

**Annual Progress Report
FY1: April 2007-March 2008**

**UPCD Tier 2 Project Number: S61268-669
(2007-2013)**

Water Management in Bolivia



May 2008

Prepared by:

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1) Project profile

Water management in Bolivia

| Lead Canadian partner | Lead developing country partner |
|--|---|
| University of Calgary Canadian project director: Mr. David Bethune, Faculty of Science Phone number: (403) 220-8029 E-mail address: bethuned@ucalgary.ca | Universidad Mayor, Real y Pontificia de San Francisco Xavier de Chuquisaca, Bolivia Developing country project director: Mr. Normando Guzmán Bedoya, Facultad de Tecnología, Centro de Posgrado Phone number: 011 591-4-645-7139 E-mail address: c/o Brendan Mulligan mulligan@ucalgary.ca |

Link to Bolivia's national development priorities

The project is linked to Bolivia's National Water Resource Strategy, the National Watershed Plan and the National Desertification Plan. It will support the government's efforts to increase the capacity of Bolivians to manage, protect and conserve their water resources.

Project purpose

The overall objective of the project is to reduce ill health associated with the lack of access to clean and sufficient quantities of water. It will contribute to improved management of water resources and increased institutional and human resource capacity and stakeholder partnerships within a supportive policy framework.

Expected outcomes

Expected results include strengthened capacity at the Universidad Mayor Real y Pontificia de San Francisco Xavier in water resource management education, training, research and practice; increased collaboration with communities, municipalities, government agencies, other universities and international organizations and networks; strengthened water policy in Bolivia emphasizing integrated water resource management and groundwater usage, management and protection; and increased in-country synergy on water issues through the creation of a Bolivian University Water Network.

Beneficiaries

The main beneficiaries will be the faculty and students of the Bolivian partner institution, government decision makers and the population in general.

Key activities

The main activities are development of a new M.Sc. program in hydrogeology/water resource management, professor training, delivery of M.Sc. program (education of Bolivian hydrogeologists/water scientists), library and laboratory upgrading, applied community-based

research, policy research, delivery of workshops and short courses on water themes, public education and awareness building, delivery of national forums and conferences and the initiation of a Bolivian water network.

Key results to date

In 2007, the new M.Sc. program was designed and approved by USFX. A program website was created (see <http://www.usfx.edu.bo/posgradocivil/>). In early 2008, the program began its first two-year cycle with 12 students (1 female and 11 male). The students participated in events at USFX on World Water Day (March 22, 2008). Semester courses have been delivered in hydrology, hydrogeology, geographic information systems, geology and research methods. An intensive seminar course was delivered on physical hydrogeology. A film on Bolivian water issues has begun the planning stage with the formation of a technical team of Bolivian water experts. Additional project information can be found at a blog regularly updated by Brendan Mulligan who is based in Sucre for the first four years of the project (see <http://www.ucalgary.ca/blogs/fieldnotes/brendan>).

CIDA priorities addressed

Official development assistance area(s):

Water and sanitation (primary)

Sector(s):

Water resources protection (primary)

Water resources policy and administrative management (secondary)

Policy priorities:

Environmental sustainability (primary)

Project value

Original CIDA commitment: \$1,000,000

Partners' commitments: \$672,327

Project duration

April 2007 - March 2013

2) Key team members and stakeholders

Please indicate the name, institution and role in the project of key team members, in Canada and in the developing country.

University of Calgary

- Mr. David Bethune – Faculty of Science/International Centre (IC); hydrogeology/water resource management; UPCD project management, project co-director/technical advisor/course instructor/research supervisor.
- Mr. Brendan Mulligan (listed for both UC and USFX) – Faculty of Science, hydrogeology; instructor/research coordinator based in Sucre as a professor at USFX.
- Dr. Cathryn Ryan – Geology & Geophysics; hydrogeology, water quality impacts; senior technical advisor/instructor/research supervisor.
- Dr. Laurence Bentley – Geology & Geophysics; hydrogeology; technical advisor/course instructor/research supervisor.

- Dr. Ted Horbulyk – Economics; environmental economics, technical advisor/research supervisor.
- Dr. Maureen Wilson – Social Work; participatory development/gender; technical advisor/course instructor/research supervisor.
- Dr. Lorne Jaques – IC; UPCD projects, participatory development; senior project oversight, participatory development instructor.
- Dr. Eric Dillmann – IC; UPCD projects, community health, senior project oversight.
- Ms. Gloria Eslinger – IC; financial management, senior management and oversight/financial trainer.
- Ms. Anayancy Solis – IC; project procurement, financial training in Spanish.
- Ms. Brianna Ball, project administrative assistant.

