de Yucatán-Cornell research team with two Mexican faculty and two graduate students provided feedback and direction to the Mexican university for its role in future research and outreach to the local agricultural communities (See Table 5). Mexican faculty trained in the United States actively assisted local dairy producers and cheese manufacturers in Mexico with problem solving, and were invited by the Mexican government to offer presentations to low-income dairy producers at a sponsored conference. Technicians and employees of *Fundación Produce*, a local institution with representation throughout Mexico, received training from the partners in farm management and improved milk production and, in-turn, conducted small group training for other trainees. This “training of trainers” approach was adopted to benefit small-scale, subsistence dairy producers. The first ever workshop held in Querétaro on dairy sheep for *Fundación Produce* employees and current producers boosted the Mexican government program focused on increasing the number of dairy sheep producers as a way to generate more farm revenue.

Collaboration with local NGOs, such as the Centro Mexicana Para La Filantropía, Center for Mexican Philanthropy, enabled Benemérita Universidad Autónoma de Puebla and three other Mexican institutions to reach out to 1,733 participants and members of Mexican civil society organizations.

**Table 5.**  
**Quantitative and Qualitative Information: Training “Outside the Walls” of the University-Local Government and NGO Linkages, Extension and Community Outreach and Promotion of Workforce Development**  
Results of 8 TIES Partnerships

Partners	Local Government and NGO Linkages	Extension, Community Outreach including Training of Trainers	Promotion of Workforce Development
University of New Mexico; Universidad de Quintana Roo	<p><b>16 officials</b> from all but 1 of the <i>municipios</i> of state of Quintana Roo trained in land use planning for sustainable development.</p> <p><b>21 including 1 NGO representative, extension staff, 2 state and municipality agricultural officials.</b> Trained in participative decision making through facilitation and group process training.</p>	<p><b>12 participants:</b> Women (3 indigenous) trained around natural resource management</p> <p>13 participants. TOT participants trained in skills, knowledge, and attitudes about natural resources management</p>	<p>Partnership created network of coastal managers in Quinatana Roo.</p> <p>CEMIRN trained municipal administrators in the coastal zone</p>
University of Texas at Austin; Benemérita Universidad Autónoma	<p><b>5 Government Agencies; 18 NGOs</b></p> <p>Relationship developed with Centro Mexicana Para La Filantropia, Center for Mexican Philanthropy (CEMEFI). Four jointly organized international conferences convened for philanthropic, volunteer, and non-profit organizations from both sides of border held by CEMEFI. Title of second conference; <i>Sociedad Civil in Mexico: Identidad y retos en un etorno global (Civil Society In Mexico: Identity and Challenges in a Global World)</i>.</p> <p>Collaboration with Fundacion de la Benemérita Universidad Autónoma de Puebla, a nonprofit entity to support teaching, research, and cultural outreach activities.</p> <p>Connections made by Mexican faculty for visiting U.S. graduate students with Centro para al Foralecimiento de Organizaciones Civiles A.C. (Chihuahua City)</p> <p>FEMSA Foundation A.C. (Monterrey); Tosepan Titataniske (Puebla), Fundacion Comunitaria del Bajio A.C. (Irapuato), Huitzilcoatl (Puebla), Puente a la Salud Comunitaria (Oaxaca).</p> <p>Connections built by UTA with non-profit organizations to provide experiences for Mexican exchange students: El Buen Samaritano, Caritas Soup Kitchen, Mobile Loaves and Fishes, People’s Community clinic; Ballet Austin; Austin Children’s Shelter, Hands on Central Texas/Capital Area United Way Volunteer Center, Environmental Defense Fund, Capital Area Food Bank, Texas, Nonprofit Congress provided field experience for TIES exchange student studying at UTA; Dallas Foundation.</p>	<p>CEMEFI conferences: 710 men, 1,023 women participants</p> <p>Outreach activities conducted outside Puebla with Cholula Project and Sierra Norte Project</p> <p>Site visit to Consejo Puebla de Lectura, (a member of the International Reading Association) to promote learning through teaching, reading, and writing in the community</p> <p>Partnership offered training session in Puebla for “training the trainers”</p> <p>Training session in Puebla, opened to representatives from Mexican civil society organizations that could benefit from an increased knowledge base about civil society and its operations</p>	<p>NGO leaders in Mexico indicated frameworks introduced in executive education program immediately useful in improving social service programs.</p>

**Table 5.**  
**Quantitative and Qualitative Information: Training “Outside the Walls” of the University-Local Government and NGO Linkages, Extension and Community Outreach and Promotion of Workforce Development**  
Results of 8 TIES Partnerships

Partners	Local Government and NGO Linkages	Extension, Community Outreach including Training of Trainers	Promotion of Workforce Development
University of Wisconsin-Madison; ITESM-Querétaro		<p>8 men, 1 woman – One week training workshop in U.S. for employees of <i>Fundación Produce</i> in reproductive management, milk testing, mastitis, caring for fresh cows, managing high producing cows on pasture, farm bio-security/brucellosis and tuberculosis, best practices for calf care. Technicians trained will conduct one-on-one and small group training sessions for other <i>Fundación Produce</i> trainees who will conduct training sessions for small scale, subsistence dairy producers in Mexico.</p> <p>Summer professional development program resulted in implementation of outreach project that aided 26 low-income farmers in Querétaro State with organic fertilizer production, lamb meat production, and dairy production. 2 Mexican farms; U.S farms and dairy producers.</p>	Workshops on dairying conducted for Fundacion Produce and ALPURA employees resulted in better trained dairy industry employees.
Cornell University; Universidad Autónoma de Yucatán		<p>Rapid appraisal of constraints and opportunities for 63 sheep-owning households in 5 Yucatán locations.</p> <p>Rapid appraisal of 60 beef cattle production systems in Tizimín, Panabá, and Peto (Yucatán).</p> <p>Field laboratory taking students to Mexican communities and farms involves interactions with many farmers and professionals in Mexico’s agriculture and natural resources sector.</p>	<p>A skilled cadre of Mexican systems-oriented researchers and extension workers trained.</p> <p>Problem definition and appraisal resulted in better farm managers.</p>
University of Georgia; Universidad Veracruzana	<p>Mexican graduate students visited CBH International and DeKalb Farmers Market in Decatur, GA to learn about imports and exports between Mexico, South America and USA.</p> <p>Two Mexican faculty visited the Athens-Clarke County Public Library and Lyndon House Arts Center to broaden understandings of Mexican art and culture.</p>	<p>UV’s newly trained faculty working on an economic understanding of diversification and improvement of farmers’ income while protecting the environment; teaching nutrition to secondary level students and economics to government workers at the Secretariat of Finance and Planning of the State of Veracruz.</p> <p>Mexican graduates became program coordinators for the cross-cultural studies program for cooperative extension agents and specialists at the School for Foreign Students.</p> <p>Mexican rural schools received reference materials, art supplies, and teaching materials as result of faculty exchanges</p> <p>In U.S. one Mexican student was a mentor for Peach State Alliance for Minority Participation, a roundtable mentoring session with minority undergraduate students in STEM majors.</p> <p>A second Mexican student taught ESOL at Athens-Clarke County</p>	A cadre of Mexican graduate students trained with expertise to aid Mexican farmers and exporters and rural educators.

**Table 5.**  
**Quantitative and Qualitative Information: Training “Outside the Walls” of the University-Local Government**  
**and NGO Linkages, Extension and Community Outreach and Promotion of Workforce Development**  
 Results of 8 TIES Partnerships

Partners	Local Government and NGO Linkages	Extension, Community Outreach including Training of Trainers	Promotion of Workforce Development
		Public Library’s Community Learning Center in Pinewood Estates North and translated public healthcare outreach presentations at the Learn & Serve Hispanic Healthcare Pilot Program in Pinewood Estates	
University of Notre Dame; Universidad de Guadalajara		Small tomato producer gained comparative advantage through application of results of TIES project.	<p>Mexican graduate students trained in business economics obtained jobs in agribusiness with Mexican corporations.</p> <p>Mexican participants in program have training and motivation for developing or applying business plans for consulting or initiation of new ventures.</p> <p>Mexican faculty and graduate students trained in agribusiness better prepared to help small businesses.</p> <p>Small and medium-size agricultural producers whose projects were included in the TIES program improved their entrepreneurial and business skills.</p> <p>Mexican cooperative able to eliminate intermediaries and directly supply U.S. customers.</p>
Pennsylvania State University; Universidad de Guanajuato		<p><b>101 people trained in producer organizations.</b> Technologies transferred to producers of “La Puríssima” resulted in lower cost of production and increase in yield of sorghum.</p> <p><b>200 agricultural producers received training</b> under additional training contract from State Agriculture Department</p> <p>Bio-digesters and small horticultural farms for families own consumption adopted by disadvantaged people.</p> <p>Extension activities supported by SAGARPA (Federal Secretary of Agriculture) in several municipalities in Guanajuato State.</p> <p>Technical assistance on tomato production provided to group of 12 producers.</p> <p>4-H clubs established in 5-6 locations for youth development programs.</p>	<p>Mexican students acquired new techniques in applied research and extension program development.</p> <p>Graduates of new 4-H youth program are a spinoff of the TIES program</p> <p>Recruited students to participate in project with TIES to <b>support</b> grower organizations to ensure smooth transition into the workforce.</p> <p>Graduates of program are working as extensionists with producer organizations.</p> <p>Farmers, bankers, consultants trained on Spanish-language financial software programs for long-range financial planning</p>

**Table 5.**  
**Quantitative and Qualitative Information: Training “Outside the Walls” of the University-Local Government and NGO Linkages, Extension and Community Outreach and Promotion of Workforce Development**  
 Results of 8 TIES Partnerships

Partners	Local Government and NGO Linkages	Extension, Community Outreach including Training of Trainers	Promotion of Workforce Development
West Virginia University; Universidad Autónoma de Querétaro	Local agricultural groups have reached out to UAQ for advice in the approach to plan greenhouses in their own communities	<p><b>200 small –scale producers</b> attended workshop on greenhouse Technology community benefitting directly from workshops on greenhouse technology.</p> <p><b>5-6 small scale producers</b> have built greenhouse to operate under advice and interaction with researchers at UAQ.</p> <p>Several rural communities near Querétaro have organized to establish a greenhouse operation for the communities.</p> <p>Local entrepreneur assisted in establishing a successful greenhouse operation.</p> <p>Mexican students have returned to their communities and developed greenhouse operations.</p> <p>Greenhouse alliances formed with producers from other states (Oaxaca and Zacatecas) – groups from these states have come to Querétaro to receive training in operations of control systems for greenhouses.</p> <p>Group of engineering students from WVU’s Engineers Without Borders traveled to Querétaro and helped a rural family build a greenhouse.</p>	<p>Formation of a new “Extension Service” from UAQ, as a source of technical assistance for the community, will also promote trade.</p> <p>Groups of professionals created and trained in design, operation and management of greenhouse technology.</p> <p>Establishment of industrial greenhouse complexes has created jobs in the state.</p>

## *Institutional Capacity Strengthening*

The TIES partnership was designed as a public-private alliance to promote social and economic growth in Mexico through support to higher education institutions. This support included:

- faculty research collaboration;
- student research;
- research and joint teaching;
- new programs, curricula, and course work in Mexican institutions including laboratory and fieldwork;
- publications and conference presentations; and
- interaction with policy makers.

The university partnerships in this study often involved more than one-to-one relationships between a U.S. and a Mexican institution of higher education. They also included additional U.S. and Mexican university partners, professional associations, local governments, non-governmental associations, private individuals, and international organizations as a way to work toward institutional strengthening.

### *Faculty Research Collaboration*

Collaboration between U.S. and Mexican faculty and researchers is seen as a critical element in a program ultimately aimed at advising and influencing policy makers on issues related to national development goals. The partnership between the University of New Mexico and the Universidad de Quintana Roo started by recognizing the need for high quality applied scholarship and teaching in Southeast Mexico to inform critical ecological planning and policy research about natural resource planning and management. In a state that is vulnerable to hurricanes, there were no academic programs offering training in disaster response. The result of the research by the TIES university partners and their collaborators was a comprehensive plan to address disaster response that included state and national government agencies.

To investigate concepts for the design of technical and academic training for disaster mitigation, this innovative partnership research involved collaboration with the Coastal Resources Center at the University of Rhode Island, scholars from the University of California-San Luis Obispo, the Sistema Nacional de Prevención, Mitigación y Atención de Desastres Naturales in Nicaragua and a private research consultant in Costa Rica, as well as professional practitioners from seven municipalities in Quintana Roo. The direct result of the research was a proposal for a curriculum for disaster mitigation (*Bases para el manejo integral de desastres naturales e inducidos, propuesta de un diseño curricular para la formación de recursos humanos en Quintana Roo, México*). The proposal introduced a broad-based approach to disaster mitigation that focused on long-term effectiveness and recovery, and outlined a course of study for professional technical training and for academic teaching at the bachelor's, master's and doctoral degree levels. Seventy copies of the proposal were distributed to the eight municipal governments and their civil defense offices, and to various government agencies at the state and federal levels including the army and navy, the private sector, NGOs, and academics.

A second example of collaborative research involved engineers conducting research at the Universidad de Querétaro on technology automation for greenhouse operation with assistance from West Virginia University that resulted in production of a control system for heating, ventilation, lighting, and irrigation of greenhouse installations named TUNA (Technology, University, Automation) to enable small scale fruit and vegetable growers in Mexico to better treat and manage their produce. Research areas also included: food science and nutrients in greenhouse tomatoes versus open field tomatoes; tilapia farming under greenhouse environments; bull-frog farming; and growth of forage grass under greenhouse conditions. The experiment station, established at Amazcala, Querétaro, demonstrates the results of applied research on the use of greenhouse technology directly to potential producers, families, and communities.

Third, Mexican scholars took the lead in two collaborative research projects with University of Texas at Austin faculty on civil society development in Mexico. Nine Mexican scholars from Instituto Tecnológico y de Estudios Superiores de Monterrey - Ciudad de México (ITESM) and El Colegio Mexiquense presented their research on civil society issues in the Mexican context at a research symposium hosted by UTA organized jointly by the three participating institutions, Benemérita Universidad Autónoma de Puebla, Universidad de las Américas, El Colegio Mexiquense and ITESM – Mexico City. The scholars compiled this critical assessment of civil society in Mexico and recommendations for future directions into an edited publication published through El Colegio Mexiquense.