University of Waterloo

- Dr. Ramon Aravena (Department of Earth Sciences): aqueous geochemistry, isotope hydrology, water quality/technical advisor/course instructor/research supervisor.
- Dr. David Rudolph (Department of Earth Sciences): hydrogeology, field methods, groundwater resource development and protection.
- Dr. Bruce Mitchell (Department of Geography): watershed management, conflict resolution.

University of San Francisco Xavier (Bolivia)

In early May 2008, the Bolivian project director, Mr. Normando Guzman Bedoya, resigned from the project for personal reasons. USFX has formed a new project committee and will be naming the new project director soon. Current USFX project personnel are as follows:

- Mr. Brendan Mulligan (listed for both UC and USFX) – Faculty of Science, hydrogeology; instructor/research coordinator based in Sucre as a professor at USFX.
- Ms. Monica Clavijo Schmiedl, administrative assistant.
- Mr. Edgar Grandón, Director of the Civil Engineering Department, project oversight.
- Mr. Manuel Ramos, Administrator of the Faculty of Technology, financial management.
- Mr. Eduardo Rivero, Dean of the Faculty of Technology, project oversight.
- Mr. Fernando Ossio, Faculty of Technology, scientific research methods course instructor.
- Mr. Julio Tórréz, Faculty of Technology, hydraulic laboratory assistant.
- Dr. Mary Flores, Academic Coordinator of CEPI, academic oversight.
- Ms. Marlene Aramayo, Centro de Estudios de Posgrado e Investigación (CEPI), Legal Advisor.

3) Status of results template (see below)

4) Analysis of project results

Project context

In early May 2008, the Bolivian project director, Mr. Normando Guzman Bedoya, resigned from the project for personal reasons. USFX has formed a new project committee and will be naming the new project director soon.

Annual results






Strengthened USFX M.Sc. program:







In FY1 USFX designed (with assistance from UC) and obtained internal approval for a new masters of science (M.Sc.) program titled “Masters in Hydrogeology and Water Resource Management. A summary of the program pensum is found below. USFX also created the infrastructure for the M.Sc. program and set-up computers (with internet access) and laboratories. Books, software and field/lab equipment was purchased in FY1.


PENSUM DEL PROGRAMA

| PRIMER SEMESTRE | | | | | | | | |
|-------------------------|---------|---|----|----|----|--------|-------------|-----------|
| No. | SIGLA | ASIGNATURA | HT | HP | HI | SEMANA | SEMESTRE | CRÉDITOS |
| 1 | HRH 411 | Hidrología Aplicada | 4 | 3 | 1 | 8 | 121 | 6 |
| 9 | HRH 412 | Sistemas de Información Geográfica | 3 | 2 | 1 | 6 | 91 | 5 |
| 3 | HRH 413 | Hidrogeología | 4 | 3 | 1 | 8 | 121 | 6 |
| 4 | HRH 414 | Geología Aplicada | 2 | 2 | 1 | 4 | 60 | 3 |
| 5 | HRH 415 | Metodología de la Investigación en Recursos Hídricos | 2 | 0 | 1 | 2 | 36 | 2 |
| TOTAL SEMESTRE | | | | | | | 429 | 21 |
| SEGUNDO SEMESTRE | | | | | | | | |
| No. | SIGLA | ASIGNATURA | HT | HP | HI | SEMANA | SEMESTRE | CRÉDITOS |
| 6 | HRH 421 | Lingüística, género y cultura en Proyectos Hidrogeológicos al Nivel Comunitario | 2 | 0 | 1 | 2 | 36 | 2 |
| 7 | HRH 422 | Geofísica Aplicada a Hidrogeología | 4 | 3 | 1 | 8 | 121 | 6 |
| 8 | HRH 423 | Métodos de Campo | 4 | 3 | 1 | 8 | 121 | 6 |
| 2 | HRH 424 | Hidrogeoquímica | 4 | 3 | 1 | 8 | 121 | 6 |
| 10 | HRH 425 | Proyecto de Tesis I | 1 | 0 | 0 | 1 | 18 | 1 |
| TOTAL SEMESTRE | | | | | | | 417 | 21 |
| TERCER SEMESTRE | | | | | | | | |
| No. | SIGLA | ASIGNATURA | HT | HP | HI | SEMANA | SEMESTRE | CRÉDITOS |
| 11 | HRH 431 | Modelación del Flujo y Transporte de Aguas Subterráneas | 4 | 3 | 1 | 8 | 121 | 6 |
| 12 | HRH 432 | Desarrollo y Manejo de Aguas Subterráneas | 4 | 3 | 1 | 8 | 121 | 6 |
| 13 | HRH 433 | Contaminación y Protección de Aguas Subterráneas | 4 | 3 | 1 | 8 | 121 | 6 |
| 14 | HRH 434 | Seminario sobre la Problemática de Aguas Subterráneas | 2 | 0 | 1 | 2 | 36 | 2 |
| 15 | HRH 435 | Proyecto de Tesis II | 1 | 0 | 0 | 1 | 18 | 1 |
| TOTAL SEMESTRE | | | | | | | 417 | 21 |
| CUARTO SEMESTRE | | | | | | | | |
| No. | SIGLA | ASIGNATURA | HT | HP | HI | SEMANA | SEMESTRE | CRÉDITOS |
| 16 | HRH 441 | Legislación del Agua | 2 | 0 | 1 | 2 | 36 | 2 |
| 17 | HRH 442 | Economía de los Recursos Hídricos | 2 | 2 | 1 | 4 | 60 | 3 |
| 18 | HRH 443 | Planificación y Gestión de Aguas Subterráneas | 2 | 2 | 1 | 4 | 60 | 3 |
| 19 | HRH 499 | Tesis de Grado | 0 | 0 | 11 | 11 | 180 | 9 |
| TOTAL SEMESTRE | | | | | | | 337 | 17 |
| TOTAL PROGRAMA | | | | | | | 1601 | 80 |