Fourth, Pennsylvania State University’s Center for Plasticulture at the College of Agricultural Sciences conducted a “hands-on” training program in the latest developments in plasticulture technology for Mexican researchers from Universidad de Guanajuato and the Agroplastics Department at el Centro de Investigación en Química Aplicada (CIQA) in Saltillo as part of their joint project to increase the production of local horticultural crops by small growers in Mexico. A collaborative research project and outreach/demonstration programs conducted on the farms of producers brought the research results directly to the people.

### *Student Research*

Master’s students conducted research as an integral part of their graduate training both in the United States and Mexico. Based on the findings of Mexican faculty on the resources, characteristics, and infrastructure of the farming communities surrounding Veracruz, the University of Georgia and the Universidad Veracruzana, through applied thesis research, jointly trained seven master’s students in order for them to assist Mexican farmers and exporters. This multi-disciplinary research has contributed to:

- better understanding of agricultural diversification for small-scale farmers in Zozocolo, Veracruz State,
- analysis of the economic potential of the lime oil industry in Mexico,
- better understanding of the requirement for poultry exports to the U.S., and
- improved knowledge about the nutritional value of staple items in the Mexican diet.

Five Mexican graduate students collaborated on a summer research project about the growth and yield of peppers and tomatoes at Pennsylvania State University designed to offer “real world” experience around project design and management. The knowledge and experience enabled the students to develop a new university extension program in the state of Guanajuato to assist small growers in Mexico with technological applications for production agriculture. Graduates of the program are now working as extension agents with producer organizations and providing training and technical assistance about hydroponics, green house production, extension techniques, and plasticulture.

University of Notre Dame students joined Mexican MBA students in five summer internship projects that included applied research on:

- a honey products operation in Tonalá, Jalisco;
- market and business analysis of a small tequila distillery processing plant in Ixtlán, Colima;
- medium sized strawberry processing plant in Zamora, Michoacán, mango processing and packaging plant in Mazatlan, Sinaloa; and
- small-scale production of tomatoes in Ameca, Jalisco.

Three Mexican master’s theses projects at Cornell focused on cattle systems in Veracruz and Yucatán. The students worked together with farmers and farmer organizations who were collaborators in the studies. Two additional theses projects by Cornell graduate students also focused on beef cattle systems and crop-livestock systems in Yucatán adding to the information available to farmers, farmer cooperatives, the *Grupo Ganadero de Validación y Transferencia de Tecnología*, and the state organization, *Fundación Produce*. One result of the research has been institutional funding for at least three new research projects attributed partly to the participation of the Universidad Autónoma de Yucatán in the TIES partnership.

#### *Research and Joint Teaching*

The Universidad Autónoma de Yucatán and Cornell University introduced a program designed to integrate research, teaching, and communication among collaborating institutions including the Universidad Veracruzana, the Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias (INIFAP) -Veracruz, and El Colegio de Posgraduados, Campus Cárdenas. Thesis research by five students at Cornell (3 Mexican students and 2 other students) contributed to the establishment of a “research platform” for the TIES project. Visiting faculty from Mexico consulted with Cornell faculty about future collaborative research between U.S. and Mexican institutions on ruminant nutrition. Consequently, research proposals directly related to the theme of the TIES rural development project have since received funding. Information obtained through the research is expected to enrich teaching at all the collaborating institutions.

Short courses introduced into the curriculum at the Universidad Autónoma de Yucatán with support from Cornell University provided academic professionals and graduate students at partner institutions with new knowledge and perspectives on livestock production. The partners developed five core courses taught jointly during the TIES project and utilized Internet technology to link faculty and students through

videoconferencing and follow up to joint fieldwork. Web sites were established to serve a multi-disciplinary audience of international students, provide an information clearinghouse to support the collaboration, and inform other interested parties. The video-recordings of the five short-courses are a substantial learning resource for students and faculty at both Mexican and U.S. institutions.

Three returning Mexican students with master's degrees in agribusiness and economics from the University of Georgia were employed by the Universidad Veracruzana to teach new undergraduate and graduate level courses in economic geography and agribusiness in the School of Business and the department of economics. A new agribusiness master's program is reported by Universidad Veracruzana as a direct result of the teaching and curriculum development contributions of one returned TIES student. As a result of the teaching and curriculum development contributions from two other TIES students, two new master's degrees in ecological economics and microfinance are being developed in 2010 in the department of economics. With only three other programs in Mexico currently offering ecological economics, the Universidad Veracruzana will serve a broad area of Xalapa and the central and southern regions of Mexico.

#### *New Programs, Curricula, and Courses in Mexican Institutions*

TIES partners have assisted in the growth and development of new graduate programs such as the Programa Postgraduado de Planeación (PPP) at the Universidad de Quintana Roo that are designed to educate future natural resource planners, facilitate community-based decision making for the management of natural resources and economic development, and generate research-based scholarship to inform policy decisions. The University of New Mexico and the Universidad de Quintana Roo collaborated on the development of the new program that was approved by the governing body of the Universidad de Quintana Roo at the beginning of the TIES project.

The University of New Mexico provided training for two new faculty members, workshops for community decision makers, and support for the new program through the purchase of books, software, and equipment. The partnership laid the groundwork for the Universidad de Quintana Roo to provide future graduate education and professional training in natural resource planning and management. The program is now in its fourth cohort with an enrollment of eight students. UQROO's program is the only one of its kind in this part of Mexico, and is attracting students from outside the country. UQROO applied for and received CONACyT recognition in 2008 for the PPP program as a "Program of Quality" (Programa de Calidad). The UQROO PPP will have this designation until 2013, when it is re-evaluated. CONACyT recognition is a critical step for academic programs in Mexico to gain external validation and funding.

Training for Mexican faculty in the United States in agribusiness resulted in increased capacity of the University of Guadalajara to offer a new undergraduate program in agribusiness that was introduced in 2008, and now has nearly 1,800 students. Notre Dame faculty initially taught mini-courses in a new certificate program that graduated forty-five Mexican students with a certificate in agribusiness and entrepreneurship during the partnership. Faculty training enabled the Mexican university to offer the new bachelor's degree in agribusiness, which is seen as a direct result of the business courses developed by

U.S. faculty from the University of Notre Dame serving as guest lecturers during summer programs in Mexico.

Two former TIES student participants in the internship program organized by the University of Notre Dame and Universidad de Guadalajara are leading the establishment of a Small Business Development Center (SBDC) at the university. The Center is directed by the two former graduate students and reflects their training from the University of Notre Dame resulting from the TIES internship program that assisted small scale producers in the state. The Center has adopted the methodology introduced by the U.S. university and is currently providing business consultation to ten small businesses which, to date, have created 27 jobs.

### *Curriculum Development*

Six graduate level programs were created by the Benemérita Universidad Autónoma de Puebla together with their partners, ITESM-Campus Ciudad de Mexico, Universidad de las Américas, Puebla, El Colegio Mexiquense in Toluca, and the University of Texas at Austin. A curriculum development and research workshop was conducted in Texas for the Mexican institutions, and an international joint workshop with a focus on developing curricula to be implemented by the Mexican institutions was presented in Puebla to provide momentum for the project. The University of Guanajuato launched a new agribusiness curriculum designed with the assistance of the Pennsylvania State University. U.S. faculty from Pennsylvania State University assisted in the design of the new curriculum and served as guest lecturers in the program. One graduate student from the Mexican university participated in a one year program at Pennsylvania State University, then went on to receive a scholarship to study food marketing for six months at St. Joseph's University in Philadelphia. When she returned to Guanajuato she worked with the Coordinator of Extension and Partnerships, Irapuato Campus, to establish the Agribusiness BA within eight months of her return. She is now the Coordinator of the Agribusiness Program. Ninety-five students are currently enrolled in the agribusiness undergraduate degree program.

The customized training provided by the University of Wisconsin-Madison for faculty of ITESM-Querétaro resulted in improved or expanded curricula in the areas of food cooperatives, laboratory techniques, food science, meat processing, and greenhouse management. One returning faculty member introduced the concept of cooperatives into the agribusiness management course and planned to organize new outreach projects for his students to aid low-income farmers in Querétaro state. A second faculty member provided a workshop for 30 trainees from different universities in Mexico about cheese manufacturing from extended milk based on his experiments conducted in Wisconsin. New problem-based learning scenarios were implemented for dairy technology classes, and new service learning outreach activities were developed for students. Faculty also obtained knowledge about the kind of laboratory equipment most beneficial for students and the low-income communities where they will work as part of the university outreach activities. The Mexican faculty members were also able to design new research instruments to use in classes based on models seen in laboratories in the U.S. institution.

### *Publications and Conference Presentations*

A major indicator of higher education institutional strengthening is the number of publications per faculty member in peer-reviewed journals, often seen as a measure of research output that increases the reputation of the institution. Valuable publications come in many formats and also are categorized as doctoral dissertations, theses, books, reports, and articles for the general public. Not only research findings in journals, but also papers presented at national and international conferences provide recognition of institutional productivity. For the TIES program, collaborative research leading to academic papers was one of the partnership components. Other evidence of institutional strengthening included general publications, conference presentations, articles, presentations about international project management, and reports covering master's level research related to Mexico's national development goals.

Of the seven Mexican graduate students from Universidad Veracruzana who received master's degrees from the University of Georgia, four have published papers related to their applied thesis research, or have made presentations at professional conferences in the United States and Mexico on topics related to agriculture diversification, U.S. demand for Mexican food products, and agricultural trade with Mexico. Four of the graduates are currently pursuing doctoral work in their respective fields. Two are simultaneously continuing to teach at Universidad Veracruzana, and one is pursuing his doctorate in the United States in sustainable rural development with plans to continue working with rural Mexican communities.

The Center for Tropical Research and Investigation (CITRO) at the Universidad Veracruzana plans to publish a handbook about how to build a strategy for rural diversification with contributions from one of the TIES scholars about economic diversification for coffee producers. Research reports by two of the TIES scholars have been shared at conferences in China and Nicaragua.

Research results have provided empirical evidence on the value of biodiversity in the Yucatán region of Mexico. The three master's theses on cattle production in the Gulf region by graduate students from the Universidad Autónoma de Yucatán and Universidad Veracruzana are now available to faculty and students on the web platform established by Cornell University. Research results have been shared with the farmers, farmer cooperatives, the *Grupo Ganadero de Validación y Transferencia de Tecnología*, and state government organizations such as *Fundación Produce*. A number of articles about the program have been published in *Por Esto!* a Merida newspaper. Two newspaper stories were about the farmer field days in Tizimin for more than 250 participants that included invited presentations by two of the Cornell graduates on issues directly related to the concerns of the farmers.

A total of six research reports by visiting researchers and graduate students from the Universidad Autónoma de Querétaro have been published in peer-reviewed journals since 2005. The field research conducted in Mexico resulted in completion of a doctoral thesis in Mexico and two master's theses at West Virginia University relating to the production of niche products in Mexico for small producers such as tomatoes, that do not compete with "commodity" products. The 28 Mexican graduate students, who specialized in greenhouse technology with thesis support from West Virginia University faculty have

produced project reports that directly relate to local conditions by focusing on climate, access to water, and market variability affecting small-scale producers in the region.

Five MBA students from the University of Guadalajara, who participated in joint internships with U.S. students from the University of Notre Dame assisting small-scale agricultural producers in Mexico, later completed master's theses in the agricultural sector as a result of the internship work. Additional funds from the Kellogg Center supported one Mexican professor's work to publish a paper on "Small Scale Entrepreneurs in Mexico" while on an exchange visit to Notre Dame. The TIES co-directors participated in an international conference in Bolzano, Italy, and presented a paper on the TIES partnership as a case study. A revised version of the paper was presented at the annual conference of the Latin American Studies Association in Lima, Peru. The TIES co-directors also delivered papers at a national conference on international studies and student mobility in Mexico, and published an article in the journal "Educación Global" of the Asociación Mexicana para la Educación Internacional. Similarly, they published a brief report in the Notre Dame Business Magazine.

The Benemérita Universidad Autónoma de Puebla (BUAP) and the University of Texas at Austin, organized joint international research conferences in Mexico and in Texas on research and curriculum development for the new discipline of civil society studies being designed at the four collaborating institutions: BUAP, El Colegio Mexiquense, Instituto Tecnológico y de Estudios Superiores de Monterrey (Tec de Monterrey), Mexico City and Universidad de las Americas in Puebla. The four Mexican institutions were involved in four annual international conferences in Mexico hosted by the Center for Philanthropy, three of the conferences were sponsored by the University of Texas at Austin. Collaborative research on civil society was presented at a research symposium in Texas with papers given by the two lead researchers from Mexico. These research conferences elicited papers with the goal of publishing the results in a book on Mexican civil society issues. The book is comprised of 25 articles focusing on the progress of democracy and the development of civil society. This publication is a direct outgrowth of a TIES short course given in 2006, by BUAP and Colegio Mexiquense. The book is in the final stages of editing and will be published with the support of the faculty of administration.

Reports on applied work accomplished through the TIES partnerships have been presented to state and local governments, producer groups, and NGOs in both Mexico and the United States. Universidad de Quintana Roo presented copies of a new curriculum for capacity building in disaster mitigation to eight municipal governments, civil defense offices, state and federal governments, the army and navy, NGOs, and the private sector. The curriculum covers a variety of training models and complexity of materials and emphasizes a wide examination of issues including reconstruction and redevelopment. The University of Wisconsin-Madison, gave a presentation on "Good Practices for Dairy Herd Management to 34 low-income dairy producers at a conference organized and supported by the Mexican government. Penn State University made a presentation to the Pennsylvania chapter of Epsilon Sigma Phi, an extension fraternity to inform more than 70 extension educators about how the 4-H program is being developed in Guanajuato.

### *Interaction with Policy Makers*

USAID has identified effects on policy as one of the highest levels of evidence of higher education capacity building. Even from this small sample of eight partnerships, examples were found regarding effects on policy. As a result of TIES partnerships, Mexican partners reported establishing formal ties with key government agencies; they described ministry participation in community decision-making sessions; they noted government agency participation in critical conferences; and they described student involvement in the drafting of strategic development plans. The University of New Mexico and Universidad de Quintana Roo sponsored a week-long training course on natural resources planning and management for government officials from 16 municipalities in the state of Quintana Roo. The course included lectures, field visits and team projects and open discussion related to public policy and execution of civic projects. It was designed to increase the capacity of the state's natural resource planners. Topics included rapid appraisal techniques for social and economic analysis, program planning and evaluation, analysis of socio-environmental impacts, challenges and opportunities for sustainable tourism and GIS (Geographical Information Systems) applications for environmental social impact assessment.

Courses designed to facilitate community based decision making for management of natural resources planning related to economic development focused on members of the Quintana Roo government and non-profit community including officials from the state office of the Secretaría de Desarrollo Agrícola, Regional e Indígena (SEDARI) and the municipality of Othon Blanco.

The results of collaborative research by the implementing partners on needed technical and academic training for disaster mitigation for the state of Quintana Roo, a region prone to hurricanes, culminated in dissemination of a proposed curriculum that was distributed to the eight municipal governments in the state of Quintana Roo, their civil defense offices, and government agencies at the state and federal levels. Site visit reports indicate that the level of outreach and communication with policy makers that took place during the period of partnership funding has not been sustained by the Mexican institution, although the University of Quintana Roo is now working hard to revive the relationship with the University of New Mexico.

Pennsylvania State University and its Mexican partner made a concerted effort to meet with elected officials during the period of partnership funding to strengthen the links and friendly relationships between the university and government agencies as a way to increase the likelihood of future collaboration. Universidad de Guanajuato has been able to build on these efforts and secure funding for field training from the state Department of Agriculture (Secretaría de Desarrollo Agropecuario), the Ministry of Agriculture, Livestock, Rural Development, Fishing and Food (SAGARPA) and the municipalities of Salamanca, Abasolo, and Irapuato. The university has been a pioneer in extension work, public service, and outreach and is now the lead institution in the region with state support for extension activities and development of 4-H programs.

The University of Texas at Austin and Benemérita Universidad Autónoma de Puebla established formal links with government agencies and partnership activities that led to a conference on civil society co-sponsored by several Mexican government agencies. The goal of the conference, "Civil Society in

Mexico: Identity and Challenges in a Global World,” was to encourage Mexican governmental organizations to broaden their perspectives on civil society in Mexico. Table 6 outlines specific responses from partnership managers related to institutional capacity strengthening.



HED photos



Tiny painted footprints lead visitors to a children's reading corner, or "bebeteca," at the Consejo Puebla de Lectura, A.C., an NGO serving a low-income Puebla, Mexico community as a library and reading center. The Center is headed by a faculty member from the Universidad Autónoma Benemérita de Puebla (BUAP) and is supported by student and community volunteers.



Left to Right: Alma Carrasco Altamirano, director of Consejo Puebla de Lectura, A.C. and Gema Jiménez, Participant Training Specialist at USAID/Mexico stand at the entrance of the Center's children's reading corner, or "bebeteca." As of 2009-2010, there are nine bebetecas in Puebla.

**Table 6.**  
**Institutional Capacity Strengthening--Quantitative and Qualitative Results**  
Results of 8 TIES Partnerships

Partners	Number of New/Improved Programs, Curricula, Teaching Methods, Courses, Classes Taught	Number of Interactions with Policy Makers	Number of Collaborative Research Projects	Number of Publications and Presentations
<p>University of New Mexico (UNM); Universidad de Quintana Roo (UQRoo), Coastal Resources Center, University of Rhode Island</p>	<ol style="list-style-type: none"> <li>1. Joint development of new program of study for 1 new master's degree: "Programa Postgrado de Planeacion" and application for CONACyT recognition.</li> <li>2. Proposed Associate Degree: Diplomado en Planeaci3n.</li> <li>3. TIES scholarship recipient received a master's degree and joined the faculty of UQRoo to teach graduate and undergraduate courses in natural resources planning and management.</li> <li>4. Nine UQRoo faculty participated in two-day skills training workshop that related directly to classroom teaching.</li> <li>5. Academic committee acquired 40 titles for library on geography planning and environmental management.</li> <li>6. Summer 2002 joint field course with combined focus on planning (for U.S. students) and environmental engineering (for Mexican students).</li> </ol>	<ol style="list-style-type: none"> <li>1. The partners sponsored week-long training source on natural resources planning and management for government officials from 16 municipalities in the state of Quintana Roo. Course included open discussion related to public policy and execution of civic projects.</li> <li>2. Courses designed to facilitate community based decision making in the region for management of natural resources planning for government and non-profit community including officials from the state office of the Secretar3a de Desarrollo Agr3cola, Regional e Ind3gena (SEDARI) and the municipality of Othon Blanco.</li> </ol>	<ol style="list-style-type: none"> <li>1. Collaboration on the curriculum proposal for disaster mitigation among UQRoo, California Polytechnic State University, and University of New Mexico and private consultant on disaster mitigation in Costa Rica and the <i>Sistema Nacional de Prevenci3n, Mitigaci3n, y Atenci3n de Desastres</i>, (SESINAPRED) de Nicaragua.</li> <li>2. Research conducted to examine national parks and recreational tourism as an economic development alternative.</li> </ol>	<ol style="list-style-type: none"> <li>1. Seventy copies distributed in CD format of Proposal of Curriculum for Disaster Mitigation, to 8 municipal governments, and civil defense offices, various Mexican government agencies at state and federal levels, including army and navy, NGOs and private sector, October 2006. Emphasizes a wider examination of issues and offers proposal for establishing capacity building from one-time trainings through doctorate level.</li> </ol>
<p>University of Texas at Austin (UTA); Benem3rita Universidad Aut3noma de Puebla (BUAP) El Colegio Mexiquense and ITESM-Campus Cuidad de M3xico</p>	<ol style="list-style-type: none"> <li>1. Created framework for future international collaborative efforts such as Civil Society Summer Institute, Mexico created with UTA institutional funds and a grant from U.S. Department of Education and grant from ACE for Capacity Building in Mexico through Social Innovation and NGO Leadership Training, \$85,565 grant awarded 2008</li> <li>2. Provided support for development and recognition of new discipline of civil society studies through: Curriculum development workshop involving representatives from BUAP, ITESM, UDLA.</li> </ol>	<ol style="list-style-type: none"> <li>1. Five formal links established with government agencies.</li> <li>2. Partnership involved in research consultations, observation, and direct assistance for water resources in Mexico and the role on nongovernmental and civil society organizations.</li> <li>3. Partnership Civil Society Conference in 2004 co-sponsored by several Mexican governmental agencies. Representatives of those agencies were involved in research panels and presentations on a variety of issues concerning civil society in Mexico titled "Sociedad civil en Mexico:</li> </ol>	<ol style="list-style-type: none"> <li>1. Fifteen projects for the Trilateral Research Consortium.</li> <li>2. Research projects led by Mexican University scholars: "Mexican CSOs in a New Democratic Environment, Dr. Alejandro Natal. "Accountability and Transparency in Mexican Civil Society Organizations," Dr. Alberto Hern3ndez.</li> <li>3. Research to address various development problems, including the issue of Mexican water resources.</li> <li>4. One TIES student conducted research in the area of volunteerism in Mexican civil society.</li> </ol>	<ol style="list-style-type: none"> <li>1. Nine Mexican scholars from ITESM and <i>El Colegio Mexiquense</i> presented their research on civil society issues at 2week long symposium at University of Texas, fall 2006.</li> <li>2. Partners involved in 4 international conferences held by <i>Centro Mexicana para la Filantrop3a</i> (CEMEFI).</li> <li>3. Dr. Alberto Hern3ndez of ITESM presented research on NGOs, AIDS and Ethics and conference in Mexico, 2006.</li> </ol>

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Partners	Number of New/Improved Programs, Curricula, Teaching Methods, Courses, Classes Taught	Number of Interactions with Policy Makers	Number of Collaborative Research Projects	Number of Publications and Presentations
<p>University of Texas at Austin (UTA); Benemérita Universidad Autónoma de Puebla (BUAP) El Colegio Mexiquense and ITESM-Campus Ciudad de México</p>	<ol style="list-style-type: none"> <li>3. Intensive faculty training at joint workshop in Puebla, 2005 and Austin, 2006 with focus on developing curriculum and research to be implemented in Mexican institutions.</li> <li>4. Incorporated civil society studies into the curricula at BUAP.</li> <li>5. ITESM collaborated with CEMEFI on a program to bring speakers and visiting scholars to campus and created program of support for professors and students to study, conduct research and publish.</li> <li>6. <i>El Colegio Mexiquense</i> created a formal seminar for interested students involving research on a civil society project and as a selection tool for exchange program.</li> <li>7. BUAP committed own funds to send 4 students to Summer Civil Society Institute.</li> <li>8. Curriculum developed for philanthropy, volunteerism, nonprofit management, and civil society.</li> <li>9. 30 books on civil society received by <i>Colegio Mexiquense from UTA</i> to support faculty development and build collection.</li> </ol>	<p>identidad y retos en un entorno global” (Civil Society In Mexico: Identity and Challenges in a Global World). Goal of conference was to encourage Mexican governmental organizations to broaden perspectives about civil society organizations in Mexico and apply them in local communities.</p>		<ol style="list-style-type: none"> <li>4. RGK Center faculty co-hosted a panel on Philanthropy and Civil Society as part of the UT Austin delegation of scholars to a five-day conference in Mexico City on the future of North America.</li> <li>5. Book of 25 articles focusing on development of civil society to be published on work presented at Fall 2006 Research Symposium to be published in Mexico through BUAP and <i>El Colegio Mexiquense</i>.</li> </ol>
<p>University of Wisconsin-Madison (UWM); ITESM-Querétaro</p>	<ol style="list-style-type: none"> <li>1. Faculty training resulted in improved new courses for students; e.g., cooperatives concepts on development and operation incorporated into Agribusiness Management course. Course now includes new outreach projects in which the professor and his students will aid low-income farmers in Querétaro State.</li> <li>2. One professor was invited to teach hands-on workshop for 30 trainees from different universities.</li> </ol>		<ol style="list-style-type: none"> <li>1. Collaborative research to determine microbiological difference in three leading cheese types from three Hispanic regions as compared to their U.S. counterparts.</li> <li>2. Research conducted on the use of whey.</li> <li>3. Project focusing on milk quality and composition of feeding.</li> </ol>	<ol style="list-style-type: none"> <li>1. Presentation on Good Practices for Dairy Herd Management to 34 low-income dairy producers at conference organized and supported by Mexican government.</li> </ol>

**Table 6.**  
**Institutional Capacity Strengthening--Quantitative and Qualitative Results**  
Results of 8 TIES Partnerships

Partners	Number of New/Improved Programs, Curricula, Teaching Methods, Courses, Classes Taught	Number of Interactions with Policy Makers	Number of Collaborative Research Projects	Number of Publications and Presentations
University of Wisconsin-Madison (UWM); ITESM-Querétaro	<ol style="list-style-type: none"> <li>3. Two new lab sessions on cheddaring incorporated into Dairy Technology laboratory course. New problem-based learning scenario introduced into the Dairy Technology class that deals with one of the problems faced by pasture-fed cows in dairy cream production.</li> <li>4. Training in greenhouse management incorporated into greenhouse course.</li> <li>5. Training enabled evaluation and selection of appropriate new laboratory equipment for use inside and outside the classroom.</li> <li>6. "Series Analysis Efficiency" introduced into Animal Nutrition Workshop using instruments designed based on models used in laboratories in Wisconsin.</li> <li>7. Partnership developed educational materials to improve the knowledge base of Mexican dairy workers.</li> <li>8. Improved training materials for dairy workers.</li> </ol>			
Cornell University (CU); Universidad Autónoma de Yucatán and Universidad Veracruzana (UV)	<ol style="list-style-type: none"> <li>1. Five new short courses introduced on a variety of subjects provide new knowledge and perspectives on ruminant livestock industry. Courses recorded for use by faculty and students.</li> <li>2. Internet-based platform created for integrating teaching and research. Two video-conference joint courses on key Mexican rural development issues taught for students from three institutions.</li> <li>3. Two "living laboratory" field courses conducted in Mexico accompanied by a video-conference component.</li> </ol>		<ol style="list-style-type: none"> <li>1. Five research theses available via web to enrich teaching and research and help to develop practical recommendations for farmers and their advisers.</li> <li>2. Rapid appraisal of 63 sheep-owning - households in five locations in Yucatán.</li> <li>3. Rapid appraisal of 60 beef production systems in eastern and southern Yucatán.</li> <li>4. Community-based research project on micro-watershed management in the cattle lands that dominate the coastal plain of Veracruz.</li> <li>5. Research to develop systems model of Yucatán sheep production and marketing.</li> </ol>	<ol style="list-style-type: none"> <li>1. Twenty presentations by TIES project collaborators addressing Mexican issue and priority themes for Gulf region of Mexico, 2005-2006. Examples:  <ul style="list-style-type: none"> <li>- Agriculture and Development in the Mexican Tropics</li> <li>- Livestock in Development</li> <li>- Maya Households: Domestic archaeology and ethno archaeology</li> <li>- Effects on plants and animals</li> <li>- Agriculture and Food Systems in Veracruz</li> <li>- Decision support of livestock systems in the Gulf Region</li> </ul> </li> </ol>