The new M.Sc. program began the first semester in February 2008 with 12 full-time students (1 female, 11 male):

| | Student Name | Age | Education | Work Experience |
|---|-----------------------------------|------------|--------------------------|--|
|  | Kiene Antonio Barroso Chulve | 24 | Civil Eng. U.S.F.X | Civil Engineer (Sanitation), water prospecting and exploration. Consultant responsible for sanitation unit. Teaching assistant at U.S.F.X |
|  | Juan Guillermo Chacon Bustillos | 39 | Geo. Eng. Tomas Frias | Geologist in the firm Sumaj Huasi Junior Geophysicist in the firm Sergeotec Researcher in the firm Dicit |
|  | Moisés Francisco Crespo Salamanca | 27 | Civil Eng. U.S.F.X. | Consultant in firm Proesti, Fundesubo, Sedcam |
|  | Mauricio Fernando Limpías Camacho | 32 | Civil Eng. U.S.F.X | President of firm Incosur |
|  | Luis Eugenio Navarro Navarro | 33 | Civil Eng. U.S.F.X | Consultant: Fundacion Pasos, Proisaba, FPS, Consultant: Ossio Rellini CMFOR, Consultant: Jorge Gabriel Ortiz, Consultora Sacbo, Municipal government of Yamparaez, Proesti, Conasing, Consudsingtop, Incotec, CIIC, Teacher: Tecnológico Aleman, U.S.F.X, Cibertec |

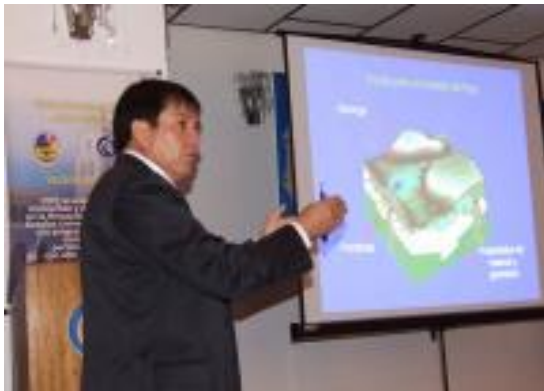
| | | | | |
|---|------------------------------------|----|------------------------|---|
|  | Frank Américo Ramos Barrios | 30 | Civil Eng. U.S.F.X | Responsible for project unit, and waterworks for Municipality of Ixiamas Works resident: Pisiga-Oruro, Llica -Potosí, firm Julian Medrano Ravelo-Sucre Responsible for sectorización zone central Sucre |
|  | Carlos Calixto Rojas Quenallata | 39 | Civil Eng. U.M.S.A. | Supervisor of waterworks. |
|  | Hugo Luis Soliz Flores | 30 | Civil Eng. U.S.F.X | Proyectista diseño final refaccion de la recoleta Waterworks technician for firm Constructora R&P |
|  | Boris R. Valda Vargas | 30 | Civil Eng. U.S.F.X | Technician for firm Reingeniería Total, Ardico, Inarc Waterworks technician ONG MUCODE Waterworks supervisor FUPAD Project director Emcoval Waterworks supervisor Emcoval |
|  | Maciel Rosario Vega Marquiegui | 31 | Civil Eng. U.S.F.X | Director of waterworks in firm Constructora Matersa Supervisor of internal installations of household gas in YPFB |
|  | Ronald Zapata Vásquez | 25 | Civil Eng. U.S.F.X | Recent graduate. |