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**Institutional Capacity Strengthening--Quantitative and Qualitative Results**  
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Partners	Number of New/Improved Programs, Curricula, Teaching Methods, Courses, Classes Taught	Number of Interactions with Policy Makers	Number of Collaborative Research Projects	Number of Publications and Presentations
Cornell University (CU); Universidad Autónoma de Yucatán and Universidad Veracruzana (UV)	<ol style="list-style-type: none"> <li>4. An archive of print and electronic learning materials developed.</li> <li>5. Enhanced understanding of methods and technologies for collaborative research and instruction.</li> </ol>			<ul style="list-style-type: none"> <li>- Living Laboratory/ Joint Teaching Experiment</li> <li>2. Two Veracruz students presented their Master's thesis projects to collaborating farmer organizations in seminars at Universidad Veracruzana—one student successfully obtained CONACyT funding to pursue a doctoral degree.</li> <li>3. Invitation extended to U.S. scientist to return to Yucatán to present research findings at a farmer field day sponsored by INIFAP.</li> </ul>
University of Georgia (UGA); Universidad Veracruzana (UV)	<ol style="list-style-type: none"> <li>1. Four UV students who received master's degrees in agricultural economics (2), food science and technology (1) and housing and consumer economics (1) are teaching undergraduate and graduate courses at the university.</li> <li>2. One TIES student is teaching at the University of Chiapas.</li> <li>3. Consultation took place between UGA and UV faculty on service learning.</li> <li>4. Continued partnership and collaboration between UV and UGA - faculty have presented series of lectures on improved instructional technology as part of continuation of faculty exchanges.</li> </ol>		<ol style="list-style-type: none"> <li>1. Thesis research by 7 Mexican graduate students relevant to Mexican development goals of increasing competitiveness in the rural sector in agriculture and education.</li> </ol>	<ol style="list-style-type: none"> <li>1. A TIES graduate student in Housing and Consumer Economics, presented a paper with UGA faculty at the AAEEA conference and submitted it to the AAEEA selected papers competition entitled "An Analysis of the Hispanic Consumers' Demand for Food Eaten Away from Home"</li> <li>2. The same student prepared a paper for the WAEA meetings entitled "U.S. Hispanic Consumers Demand for Meat: A Comparative Analysis by Region of Origin"</li> <li>3. Two Mexican TIES graduate students and UGA faculty presented papers on coffee farming and demand for Mexican limes at the 11th Annual Conference on the Americas held at Georgia Perimeter College in 2008.</li> </ol>

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**Institutional Capacity Strengthening--Quantitative and Qualitative Results**  
Results of 8 TIES Partnerships

Partners	Number of New/Improved Programs, Curricula, Teaching Methods, Courses, Classes Taught	Number of Interactions with Policy Makers	Number of Collaborative Research Projects	Number of Publications and Presentations
University of Georgia (UGA); Universidad Veracruzana (UV)				<ol style="list-style-type: none"> <li>4. Two Mexican TIES graduate students presented papers at the Food Distribution Research Society Annual meetings in 2005 and 2007.</li> <li>5. One Mexican TIES graduate student presented a paper at the 10<sup>th</sup> Conference of the Americas, 2007 and one other presented her research at the Institute of Food Technologists in 2007.</li> <li>6. One student presented a paper at the 6<sup>th</sup> Annual Georgia Graduate Student Interdisciplinary Conference in 2007 and had an abstract selected for the Poster Session at the IFT Annual Meeting in Chicago, 2007.</li> <li>7. The TIES director from UGA gave 3 presentations related to the TIES project between 2005 and 2007.</li> </ol>
University of Notre Dame (UND); Universidad de Guadalajara (UG)	<ol style="list-style-type: none"> <li>1. Mexican faculty trained in Entrepreneurship, Teaching Methodology and Class Management. All are involved in graduate teaching.</li> <li>2. New <i>diplomado</i> in agribusiness, entrepreneurship and small business development established as part of MBA program in UG's Center for business and Economic Studies (CUCEA) intended for Mexican professionals, training them to become managers, consultants, researchers in Mexico's rural sector.</li> <li>3. UG introduced a new bachelor's degree in entrepreneurship.</li> </ol>		<ol style="list-style-type: none"> <li>1. Five small joint research projects carried out by groups of interns.</li> </ol>	<ol style="list-style-type: none"> <li>1. Paper prepared as a case study on the experience of doing cooperative educational program by co-directors of the TIES program, at international conference in Italy and at annual conference of Business Association of Latin American Studies (BALAS) in Lima, Peru.</li> <li>2. UG faculty member prepared paper from her direct participation in one of the TIES agricultural projects in collaboration with Prof. Jack Ruhe from St. Mary's College- presented at a meeting in Guadalajara July 2006</li> </ol>

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University of Notre Dame (UND); Universidad de Guadalajara (UG)	4. A new university unit established on the Guadalajara campus to continue the activities started by TIES.			3. Paper presented at Kellogg Institute for International Studies titled "The Supermarket Revolution in Developing Countries: Development Implications"
Pennsylvania State University (PSU); Universidad de Guanajuato (UG) El Centro de Investigación en Química Aplicada (CIQA)	<ol style="list-style-type: none"> <li>1. Agribusiness and English courses have become part of the curriculum.</li> <li>2. Language laboratory to teach English set up and English courses now a curriculum requisite.</li> <li>3. New curriculum for extension education for agriculture specialists for a BSc in Agribusiness developed with support from PSU.</li> <li>4. Textbook translated into Spanish for use at UG.</li> <li>5. ICA greenhouse installed and operated with help of students for tomato growing.</li> <li>6. Extension activities developed by ICA faculties and students in several municipalities of Guanajuato State.</li> <li>7. 4-H youth development initiative with the Institute of Agriculture, UG established.</li> <li>8. Technical assistance provided to producers to improve crop production</li> </ol>	1. Met with elected officials, including mayors of the city of Guanajuato, Salamanca and Irapuato to promote extension as an important investment for development for rural producers and disadvantaged rural communities.	<ol style="list-style-type: none"> <li>1. Applied research in horticulture and plastics: "The Effect of Different Colored Mulches on Growth and Yield of Peppers and Tomatoes" carried out by Mexican graduate students in the United States.</li> <li>2. Five different applied projects started in 15 rural communities in Mexico.</li> </ol>	1. Presentation made to the Epsilon Sigma Phi Pennsylvania Chapter, an Extension Fraternity, to inform 70 extension educators on how the 4-H program is being developed in Guanajuato.
West Virginia University (WVU) Universidad de Querétaro (UAQ)	<ol style="list-style-type: none"> <li>1. Two new programs created. The Graduate Program in Greenhouse Technology leading to master's degree in Engineering with a specialty in greenhouse technology and the associate degree at the undergraduate level in leading to a Diploma in Greenhouse technology.</li> <li>2. Improved curriculum of the Master's degree in greenhouse technology to</li> </ol>		<ol style="list-style-type: none"> <li>1. Research conducted by faculty from UAQ and WVU on the development of technology automation for greenhouse operations to aid small rural producers produced an automation system (TUNA) Amazcala Greenhouse Complex is experimental station and a producing greenhouse complex.</li> <li>2. UAQ student at WVU conducted research on hydroponics production in lava rock.</li> </ol>	<ol style="list-style-type: none"> <li>1. "Handbook for Best Practices in Greenhouse Operation"</li> <li>2. "Manual for Greenhouse Production of Tomato"</li> <li>3. "Manual for Design, Construction, Operation and Management for Greenhouse for Small Rural Producers"</li> </ol>

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West Virginia University (WVU) Universidad de Querétaro (UAQ)	include graduate students' research projects. 3. Internet and distance education technology integrated into curriculum 4. Practical, experience-based approach to teaching promoted; e.g., one credit course initiated in which where WVU and Mexican students collaborate to build greenhouses in rural Mexico		3. Partners designed and presented a "Diagnóstico" highlighting research, teaching, outreach, business, organizational, and environmental strengths and weaknesses of the UAQ greenhouse technology project, including recommendations for possible improvements 4. UAQ scholar developed methods to extract lycopene from tomatoes as part of quality assurance in post harvest 5. One TIES student conducted research on hydroponic methods using tezontle for diversified production 6. One TIES student conducted research on air flow computer simulation in greenhouse buildings using numerical methods 7. One TIES student developed economics and business planning and modeling for small greenhouse producers 8. Design of new greenhouse models. 9. Development of a protocol for greenhouse environmental compliance	4. "Environmental Compliance Protocol for Small Greenhouse Operation" 5. Master's thesis: "Greenhouse growing methods for niche market products" 6. Article on heat sinks with gravel and water buffers 7. One Poster Presentation at the annual meeting of ASHS in Orlando

**Value to U.S. Partners:** When asked about the value of the TIES program to their campuses, the U.S. TIES partners reported that the TIES partnerships provided opportunities for U.S. universities to increase their international perspective by building important linkages with Mexican faculty, engaging in valuable collaboration on research projects, gaining knowledge and experience in managing exchanges, and facilitating further internationalization of the curriculum (See Table 7).

At Pennsylvania State University, the TIES partnership had an impact on the university's extension program that serves an increasingly Latino or Spanish-speaking audience. Faculty and staff gained valuable experience working closely with the Mexican graduate students to better understand issues related to the increasing Hispanic agriculture community in Pennsylvania. Penn State developed a course, "Spanish for the Agriculture Industry," for students in the College of Agricultural Sciences. Materials and approaches developed for the TIES program have proved useful for the domestic outreach program to Spanish-speaking audiences in the United States.

The University of Wisconsin-Madison reported that the program had a major impact on local dairy farmers who hosted Mexican graduate students during internships. Since much of the labor on Wisconsin farms is now from Mexico, interns helped bridge the culture gap and, in some cases, provided valuable assistance to the U.S. farmers by assuming complex responsibilities that resulted in financial benefit to the U.S. farmers. The program assessed the training needs for both U.S. and Mexican workers in the dairy industry and developed new training materials in Spanish of benefit to U.S. Hispanic dairy workers. Research interns assisted the University of Wisconsin faculty by assuming specific responsibilities either in the laboratory or in the field that enabled research projects to move forward more quickly.

Collaborative research between faculty from ITESM- Querétaro and Wisconsin has resulted in improving the production of cheeses for the Hispanic market. Improvement in the flavor and quality of these cheeses is expected to impact imports from Mexico to the large Hispanic population in the United States. A new course developed for U.S. students with a follow-on dairy study tour to Mexico was a direct result of relationships built during the TIES program. Students who participate in this program have gained a much greater appreciation of Mexico and its people and have exhibited positive changes in attitudes toward Mexicans in the United States, particularly Mexican farm workers.

The TIES partnership benefited the University of Texas at Austin through knowledge gained specific to bilateral and reciprocal student exchange programs, in particular for improvement of programs serving Mexican students. Faculty became more engaged in cross-border ties such as sending faculty to conferences in Mexico and supporting Mexican faculty teaching in the U.S. through programs such as the Fulbright Scholar in Residence Program. For example, UTA's Center for Philanthropy and Community Service prioritized funding of \$500,000 for exchange opportunities to benefit relationships with Mexican institutions. U.S. faculty viewed the new relationships as an important resource for future programming. A major exchange benefit for the University of Texas at Austin was formal relationships with community organizations resulting in improved university outreach activities. A new Civil Society Summer Institute culminated in new curricula for classes at the LBJ School of Public Affairs at the University of Texas at Austin.

**Table 7.**  
**Value to U.S. Partners – Quantitative and Qualitative Information, U.S. Faculty/ Student Exchanges, Benefits to Academic Programs, Research, Publications and Presentations**  
Results of 8 TIES Partnerships

Partners	Number of U.S. Faculty/ Staff Exchanges to Mexico	Number of U.S. Student Exchanges to Mexico	Number of Benefits to U.S. Academic Programs	Number of U.S. Research Projects	Number of Publications/ Presentations by U.S. Faculty
University of New Mexico; Universidad de Quintana Roo	7		<ol style="list-style-type: none"> <li>Exchange program operated for the first time. Mexican students brought new perspectives to U.S. classrooms.</li> <li>Agreement signed to facilitate future exchanges.</li> </ol>		
University of Texas at Austin; Benemérita Universidad Autónoma de Puebla			<ol style="list-style-type: none"> <li>Partnership benefitted UT- Austin to help train future leaders of the nonprofit sector .Development of Civil Society summer institute culminated in new curricula and improved university outreach.</li> <li>UT-Austin benefitted from the collaboration and new knowledge that Mexican students bring to the campus and courses and prioritized \$500,000 funding for exchanges with Mexico.</li> <li>Partnership has enhanced UTA in other aspects of its work in civil society education, research, and outreach.</li> </ol>		<ol style="list-style-type: none"> <li>U.S. faculty presented "The Effects of Legislation on Volunteer Involvement in Select Health and Human Service Organizations at the CEMEFI 2006 Conference in Mexico City.</li> </ol>
University of Wisconsin-Madison; ITESM-Querétaro		<ol style="list-style-type: none"> <li>Four women students attended ITESM-CQ during summer 04 via a student exchange agreement between the two institutions (No project funds used).</li> <li>UW students have the opportunity to take Spanish language classes in Mexico to improve their language proficiency when living with a host family while learning first-hand about Mexican culture.</li> </ol>	<ol style="list-style-type: none"> <li>New courses developed to provide U.S. students with understanding of the diversity of dairy production systems in Mexico today UW students are knowledgeable about the Mexican dairy industry and dairy trade issues affecting the U.S. and Mexico.</li> <li>U.S. agricultural, biotechnology, and pharmaceutical companies are looking for bilingual graduates to strengthen and expand their overseas opportunities.</li> <li>New training materials in Spanish developed for U.S. workers in dairy industry.</li> </ol>	<ol style="list-style-type: none"> <li>U.S. professors collaborated on a research project focusing on producing safer cheeses for the Hispanic market. Determined micro-biological difference in three leading cheese types from three Hispanic regions as compared to their U.S. counterparts.</li> <li>Collaborative research conducted concerning whey pollution in Mexico.</li> </ol>	
Cornell University; Universidad Autónoma de Yucatán and Universidad Veracruzana	<ol style="list-style-type: none"> <li>Program has opened up possibility of higher degree of interaction between academic and research groups in both institutions.</li> </ol>	<ol style="list-style-type: none"> <li>Two PhD students conducted research in Mexico.</li> <li>Exchanges for Cornell students enabled participation</li> </ol>	<ol style="list-style-type: none"> <li>Enhanced Cornell's ability to train future international professionals to deal with global problems. Faculty further developed skills to facilitate cross-cultural, interdisciplinary research and instruction.</li> </ol>	<ol style="list-style-type: none"> <li>Five Cornell Master's theses on agricultural systems available as a result of TIES program.</li> </ol>	<ol style="list-style-type: none"> <li>Nine workshop, symposium presentations by TIES director and Cornell faculty.</li> </ol>

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**Value to U.S. Partners – Quantitative and Qualitative Information, U.S. Faculty/ Student Exchanges, Benefits to Academic Programs, Research, Publications and Presentations**  
Results of 8 TIES Partnerships

Partners	Number of U.S. Faculty/ Staff Exchanges to Mexico	Number of U.S. Student Exchanges to Mexico	Number of Benefits to U.S. Academic Programs	Number of U.S. Research Projects	Number of Publications/ Presentations by U.S. Faculty
		in “living laboratory” field experience.	<ol style="list-style-type: none"> <li>Five short courses made available on web - platform, Cornell Transnational Learning.</li> <li>Development of a substantial archive of print and electronic learning materials.</li> <li>MOU between Cornell University and Universidad Veracruzana.</li> </ol>		
University of Georgia; Universidad Veracruzana	<ol style="list-style-type: none"> <li>4 men /3 women.</li> <li>Continued exchanges with UGA department of informatics.</li> </ol>				<ol style="list-style-type: none"> <li>U.S. PI presented paper on the marginal coffee growing areas of Veracruz at the 9<sup>th</sup> Annual Conference of the Americas in 2006</li> </ol>
University of Notre Dame; Universidad de Guadalajara	7 faculty had international experience teaching mini-courses in Mexico.	<ol style="list-style-type: none"> <li>U.S. advanced undergraduates benefitted from summer internship opportunities.</li> </ol>		<ol style="list-style-type: none"> <li>Agricultural research projects conducted by UD interns in Mexico together with Mexican MBA students.</li> </ol>	<ol style="list-style-type: none"> <li>One of the U.S. faculty involved in the TIES project published a book on NAFTA and the Mexican small-size agricultural producers, a publication was a by-product of the partnership</li> </ol>
Pennsylvania State University; Universidad de Guanajuato	4 men		<ol style="list-style-type: none"> <li>New opportunities to internationalize the extension programs in Pennsylvania to serve an increasingly Hispanic audience.</li> <li>Built important linkages between faculty of both institutions.</li> <li>New “Spanish for the Agriculture Industry” developed for students in the College of Agricultural Sciences.</li> </ol>	<ol style="list-style-type: none"> <li>Joint research in horticulture and plastics: “The Impact of Different Colored Mulches on Growth and Yield of Peppers and Tomatoes.</li> </ol>	<ol style="list-style-type: none"> <li>Penn State-Mexico Seminar as result of partnership.</li> </ol>
West Virginia University; Universidad Autónoma de Querétaro	<ol style="list-style-type: none"> <li>Five faculties have expanded professional networks.</li> <li>1 WVU faculty member spent a sabbatical year in Querétaro</li> </ol>	12 students benefitted from exchanges to develop international competence.	<ol style="list-style-type: none"> <li>WVU has expanded its international profile.</li> <li>Students offered opportunities to increase global competence.</li> </ol>	<ol style="list-style-type: none"> <li>Seven research projects.</li> </ol>	<ol style="list-style-type: none"> <li>Five publications/ presentations.</li> </ol>

Relationships developed between institutions as a result of the TIES partnership continue to offer ongoing advantages to the U.S. universities. The University of Georgia has benefited from partnership collaborations with faculty in informatics at the Universidad Veracruzana. U.S. faculty were invited to present a series of lectures in instructional technology at the university in Mexico; the U.S. faculty member and his graduate student expanded their collaboration to include the University of Tabasco in Villahermosa and the University of Aguascalientes. The latter institution has also funded the U.S. graduate student to present a paper at its annual conference in Aguascalientes.

The University of Notre Dame was able to engage faculty in teaching courses at the University of Guanajuato that contributed to a new undergraduate program in agribusiness at the Mexican institution. The TIES partnership offered advanced undergraduates from Notre Dame a summer practicum experience in Mexico to work on agricultural projects in rural areas in Jalisco, Michoacán, and Sinaloa. U.S. faculty and students expanded their knowledge and experience of Mexican academic institutions and educational systems while gaining an understanding of the challenges facing Mexican agribusiness and rural communities.

After U.S. funding ended, there have been continued opportunities for research and educational exchanges among faculty members from the U.S. and Mexican universities. One faculty member, for example, published a book on NAFTA and small-scale agricultural producers.

The TIES activities helped to build capacity and enhance Cornell University's ability to train future international professionals interested in global agricultural issues. Faculty members reported strengthening their methodological skills to facilitate cross-cultural, interdisciplinary research and instruction. Personal interactions and communications were improved between interested faculty members and research scientists to address real world problems and constraints. In summary, Cornell partners said they are now better prepared to focus on relevant issues with scientists and students at partner institutions. Cornell University's joint programming that included videoconferencing for both U.S. and Mexican graduates and undergraduates resulted in building a substantial archive of print and electronic learning materials. The web site, established for the TIES program, provided video-recordings of short courses and materials for Cornell students as well as for students from Universidad Autónoma de Yucatán and the Universidad Veracruzana. Exchanges benefited Cornell students who were able to interact with farmers, extension agents, researchers, and policymakers in rural and urban Yucatán, Tabasco and Veracruz while clarifying their own perspectives on the needs of farmers and rural communities in a "living laboratory" field experience. Cornell researchers report sharing results of collaborative research with sister institutions in the region including Colombia and Venezuela through invited presentations and publications. As part of the TIES partnership, several Cornell faculty gave conference presentations about Mexican issues and priority themes in the Gulf of Mexico. A memorandum of understanding (MOU) between Cornell University and the Universidad Veracruzana is providing opportunities for further collaboration.

The TIES partnership represented the first effort of the University of New Mexico's Community and Regional Planning Program to organize and implement a full international student exchange that led to

the creation of a *Convenio* (agreement) between the University and the Universidad de Quintana Roo to facilitate future exchanges between the two institutions. Participation of Mexican students in classes at the University of New Mexico were seen as adding an important perspective to scholarly discussion and insights related to planning needs and concerns of the Gulf coast.

West Virginia University's collaboration with Universidad Autónoma de Querétaro encouraged the U.S. institution to expand its international profile and offer opportunities for students to acquire valuable global perspectives. Undergraduate students have had opportunities to interact with Mexican visitors, and have traveled to Querétaro to become involved in the greenhouse development project. Faculty members have expanded professional networks and one U.S. faculty member has already spent a sabbatical year at an institution in Querétaro, which allowed him to maintain the connections with Universidad Autónoma de Querétaro.

**Contributions to Mexico's National Development Goals:** The TIES program was expected to strengthen higher education institutions in Mexico as a way to increase their contributions to sustainable social and economic development. It was based on the assumption that the United States and Mexico share common interests and agree on critical development issues. As members of NAFTA (since 1994) and the Partnership for Prosperity (PFP), launched in 2002, both countries are committed to promoting economic stability within the region, and expanding growth in trade and investment that will lead to greater job opportunities for Mexicans (See Table 8).

The TIES higher education partnerships program is one of two components of the U.S.-Mexico TIES Partnership focusing on research universities, the other is a community college level program promoting applied knowledge and skills development. USAID/Mexico has targeted research and technology within universities as one way to engender innovation and enhance trade for Mexico's agricultural products. First, USAID/Mexico recognized the need for faculty training in new development-oriented programs, in the creation of new curricula, and for graduate level courses to educate a new generation of young leaders and professionals. Second, the Mission has also noted the need for higher education institutions to take "knowledge to the people" through extension and public service programs as a way to provide ongoing training for the current workforce, thus enabling both employers and employees to respond to the opportunities created by NAFTA and the PFP. This second focus points to increased involvement of two-year colleges and an emphasis on applied education.

Each of the TIES higher education partnerships was asked to identify a particular development issue as the core of its partnership activities. In the first round of funding, 17 higher education partnerships responded to the following national development goals:

- leadership development for civil society;
- regional concerns for agriculture development and sustainability particularly rural activities, dairying for example. Dairying is seen as an especially powerful engine for economic growth because it generates significant employment in production and processing, and can provide a year-round source of income for Mexican dairy workers.

The second round of funding for 13 higher education partnerships focused more specifically on increasing Mexico's competitiveness and on local and regional development. Given the predominance of agriculture in the Mexican economy, these partnerships included agricultural diversification, agribusiness, entrepreneurship, small-business development, and support for ruminant livestock systems as part of the rural economy. The third and fourth rounds of funding also included a focus on rural development with partnership support for small farmers affected by adverse economic conditions as a way to increase rural prosperity for small-scale producers by helping farmers respond to new market opportunities and increased competitiveness.

### *Research Results for National Development*

Collaborative research leading to the production of a new curriculum for disaster mitigation in the state of Quintana Roo was distributed to the eight municipal governments and their civil defense offices, government agencies at the state and federal levels including the army and naval sectors, the private sector, NGOs, and academics. The document is important for policy-level decision makers since it serves as a basis for a dialogue about how to build capacity to mitigate the effects of natural and induced disasters in Quintana Roo, a state particularly vulnerable to the effects of hurricanes. The document moves the discussion of disaster mitigation beyond a very narrow and limited focus on emergency response to a process that includes mitigation, preparation, emergency response, recuperation, and reconstruction promoting long-term effectiveness and recovery.

Collaborative research by engineers from the United States and Mexico on climate control and the operation and management of greenhouse technology has resulted in the Universidad Autónoma Querétaro (UAQ) becoming known for its expertise in greenhouse technology. Small greenhouses geared for small-scale rural producers provide sustainable development opportunities as a result of the support and “know-how” of UAQ researchers. The Mexican university's programs have been recognized by the Querétaro State Council for Science and Technology and the National Council for Science and Technology for major contributions to national development. One graduate from the Universidad Veracruzana, now working at the Center for Tropical Research (CITRO), is focusing her research on small-scale marginal coffee farmers in the state of Veracruz and will contribute to the CITRO's work on agricultural diversification. The combined effects of applied research by students at the Universidad de Guadalajara on small and medium-scale agricultural producers in rural areas to improve business skills and approaches for marketing and business operations is expected to bring further benefits to the local communities. Research presentations by faculty and students at Mexican national and international conferences such as the annual conference of the *Centro Mexicano para la Filantropía* (CEMEFI) is evidence of the importance of applied research to local Mexican organizations. In addition, more graduate student research has been underwritten by farmers' cooperatives and farmer organizations working with the Universidad Autónoma de Yucatán.

### *Activities to Contribute to National Development Goals*

Faculty training resulted in improved teaching capacity in the *Programa Postgrado en Planeación* at Universidad de Quintana Roo, and in promotion of collaborative processes of academic decision making. The university was able to “train trainers” in natural resources management and work with municipal

government officials from the state of Quintana Roo. University workshops contributed to the discourse around revision of Quintana Roo's land use planning for environmental impact and sustainable development.

Faculty training in agribusiness, housing, and consumer science, food science and technology, and instructional technology has increased teaching capacity at Universidad Veracruzana and in Chiapas. The Universidad de Guadalajara has introduced a new undergraduate program in agribusiness with the help of training from University of Notre Dame.

Multi-disciplinary, problem solving systems-based approaches to education on livestock production in the Gulf region have been introduced into universities where previously a discipline-specific approach to agriculture was the norm. The result has been a "widening of vision" among participants in the universities' programs. The inclusion of livestock owners and other professionals into the short courses offered by the Cornell-UADY partnership expanded availability of critical information to small farmers in lowland tropical areas. Learning materials archived in web format such as the Cornell Transnational Learning (<http://www.ctll.com/>) provide new knowledge about development issues to a broader audience who will benefit from new ideas in livestock production.

Networks developed between the University of Texas at Austin, Benemérita Universidad Autónoma de Puebla, ITESM-Mexico City and the Colegio Mexiquense have enabled Mexican faculty to consult with their U.S. counterparts on course content for the development of a new discipline in civil society studies. Professional development training for ITESM-Ciudad Querétaro faculty has improved both research and teaching and has resulted in expanded outreach activities and courses for students in dairy technology, animal nutrition, and agribusiness management as a result of the partnership with University of Wisconsin - Madison. Training programs conducted by the university have promoted workforce development in the Mexican dairy industry and have introduced simple Spanish language materials for dairy producers who have low reading capability.

Partners from Pennsylvania State University and Universidad de Guanajuato have created popular extension service models that include technology transfer to producers and citizens in rural communities. Continuing support for extension by the university and the building of new facilities for extension education demonstrate the importance of the university's capability in reaching outside the walls of the institution and provide technical assistance to small-scale producers.

**Table 8.**  
**Evidence of Sustainability and Impacts Related to Mexico’s National Development Goals**  
Results of 8 TIES Partnerships

Partners	Evidence of Sustainability	Impact on National Development Goals
<p>University of New Mexico (UNM); Universidad de Quintana Roo (UQRoo)</p>	<p>UQRoo faculty teaching capacity in Programa Postgrado en Planeación (PPP) increased.</p> <p>Faculty trained in facilitation and collaborative processes of decision-making.</p> <p>Training of trainers in Natural Resource Management and training of municipal government officials from state of Quintana Roo.</p> <p>Planning students created a first draft of a strategic development plan for the Zona Maya in the State of Quintana Roo.</p> <p>Students participated in the governor of Quintana Roo's request that UQRoo lead the effort for a strategic plan in the area.</p> <p>Students presented their work to the Committee for Development in Indigenous Communities.</p>	<p>Workshops contribute to discourse around revision of Quintana Roos’s land use plan for environmental impact and sustainable development.</p> <p>Collaborative publication of a new curriculum for disaster mitigation of key importance as presents a new approach moving away from narrow conceptual focus of mitigation limited to emergency response. Urges institutions to take a much wider examination of the issues and offers a concrete proposal on establishing capacity building from one-time trainings to doctoral level degree programs.</p> <p>Survey of municipal governments using participants’ knowledge to generate collective understandings of critical regional environmental planning tools.</p>
<p>University of Texas at Austin; Benemérita de Puebla (BUAP) Universidad Autónoma de Puebla, El Colegio Mexiquense, ITESM-DF</p>	<p>Creation of new generation of research and bilateral collaborative work.</p> <p>Networks created enable Mexican faculty to consult on course content and development of civil society programs with U.S. peers.</p> <p>New knowledge gained through conferences and meetings focused on civil society studies</p> <p>ITESM-DF created program offering support for professors and students to study, conduct research and publish on civil society issues.</p> <p>ITESM-DF collaborated with the Mexican Center for Philanthropy, Centro Mexicano para la Filantropía (CEMEFI), to bring speakers and visiting scholars to campus to make presentations on civil society.</p> <p>El Colegio Mexiquense created a formal seminar involving research on civil society as a precursor to selection for participation in Civil Society Summer Institute.</p> <p>3 Mexican institutions looking to support student participation in Civil Society Summer Institute.</p> <p>Civil Society Summer Institute created in Mexico.</p>	<p>Students trained to become young leaders in development of civil society in Mexico.</p> <p>Links developed with Instituto de Desarrollo Social (INDESOL) quasi-governmental institution interested in establishing effective communication between government and civil society through education and community participation.</p> <p>Links established with Centro Mexicano para la Filantropía (CEMEFI), an education, research and outreach center whose purpose is to serve non-profits, governmental institutions, for profit organizations and the community to promote a deeper understanding of the third sector in Mexico. Mexican universities continue to work closely with CEMEFI. The organization was a major partner in international conference in Mexico, students made conference presentations.</p>

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**Evidence of Sustainability and Impacts Related to Mexico’s National Development Goals**  
Results of 8 TIES Partnerships

Partners	Evidence of Sustainability	Impact on National Development Goals
University of Wisconsin-Madison (UWM); ITESM-Querétaro	<p>Professional development training for ITESM faculty has improved teaching and research capabilities and resulted in improved and expanded outreach activities and courses for students in dairy technology, animal nutrition and agribusiness management.</p> <p>Training the trainer workshops conducted for employees of Fundación Produce.</p>	<p>Program strengthened trade links by familiarizing students with dairy industry in the United States and through faculty collaboration on manufacture of cheeses for sale within and outside Mexico.</p> <p>Training programs have promoted workforce development- assessment of training needs of Mexican dairy subsistence farmers resulted in training materials made available in Spanish for use by organizations who work with farm producers. Some materials developed specifically for dairy producers who cannot read or have low reading capability. Other materials prepared for dairy producers with intermediate to advanced reading capability.</p>
Cornell University (CU); Universidad Autónoma de Yucatán (UADY), Universidad Veracruzana (UV) and INIFAP	<p>Multi-disciplinary, problem-solving, systems-based approach to education on livestock production systems in the Gulf region introduced into Latin American universities where highly disciplinary approaches to agriculture and veterinary science are the norm resulted in a “widening of vision” among participants.</p> <p>An MOU has been signed with UV and cooperative projects developed with Instituto Nacional de Investigación Forestales, Agrícolas y Pecuarias. (INIFAP).</p>	<p>Project is good fit with INIFAP’s new policy of forging alliances with other institutions and expanding educational efforts as enormous deficit of information on problems of small farmer in lowland tropical areas exists. Project developed large amount of information available via the Internet.</p> <p>Livestock owners and other professionals benefitted from decision support for systems they managed through short courses delivered by UADY.</p>
University of Georgia (UGA); Universidad Veracruzana (UV)	<p>UV acquired new faculty expertise in agribusiness, housing and consumer science, food science and technology, and instructional technology that has strengthened the instructional program.</p> <ul style="list-style-type: none"> <li>• 1 graduate, an agricultural economist, returned to Mexico to teach three undergraduate courses at the School of Business at UV and two more in a private institution.</li> <li>• 1 graduate in housing and consumer economics teaching economic development in the Department of Economics at UV.</li> <li>• Student who graduated with graduate degree in food science and technology working at the School for Foreign Students at Universidad Veracruzana.</li> <li>• 1 graduate in Middle School English Education provided English instruction for new TIES recipients going to the United States and is working at university in Chiapas.</li> <li>• 2 TIES graduates now enrolled for advanced degrees in Mexico.</li> </ul>	<p>As the only economist at the Center for Tropical Research and Investigation (CITRO), a TIES graduate student’s research is contributing to the understanding of agricultural diversification for small-scale marginal coffee farmers in state of Veracruz.</p>
University of Notre Dame (UND); Universidad de Guadalajara (UG)	<p>Faculty training in entrepreneurship has enabled UG’s Center for Business and Economic Studies (CUCEA) to continue to offer new graduate program in agribusiness, entrepreneurship and small-business development that will also be available to professionals and personnel from NGOs,</p> <p>New undergraduate program in entrepreneurship established to train future generations of students.</p>	<p>Small- and medium-scale agricultural producers in rural areas benefited from applied student research presenting new visions, tools, and opportunities to apply business skills and approaches towards improving the market and business situation of their operations. Perceived improvements will trickle down with further benefits to their communities.</p> <p>“Imitation” effect among farming peers likely to trigger additional benefits to other agricultural producers.</p>

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**Evidence of Sustainability and Impacts Related to Mexico’s National Development Goals**  
Results of 8 TIES Partnerships

Partners	Evidence of Sustainability	Impact on National Development Goals
<p>Pennsylvania State University (PSU); Universidad de Guanajuato (UG)</p>	<p>Partners set precedent at UG in creating a successful extension services model, including technology transfer to producers and people from rural communities</p> <ul style="list-style-type: none"> <li>• 36 students trained to work on extension services in rural communities.</li> <li>• 5 different hands on projects started in 15 rural communities.</li> </ul> <p>University of Guanajuato has moved forward on its plan for new graduate curriculum to train the next generation of extension educators as requested by the Guanajuato State Minister of Agriculture.</p> <p>Ministry of Agriculture renewed its support for continuing the extension project. Longer term support may result in extension work of universities becoming national policy.</p> <p>New facilities have been built at the University of Guanajuato for extension/outreach programming delivery. Greenhouses dedicated to horticulture are research and demonstration sites for small-scale production.</p> <p>Extension activities in several municipalities are supported by the Federal Secretary of Agriculture (SAGARPA).</p> <p>4-H clubs established in 5 to 6 locations in Guanajuato and UG faculty trained on development of curriculum to be contributed to community leaders.</p>	<p>New plasticulture technology introduced to small-scale producers to assist in shift to production of higher value crops such as small fruits and vegetables by extension educators at UG.</p> <p>Technology transfer to producers of La Purisma, a farmers’ cooperative in Guanajuato, resulted in 20% reduction in costs and a 12% higher yield from sorghum, which increased demand for extension services from UG.</p> <p>Small-scale producers interested in hydroponic forage produced at fraction of normal forage cost and dairy cows feeding at lower cost.</p> <p>Groups of small-scale producers owning greenhouses requesting technical assistance with tomato growing.</p> <p>SAGARPA support for expansion of extension activities in rural areas of several municipalities.</p>
<p>West Virginia University (WVU); Universidad Autónoma de Querétaro (UAQ)</p>	<p>Universidad Autónoma Querétaro (UAQ) has become known in Mexico for its expertise in greenhouse technology and high output of graduates. UAQ is source of supply of human capacity skills critical to sustain greenhouse operation within the region.</p> <p>Increased “know how” and expertise in area of greenhouse design, operation and management by first generation of graduates. Research theses related to greenhouse technology available.</p> <p>UAQ will train other professionals in Mexico through the Master in Engineering with Specialization in Greenhouse Technology and the Associate Degree in Greenhouse Technology.</p> <p>The states of Oaxaca and Zacatecas have established links with Universidad Autónoma Querétaro to train workers in climate control systems for greenhouse applications.</p>	<p>Small greenhouses geared for rural small-scale producers provide sustainable employment opportunities and can be a vehicle for economic development provided they have access to “know-how” and information which is now available at UAQ.</p> <p>Amazcala Complex developed by university as an experimental greenhouse station where people from region who are well-positioned to operate and maintain own family’s greenhouse business or work in one in the area can gain a realistic view of greenhouse production potential for their families. Complex produces and supplies food for local community in Amazcala, Querétaro city, and the university community.</p> <p>UAQ programs recognized by the state’s Council for Science and Technology and the National Council for Science and Technology for their contributions to the country.</p>

**Lessons Learned Related to Partnership Success:** U.S. partnership directors discussed successes and sustainability of higher education partnerships at the September 2010, TIES Impact Assessment Roundtable conducted by HED in Washington, DC. Findings shared by the eight directors about their partnership experiences focused on the following:

- enabling conditions;
- importance of government support and complementary funding;
- alignment of structures and administration of higher education systems in the two countries;
- student preparation to take advantage of opportunities presented by an international program; and
- longer time needed to develop ongoing inter-institutional relationships that will impact national development goals.

### *Enabling Conditions*

U.S. partners recognized that institutional strengthening within the context of a higher education partnership requires a deep and lasting commitment to international programs at the highest levels of the university system. They found, even with this stated commitment, that access to resources for faculty and student engagement was not always sufficient to ensure the expected level of cooperation at the Mexican institutions despite considerable cash contributions from the university and logistical support from collaborating individuals. Partners agreed that an “upfront,” common understanding of the goals for the partnership is a requirement for success, goals that go beyond the research and technical interests of individual faculty.

Cornell University faculty expressed the view that an international project requires unified commitment and cooperation of faculty, students, university authorities, administrative personnel, and internal consensus at the department level. They went on to say that consensus building about planned research, new teaching, and expenditure of partnership funds must be determined from the very beginning of the partnership implementation.

Partners explained that existing institutional capacity to support an international program varied considerably among institutions. The University of Texas at Austin found that divisions between academic and administrative functions within the Mexican institution made it more difficult to build on program learning with regard to returning exchange students. Pennsylvania State University discovered that in a complex project involving curriculum development and applied research, it is critical to have a transparent process of communication among the partners to avoid misunderstandings related to the roles and responsibilities of administrative staff, faculty leaders, faculty mentors, and students. They noted that turnover of staff at the senior level in the home institution meant that an on-going case had to be made for continued support for the Mexican partnership.

### *Importance of Government Support and Complementary Funding*

During the U.S. partner roundtable, two of the eight directors cited government support as critical to the success of the partnership. While partners recognized that institutional priorities may shift in response to

external political and economic factors, and faculty research interests may diverge as individual actors change, support for new programs and capacity to provide training “outside the walls” to beneficiaries, government funding is a major factor for sustainability of partnership impact.

Pennsylvania State University’s partnership with the Universidad de Guanajuato resulted in rebuilding extension capacity as part of the institution’s role in the community and state. The partnership provided new opportunities to engage with local and state politicians to support the university’s advancement in extension and outreach activities. Mexican higher education’s professional ties to government, outside industries, NGOs, and the private sector are considered essential for project impact outside the higher education institution. While the location of partnership activities may be in universities, participatory relations with local communities including joint oversight is also critical. Without this collaboration there will be insufficient breadth from supporting constituencies.

*Alignment of Structures and Administration of Higher Education  
in Mexico and the United States—‘The Culture of Higher Education’*

U.S. partners recognized that the higher education context, or *culture of higher education*, differs markedly between the United States and Mexico and that this variation sometimes affected the amount of influence they were able to exert during the partnership. They suggested that each party needs to be aware of possible barriers to effectiveness and recognize challenges if the partnership is to succeed. They noted, however, that some challenges could be overcome during partnership activities, and for both sets of partners, the experience of managing an international program was an opportunity to learn new ways of partnership implementation and operation within the international higher education community.

U.S. partners agreed that there needs to be ‘a good fit’ between a partnership’s goals and the mission of the Mexican institution to internationalize its operations and strengthen the institution. Perceptions that the partnership is more supply-led by the United States than demand-led by the Mexican institution may have had an effect on the level of faculty participation, which often requires taking on an additional workload. U.S. partners also noted that higher education incentive/reward systems vary between the United States and Mexico and that mismatches in faculty perceptions may be explained by the differing emphasis placed on professional development and teaching in the United States and Mexico. The USAID-sponsored partnerships may also differ from other donor efforts Mexicans are familiar with where ‘donation of funds and equipment’ is the norm, rather than ‘support for human and institutional strengthening.’

Partnerships involving more than one Mexican higher education institution posed even more complex management challenges as different institutions have varying policies for faculty release time and cost share contribution. Cornell University found that its relationship with two major Mexican institutions posed management challenges in term of operation as “transaction costs” were extremely high and problems were encountered between the intrinsically different academic and financial administrative structures and decision making processes of the partner institutions. The project’s role, however, in bringing together local partners that do not normally collaborate and share resources, is a step toward further communication and inter-institutional collaboration.

The University of Georgia found that its Mexican partner does not allow recently hired faculty to leave during the first two years of employment. Therefore, finding new candidates for graduate training delayed partnership completion even though a no-cost extension was granted by HED. Still, delays can absorb program monies and require supplemental funding. Sometimes the Mexican institution is not able to engage quickly the returning graduates and this barrier limits the impact of institutional capacity strengthening in spite of the graduates' multi-disciplinary training.

The size of the Mexican institution sometimes affects how both faculty and students are able to benefit from the partnership. The University of Wisconsin-Madison found when working with a relatively small faculty group with many different responsibilities, the number of individuals able to be away for a period of 8 to 10 weeks for professional development in the United States was limited. Of major impact on the Wisconsin partnership was the inability to establish a new master's program due to a change in policy at the Mexican institution.

The University of Notre Dame found that starting a new minor in agribusiness and entrepreneurship at the Mexican institution placed a heavy load on the students since the new requirements were added to existing coursework for the MBA program and nothing was eliminated. The University of Texas at Austin also discovered that an unexpected schedule change from a semester course to a summer program covering the same number of class hours for the exchange program did not allow for internships or extended volunteer programs with NGOs and civil society organizations in the United States. In summary, the U.S. partners recommend extensive mutual cooperation and understanding between the partners to complete tasks and reach objectives especially when major changes involve the culture of academia.

### *Student Preparedness*

All U.S. partners found that Mexican students were not well-prepared for exchanges and graduate work in a U.S. university largely due to their less than sufficient English language proficiency. U.S. institutions made every effort to accommodate Mexican students by assisting with intensive English language training. For example, at the University of Georgia, a teacher was sent to Mexico to help the prospective TIES students prepare for the TOEFL examination. It was encouraging to note that once in the United States, the students took advantage of leveraging campus resources and made remarkable progress. Some U.S. faculty found, however, that the students' skills in the hard sciences and in advanced quantitative training were lacking as well, which resulted from some students making a cross-disciplinary shift from their undergraduate studies in Mexico to graduate work in the United States.

Improved selection procedures can partly overcome some of the student academic weaknesses. The partners agreed that focus on language capabilities alone without the necessary academic skills to undertake graduate work would be problematic. Pennsylvania State University recognized that the collaborating institutions might do more to prepare students for their future professional leadership roles by better equipping them with an understanding of the goals for the USAID program and how their participation in training in the United States is critical to the development of agriculture in Mexico.

### *Ensuring Sustainability Requires Time*

The differing higher education cultures in Mexico and the United States contribute to the need for “time” to validate sustainability of capacity building. U.S. partners offered suggestions about sustainability of U.S.-Mexico institutional strengthening processes related to the current university context in Mexico. The West Virginia University noted that until the partnership with Universidad Autónoma de Querétaro (UAQ), “know-how” and expertise in greenhouse design, operation, and management was basically limited to a few experienced people in the country including the partnership director at UAQ. One of the key objectives for the partnership was the sustainable development of human capacity in the area of greenhouse technology. The partnership has now produced a group of professionals who will train others through the master’s degree in engineering with a specialization in Greenhouse Technology that will graduate professionals who can design, build, operate, and maintain greenhouse facilities. Together with a program leading to an associate degree for undergraduates, these educational programs are the first of their kind in Mexico. The U.S. partners also said that it will take several generations for these programs to mature and become long-lasting even though they have already been recognized for their contributions to the State. The programs are still too new and the “critical mass” of professionals in this area still developing. The U.S. partners, however, estimate that within five years there will be a sufficient supply of human capacity to compensate for professional mobility and market variability.

Two other U.S. partners noted the need for an extended period of partnership activity to consolidate gains made during the period of the TIES partnership. The initial round of TIES funding in 2002, was for two years, and while the partnership between the University of New Mexico and the Universidad de Quintana Roo laid the groundwork for independent capacity building on the part of the Mexican institution to provide training in natural resources planning and management, the timeframe was too short to consolidate fully the work accomplished.

The University of New Mexico partner suggested that one of the most difficult aspects of technical assistance is securing the long-term commitment of local institutions “to receive, digest, incorporate, and subsequently modify the content” of new programs. Both institutional priorities and personnel changes over time may erode support. One suggestion from the TIES partnership director was for a phasing of the institution-building model with an initial three-year investment by both sets of partners with a subsequent set of on-the-ground practical projects lasting no less than three additional years based on the rate of success during the first-time period. The rationale for this model is that there is a need to motivate and support continuing interests from external constituencies, which are most likely to grow when examples of success are evident.

Institutional changes as a result of the TIES partnership most likely to affect future students include expanding the flexibility of the undergraduate curriculum, improving the system of coursework accreditation, and including the teaching of English during the first three years. These changes are likely to mean that current problems faced by the partners in terms of freeing up students to take part in new activities such as field work, and offering credits for applied course work help to remove disincentives for students and faculty to participate more frequently in experiential learning activities.

**Serendipitous Outcomes:** TIES partnership directors stated that it is not possible to predict all the benefits of a higher education partnership at the beginning. Partnerships evolve over time often as political circumstances and academic administrations change. The following examples, however, are some of the positive outcomes of TIES partnerships gained from interviews and site visits with Mexican partnership directors during the fall 2010, not envisioned at the beginning of the TIES program.

*Follow-on degrees.* Of the 16 Mexican graduate students who obtained master's degrees in the United States, four are now pursuing doctorates--three in Mexico, and one in the United States. One of the seven students who studied at Pennsylvania State University is pursuing a doctorate in Canada after obtaining a master's degree from the Universidad de Guanajuato. The topics for the doctoral research are related to Mexico's national development goals for agriculture diversification, environmental sustainability, food science and technology. The students are expected to become part of the next generation of academic leaders and researchers in Mexico.

*Research with immediate application.* Applied research at the master's level has contributed to the understanding of agricultural diversification for small-scale, marginal coffee farmers in Zozocolco. Findings from a TIES motivated research study on diversification including 800 local farmers have pointed to investment in guava, timber, and flowers as additional crops for the farmers. A study of payment for environmental services, such as maintenance of protected lands, is continuing and the results are expected to be utilized by 20 coffee farmers who are directly involved. Research findings have already been used as a reference for additional research studies at the Center for Tropical Research at Universidad de Veracruzana.

*Youth leadership training.* The TIES partnership between Pennsylvania State University and Universidad de Guanajuato generated additional project development. A 4-H program has been established at 10 preparatory schools associated with the university that currently involves over 1,000 students. There are plans for expansion of the program to 43 of the 45 municipalities in the state. This outreach program to youth is intended to encourage their continued engagement in agriculture. Four professors from the preparatory schools traveled to Pennsylvania in October 2010, to learn about replication of the 4-H program and the logistics and resources necessary for expansion. Support for the 4-H program has been obtained from the municipalities of Salamanca and Irapuato.

*A Small Business Development Center.* The internship program in applied research for Mexican MBA students at Universidad de Guadalajara revealed the need for additional follow up with rural producers in the region and led to the development of a small business development center at the university, directed by two former TIES interns. The center successfully applied for grants from the Jalisco state government in 2009, for entrepreneurship outreach and in 2010, for *diplomado* training.

*Influence on Gender.* The University of Wisconsin-Madison, reported that Mexican women students from ITESM-Querétaro, who took part in farm internships on dairy farms in Wisconsin, said that although females are discouraged from running farm equipment in Mexico, they were now confident with this part of farm management as a result of their internship work. In addition, the University of Wisconsin obtained a USDA Higher Education Challenge Grant to create experiential learning opportunities in

Mexico for men and women undergraduates and to internationalize the curriculum at both the college and high school levels in Wisconsin. The grant includes a seminar with a case study about the dairy industry, opportunities for a study tour in Mexico, a summer internship, and independent study to develop education materials for high school activities.

*Follow on Civil Society Studies.* The success of student exchanges to the United States and implementation of a new discipline such as civil society studies has prompted Mexican institutions to continue international collaborations through successful applications for U.S. grant funds. Benemérita Universidad Autónoma de Puebla and the Autonomous University of Tamaulipas will support 24 student exchanges with the United States and Canada over a three-year period starting in 2010.

*Enhanced University Reputation.* West Virginia University reported that research and academic activity at the Universidad Autónoma de Querétaro on greenhouse technology has reach universities and groups in other states including Estado de Mexico, Guanajuato, Hidalgo, Nayarit, Oaxaca, Yucatán, Zacatecas. The TIES partnership has increased the reputation of the university in the design, operation, and management of greenhouse technology.

*On-Going and Expanded Farmer Field Days.* Cornell University reported on successful outreach to farmers at a ‘Day of the Farmer’ in Tizimin in October 2010, for more than 250 participants including invited presentations from two of the Cornell graduates from the Universidad de Veracruzana. The event was sponsored by one of the TIES partners with support by others. It received detailed coverage in the Merida newspaper, *Por Esto!*

Table 9 describes serendipitous benefits from these eight TIES Partnerships unknown before the impact assessment was conducted.

<b>Table 9.</b> <b>Serendipitous Outcomes</b> Results of 8 TIES Partnerships	
<b>TIES Partners</b>	<b>Unexpected Outcomes</b>
University of New Mexico; Universidad de Quintana Roo	Leveraging of additional funds for up to 15 scholarships per year, \$230,000. 2009-2010 \$61,500 funding for graduate student offices, thesis support, internships, conference travel and computer equipment (laptops) at Universidad de Quintana Roo.
University of Texas at Austin; Benemérita Universidad Autónoma de Puebla	Successful application for grant funds from U.S. Department of Education, Fund for Improvement of Post Secondary Education with Autonomous University of Tamaulipas for \$188,382. Twenty-four student exchanges planned over a three year period 2010-2012.
University of Wisconsin-Madison; ITESM-Querétaro	<p>Mexican student interns remain in contact with Wisconsin host families, 6-7 years after visits to the United States. Women interns realized that their gender should not limit opportunities for employment in the dairy industry in Mexico.</p> <p>University of Wisconsin obtained a USDA Higher Education Challenge Grant to create experiential learning opportunities in Mexico for undergraduates and to internationalize the curriculum at both college and high school levels in Wisconsin. The grant includes a seminar with a case study of the dairy industry, opportunities for a study tour of Mexico, a summer internship and independent study to develop educational materials for high school activities.</p>
Cornell University; Universidad Autónoma de Yucatán	Day of the Farmer, October 2010, was sponsored by one of the TIES partners with participation by others received publicity in Merida newspaper <i>Por Esto!</i> on successful outreach to farmers at a Farmer Field Day in Tizimin for more than 250 participants with invited presentations by two of the Cornell graduates from Universidad Veracruzana.
University of Georgia; Universidad Veracruzana	Four of the seven graduate students who obtained master's degrees from the University of Georgia are pursuing doctorates in Mexico or the United States with a focus on agricultural diversification, environmental sustainability, food science and technology, public finance and sustainable rural development.
University of Notre Dame; Universidad de Guadalajara	TIES internship participants led development of a Small Business Development Center at the Mexican institution and work as director and senior consultants, providing the university's only outreach to rural producers.
Pennsylvania State University; Universidad de Guanajuato	Development of 4-H programs in 10 preparatory schools attached to Universidad de Guanajuato. Professors receiving training in replication of 4-H programs. Plans for expansion of 4-H program into 43 out of 45 municipalities in Guanajuato state.
West Virginia University; Universidad Autónoma de Querétaro	<p>Universidad Autónoma Querétaro quickly established a reputation for knowledge in greenhouse technology which has spread to universities and groups in Estado de Mexico, Guanajuato, Hidalgo, Nayarit, Oaxaca, Yucatán and Zacatecas.</p> <p>Obtained CONACyT funding of \$800,000 for student fellowships and \$900,000 from the Ministry of Education to expand Amazcala greenhouse complex as an experiential learning center.</p>

**Suggestions for Future Partnerships:** TIES Mexican and U.S. partnership directors provided HED with a number of suggestions for future higher education partnerships based on their experiences between 2003 and 2008.

1. A Clearly Developed Focus with Agreed Upon Goals and Objectives. Partners suggested that having a well-articulated development focus is important for alignment of partners' capabilities with partnership goals. When both U.S. and Mexican partners are committed to extension programs, for example, and have the administrative systems in place to carry out the activities, success is more likely.
2. Importance of Professional Development for Faculty. Faculty takes the lead to implement new programs in higher education institutions. Opportunities for professional collaborations with U.S. colleagues is one important way to expand expertise for existing faculty, new faculty, and future faculty.

Existing faculty benefit from collaborative opportunities that:

- result in innovative use of new technologies;
- assist in solving problems related to product manufacture and joint trade;
- improve skills leading to introduction of new degrees;
- offer opportunities to manage student exchange programs.

New faculty profit from doctoral research collaboration and opportunities to build relationships of trust with U.S. colleagues that can lead to directorships of future partnerships.

Graduate training for future faculty is important to ensure sufficient expertise for new disciplines and/or new coursework. Institutional strengthening, however, requires agreement by the university to employ the graduate as a faculty member after completion of training.

3. Importance of Graduate Training to Build a Critical Mass of Key Professionals in Areas Related to National Development Goals. Emphasis on graduate training in new disciplines, whether in the United States or in Mexico, is important to build a critical mass of skilled faculty to train professionals for the Mexican workforce.
4. Student Internships, Exchanges, and Short-Course Trainings as Part of the Program Mix. Future TIES partnerships should retain a mix of program components. Inclusion of student internships for laboratory research, applied research, or field experience are valuable for creating career interest on the part of Mexican students, and in developing new university centers. Student exchanges create interest for introducing new programs at Mexican institutions. Short-course trainings provides immediate access to new knowledge for faculty, students, and other professionals such as staff of NGOs, government officials, and the private sector. Short-course training, using video-conferencing and joint programming by the U.S. and Mexican institution, can lead to greater use of new technologies and pedagogies in the classroom for the benefit of student learning.

5. Longer Award Periods. Where introduction of new degree programs is envisaged as part of a partnership, whether at the *diplomado*, bachelor's or master's level, an extended award period is necessary to solidify the program for growth and sustainability. An upfront agreement is rarely enough to ensure longevity. Programmatic implementation and practice will determine sustainability and that requires time.
6. Student Tracking. To measure the contribution of human capital development to social and economic growth, career monitoring of graduates is necessary. Tracking student beneficiaries and tracking community beneficiaries are important indicators of institutional strengthening. One caveat is that the outcomes of TIES programs are usually seen at the university departmental level, not at the overall institutional level, consequently, departments might want to develop tracking of graduates as part of alumni relations.
7. Inclusion of English Language Training. Future TIES programming needs to give high priority to English language capabilities of graduate students, and, if necessary, extend the period of award to include pre-departure or in-country English language training.
8. Evaluation. Future TIES programming should include internal as well as external evaluation as part of the award. While external evaluations have provided helpful suggestions for highlighting strengths and weaknesses of the overall partnership, internal evaluation of short courses, for example, might lead to program improvement related to specific award activities.

**Summary Remarks:** TIES partnerships have clearly built human capacity and strengthened higher education institutions in Mexico – at least for the eight partnerships reviewed as part of this impact assessment. This study tracked the careers of graduate students who received master's degree training in the United States and Mexico. For example, five of the 16 new master's degree recipients joined the faculty of a Mexican university and are making substantial contributions.

The impact study also tracked the careers of Mexican graduate students who participated in internships and exchanges. These activities have had a catalytic effect on the careers of the individuals who took part. For example, three of the seven graduate students who spent a year at Pennsylvania State University learning about extension and agribusiness went on to complete master's degrees at Universidad de Guanajuato in agriculture and vegetable production; two others are working in extension for the John Deere company in Mexico; and one became the coordinator of the newly established agribusiness bachelor's program at the university.

Students from ITESM who had farm internships in Wisconsin have benefited from their exposure in the U.S. by gaining employment in the dairy sector. Universidad de Guadalajara MBA students are working in agribusiness as consultants in entrepreneurship and small and medium sized business development in Guadalajara. One of the students from Benemérita Universidad Autónoma de Puebla who received training in fundraising and volunteer management at the University of Texas at Austin has obtained a

position as director of the university lottery program funded by the private business sector and founded an NGO.

For institutional strengthening to occur, the Mexican university must be able to absorb the new graduates into its operating structure. Appropriate institutional changes make returning to the university with new graduate degrees both possible and attractive reducing the country's "brain drain." Faculty professional development is shown to be important, both for the individual and for the institution given the rate of faculty turnover in Mexican universities. Where Mexican faculty members were able to spend extended periods working with colleagues in the United States through exchange visits and internships, they reported:

- continuation of opportunities for professional consultation with U.S. professional colleagues about program development and course content;
- continued international collaboration through grant applications for student exchanges;
- incorporation of new learning into research, teaching, and revised courses at the Mexican institution;
- a widening academic vision beyond disciplinary boundaries, and a more holistic approach to development issues;
- exposure to new technologies, new modeling software, and use of video conferencing in the classroom;
- stimulation for inter-university collaboration within Mexico;
- increased awareness of ways to apply for external support for new university programs; and
- improved ways to increase university outreach to beneficiaries.

A second example of value from student and faculty exchanges was described by the University of Texas at Austin TIES director. This partnership triggered an interest in civil society studies at Benémerita Universidad Autónoma de Puebla that is now being met through the introduction of new courses, curricula, and study concentrations. The student exchange program with the University of Texas at Austin is continuing with support from the Mexican institution even though TIES funding has ended.

Human capacity building and institutional capacity strengthening are inseparable since the credibility of the institution is often dependent on the quality of its faculty and the quality of courses they teach in a particular discipline. Two of the TIES partnerships succeeded in enhancing the reputation of the Mexican institutions, particularly for extension and public service activities, that directly impact farmers and small-scale producers. Pennsylvania State University was instrumental in re-establishing extension activity at the Universidad de Guanajuato by training graduate students and faculty through applied research in the use of plasticulture in horticulture and with teaching techniques to impart this knowledge to citizens outside the university. West Virginia University and Universidad de Querétaro successfully created a cadre of professionals trained in the use of greenhouse technology through collaboration in applied research on development of technology automation for greenhouse operations. These two partnerships have resulted in new programs at the Mexican institutions that continue to train future professionals for the Mexican workforce.

Universidad de Guanajuato has introduced an undergraduate degree program and a *diplomado* in agribusiness. The bachelor's program was established in 2007, and is modeled after the undergraduate program at Pennsylvania State. It includes an English language component and a mandatory service requirement where students must spend six months "working in the field" providing services to rural communities. It will have its first graduates in 2011. The six month *diplomado* was established in 2008, for consultants, producers, and field workers. In addition, ten preparatory schools attached to the university have established a 4-H program with nearly 1,000 current students engaged in 4-H activities that address improved quality of life for rural citizens. Professors and staff continue exchange visits to Penn State to consult on the development of the 4-H programs. Pennsylvania State partners commented on the need to engage students in agricultural activities at an early age to develop an interest in agriculture and rural development.

The Universidad de Querétaro has established a reputation for extension activities in the area of greenhouse technology resulting from experiments and training begun under the TIES partnership and continuing by the Mexican university since TIES funding ended. Under the TIES partnership, the Mexican university established two academic programs – a master's degree in engineering with a specialization in greenhouse technology, and an associate degree program at the undergraduate level. This partnership relationship continues through the planning for a dual-degree program – a BSci at the Universidad de Querétaro and at West Virginia University by 2011. The Universidad de Querétaro has succeeded in obtaining \$800,000 CONACyT funding for student fellowships, and \$900,000 Ministry of Education funding to build dormitories for students to spend one year at the training site as an experiential learning component of their academic coursework.

The U.S. partners noted that imparting new knowledge and learning new technologies is only one aspect of the partnership goal to transfer technology. At the same time, social acceptance of the technology is required along with the organizational structure to market new products. The Universidad de Guanajuato has become known for its growing reputation in extension work and outreach to local communities. Training activities for producers are now supported by the state government. The university faculty and students are helping a dairy producers cooperative organize as a way to maximize profits and enter new markets; and are advising a women's cooperative to obtain funding to build a greenhouse and learn marketing skills for pepper production and export.

The greenhouse complex at the Universidad de Querétaro provides jobs for local community workers in site management and in the construction and management of greenhouses. The University also provides consulting services and training to local producers of organic fruit and vegetables. As in the case of the Universidad de Guanajuato, institutional activities are being recognized outside the state since this project has contributed to successful greenhouse activities in Guanajuato and San Luis Potosi.

Although the summer internship program with the University of Notre Dame and Universidad de Guadalajara has not continued after the end of the TIES funding, Mexican MBA students, who participated earlier, are now leading the implementation of a new small business development center (SBDC) to provide business planning support for local, small-scale rural producers.

## STUDY DESIGN

**Purpose of the TIES Impact Assessment:** The United States Agency for International Development (USAID) Bureau for Economic Growth, Agriculture and Trade (EGAT) Washington and Higher Education for Development (HED) initiated an impact assessment of a sample of eight higher education partnerships in Mexico under the Training, Internships, Exchanges, and Scholarships (TIES) program. The assessment focused on:

- Human capacity building in Mexican universities
- Institutional strengthening in Mexican universities
- Impact of institutional capacity building on national development goals
- Effects on U.S. university partners

**Higher Education for Development (HED).** HED is a non-governmental partner organization representing the U.S. higher education community through six higher education associations and their constituencies. It receives funding from USAID's EGAT Office under a cooperative agreement between USAID and the American Council on Education, to manage a program of "University Partnerships." Specifically, HED's mission is to assist the nation's six major higher education associations to build partnerships with USAID and help their member institutions foster cooperative development partnerships with colleges and universities abroad. Uniquely positioned to promote the involvement of U.S. higher education in global development, HED encourages international partnerships to address the U.S. government's strategic development goals.

The Training, Internships, Exchanges and Scholarships (TIES) program, established by the USAID Mission and the U.S. Embassy in Mexico in 2001, was "designed to spur social and economic growth in Mexico by supporting institutional strengthening in higher education through education programs, scholarships and university linkages."<sup>8</sup> The first phase of the program, funded by the USAID Mission in Mexico, was managed by HED under Cooperative Agreement No. HNE-A-00-97-00059-00. An internal assessment of the management of the TIES Partnership was conducted by USAID/Washington staff of the EGAT Bureau and submitted to USAID/ Mexico on August 1, 2006. Phase II of the TIES Partnership was conducted under Associate Agreement No. 523-A-00-06-0009-00 between the American Council on Education and USAID Mexico.

**Background.** An original estimate of 35 institutional linkages was proposed by USAID Mexico for the first phase of the TIES partnership. This number had increased to 37 by the end of 2004. In 2005, 10 universities were selected for funding in Phase II of the TIES program under the new Associate Agreement. In 2007, HED staff conducted site visits to six higher education partnerships to fulfill the monitoring and evaluation requirements of the new agreement.

This 2010 impact assessment is the first HED study of eight partnerships that span the years 2002-2005. It examines three of the 17 partnerships awarded under the first competition held in 2002, three of the 13

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<sup>8</sup> U.S.-Mexico TIES ENLACES Partnership, information distributed by USAID/Mexico, November 2001.

partnerships awarded under the second round of funding in 2003, one of the six partnerships awarded in during the 2004 competition, and one of the 10 partnerships from the Phase II competition in 2005. Together these partnerships reflect the changes in the design of the awards between 2002 and 2005 that correspond to the changes in USAID Mexico's Country Plan.

**Information Collection Methods.** This assessment effort – led by Dr. Jane Gore and drawing on the expertise and experience of HED staff members listed on page i – summarized quantitative and qualitative evidence of institutional strengthening from both the Mexican universities and their U.S. partners that led to evidence of impact on local, regional and national development.

Implementing the assessment process required the research teams to:

- First, determine what information was needed to focus the assessment on evidence of impact.
- Second, establish the sources of that information.
- Third, decide the most prudent methods for gathering information.

Major sources of information included:

- *Review of secondary information* from grant applications, sub-agreements between U.S. partners and ACE, progress reports and final end of partnership reports;
- *Responses to a survey questionnaire* sent to U.S. partnership managers;
- *A Roundtable* gathering of project managers representing the U.S. partners; and
- *Site visit observations and interviews* with partners at the Mexican universities.

When reviewing written documents, planners looked for evidence of higher education partnership influence on:

- Human capacity building as defined by USAID;<sup>9</sup>
- Institutional capacity strengthening as defined by USAID;<sup>10</sup>
- Contributions to discipline areas and local development goals;
- Value to U.S. partners; and
- National policy, NGO strengthening, workforce development, and other public service support outside the university to beneficiaries.

Similarly, questions for U.S. and Mexican partners focused on:

- Human capacity building for both U.S. and Mexican participants;
- Institutional capacity strengthening for both U.S. and Mexican institutions;

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<sup>9</sup> USAID: Human capacity defined as knowledge, skills and training for individuals to (a) broaden and increase individual access and completion of education, or (b) specialized proficiency opportunities- long and short- term degrees, exchanges, study tours, technical training (at home and abroad) relevant to their country's development.

<sup>10</sup> USAID: Strengthening is measured as an improvement in the organizational components or operational aspects of higher education institutions that enable the institution to better contribute to host country development. Includes strengthened faculty departments, improved analytical and research capacity, increased university outreach, improved financial management, increased capacity of teacher training institutions especially to fill gaps caused by HIV/AIDS, larger numbers of teachers resulting from rapidly growing school enrollments, and improved application of technology to host country needs.

- Contribution to development needs, e.g., goals related to the USAID development goals;
- Value to the U.S. partner institutions; and,
- Service outside the university, including extension and public service to beneficiaries (See Appendix C for copies of field visit questions)

### *How*

Once written reports were reviewed and summarized, a standard set of questions regarding information and perceptions about human and institutional capacity building, lessons learned, impact, sustainability, value to U.S. partners, and contributions to national development goals were developed for the U.S. partners, and discussed during the roundtable. The same questions were asked of Mexican partners and beneficiaries during site visits to the Mexican universities. The teams visited the partnership sites, which included education institutions and extension locations, where beneficiaries were observed and interviewed.

### *Site Visit Locations*

During September and October 2010, four, three-person teams each visited higher education partnerships in Mexico. (See Figure 1 for partnership locations.)

Team 1: Jennifer Sisane, Carol Robles, and Meena Nabavi traveled to Merida, Yucatán and to Chetumal, Quintana Roo.

Team 2: Carol Robles, Jennifer Sisane, and Lynn Simmonds traveled to Xalapa, Veracruz and Puebla, Puebla.

Team 3: Manny Sanchez, Meena Nabavi and Emily Gartner traveled to Guadalajara, Jalisco and Guanajuato, Guanajuato.

Team 4: Josh Henson, Charlie Koo and Noopur Vyas traveled to Querétaro, Querétaro.

What We Want to Know	Plan for Information Collection for TIES 2010 Impact Assessment					What We Expect to Find Expected outcomes and results
	Secondary Information	U.S. PI Questionnaires	Roundtable for U.S. PIs.	Interviews/site visits-Mexico	Observations	
Review purpose, expected activities, outcomes, goals for partnership human and institutional capacity building	Application, Sub-agreement	PI Responses	Review with PIs in Roundtable Ask about goals in retrospect	Ask Mexican recipients about goals in retrospect	Observe academic environment, staffing at Mexican institution	Objectives for on-going partnership work. Planned activities and outcomes.
Objective-activities, outcomes and results	Summarize reports from files. Reports from annual conferences and TIES conferences	PI Responses	Review and expand on answers to barriers and challenges with PIs in Roundtable	Review with partnership personnel in site visits.	Observe demonstrated outcomes at Mexican institutions	Expected activities and outcomes, both quantitative and qualitative
Expected impact related to national development goals	TIES conference summary	PI Responses	Review and expand on answers with PIs in Roundtable	Verify reported numbers, seek qualitative substantiation with personnel during site visits	Demonstrated impacts at Mexican institution and communities; meet with beneficiaries	Expected impact; quantitative, qualitative. Changes in institutional capacity; evidence of impact on national development goals
Reported recent success stories	Semi-annual and final reports	PI Responses	Ask for updates on success stories in Roundtable	Update success stories with personnel in site visits	Seek Mexican staff, students/beneficiaries most memorable stories	Outcomes: most memorable stories demonstrating impact and sustainability for beneficiaries
Review partnership purpose, outcomes results with U.S. partner; focus on evidence of capacity building	Semi-annual and final reports	PI Responses	Review responses during Roundtable	Interviews	Demonstrated partnership impacts at Mexican institution	Review outcomes, expected impact of partnership to Mexican institutions and to U.S. institutions
Review benefits to local U.S. higher education community	Semi –annual and final reports	PI Responses	Review responses during Roundtable	Interviews	News, media stories, academic publications	Outcomes and impacts to U.S. institutions, results
Review partnership benefits to local U.S. NGO community (outside the university)	Semi-annual and final reports	PI Responses	Review responses during Roundtable	Interviews	News, media stories, academic publications	Outcomes and impact to larger U.S. community
Confirm evidence of human capacity building in Mexican institution	Semi-annual and final reports	PI Responses	Review responses during Roundtable	Interviews	Demonstrated human capacity building among Mexican staff, faculty, students, community members	Outcomes and impact to Mexican staff, faculty and students
Confirm evidence of institutional strengthening in Mexican institution	Semi-annual and final reports	PI Responses	Review responses during Roundtable	Interviews	Visit to Mexican institutions	Outcomes and impact to Mexican institution of higher education
Look for partnership outcomes for beneficiaries outside the Mexican higher education institution	Semi-annual and final reports	PI Responses	Review responses during Roundtable	Interviews	Visits to Ministries, NGOs, government entities; communities; beneficiaries	Outcomes and impacts to Mexican community outside higher education
Include any serendipitous findings, results related to partnership objectives, and overall purpose of award for beneficiaries	Semi-annual and final reports	PI Responses	Review responses during Roundtable	Interviews with appropriate Mexican participants, community members	Observe unexpected outcomes at Mexican institution; to beneficiaries	Unexpected outcomes and impact to both U.S. and Mexican faculty, staff, students, institutions, affects on development policy and goals; benefits to beneficiaries.
Other characteristics of good partnerships, management issues	Semi-annual and final reports	PI Responses	Review responses during Roundtable	Interviews with Mexican recipients	Observe management structures at Mexican institution	Recommendations for making HED TIES program better