| | | | | |
|---|-------------------------|----|-----------------------|---|
|  | Ariel Zeballos Leaño | 33 | Civil Eng. U.S.F.X | Supervisor of Works for Municipality of Culpina Technician for Municipality of Culpina Director of waterworks for Municipality of Culpina |
|---|-------------------------|----|-----------------------|---|

Semester courses taught in FY1 (professor indicated):

- Physical hydrogeology (Brendan Mulligan)
- Applied Hydrology (Helmer Rodriguez)
- Geographic Information Systems (Julio Cesar Magne)
- Applied Geology (Pedro Lopez)
- Research Methods in Water Resources (Fernando Ossio)

Short courses/seminars/workshops taught in FY1:



Dr. Jaime Gárfias taught a one-week intensive module in physical hydrogeology. Dr. Garfias is from Bolivia and has a PhD in hydrogeology from the University of Laval. He currently works as a professor at the Interamerican Centre for Water Resources at the UAEM, Toluca Mexico)

Results variance

None to date.

Implementation variance

The following activities were not implemented in FY1 as planned:

1000: M.Sc. Program at USFX: Recruitment/Training of New USFX Professors: the two project professors to be trained in Canada at the MSc level were to be selected in 2007 and start their MSc programs at UC and UW in Sept/2008. However, there has been a delay in the approval from USFX for these two trainees and to date this approval has not been provided.

4000: Development of Bolivian Water Network: Construction of Website: This activity has been delayed until mid-2008.

Spin-off activities and unexpected results

The following activities occurred but were not planned:

- Brendan Mulligan has developed a strong collaboration with the Universidad Mayor de San Andrés (La Paz) through two events planned for FY2: a) hydrogeology field methods short course in August 2008 and b) arsenic in groundwater and national groundwater forum in October 2008.
- Nicole Wilson volunteered as the coordinator of the planned video on Bolivian water issues. Ms. Wilson contacted key Bolivian water experts to form technical team and plan film.

5) Communication products

The project produced the following communication products in FY1:

- USFX new MSc program website (see <http://www.usfx.edu.bo/posgradocivil/>) launched in 2007.
- Brendan Mulligan began a regularly updated “blog” on the University of Calgary website (see <http://www.ucalgary.ca/blogs/fieldnotes/brendan>) and he is providing regular updates of the project activities as well as his personal experience in Bolivia.



USFX students and professors participate in World Water Day events at USFX (March 22, 2008; see photo). To mark the event, our students were asked to prepare a display for Sucre’s central plaza. Our hope was that they would teach something to the local community and make our project more visible while they were at it. The students took the initiative to build a demonstration model of a simple and relatively inexpensive water storage tank for use in rural and suburban communities that lack access to a central distribution system. Their presentation was really impressive and showed their interest in both the technical and the social aspects of water issues, which bodes very well for their thesis projects.

Project inauguration ceremony at UC attended by the UC president and the federal minister of industry. David Bethune gave a presentation and was interviewed for news coverage by CTV news and 770 Talk Radio. An article was also written with photos for the UC website homepage. An article was also written for the USFX magazine (see below...)

University of Calgary Press Release (Nov. 16, 2007)

U of C research team heads to Bolivia to tackle water crisis



Harvey Weingarten, president of the University of Calgary, David Bethune, a renowned water researcher in the Faculty of Science, and the Honourable Jim Prentice, Federal Minister of Industry and MP (Calgary North-Centre), announce a six-year project designed to increase the number of water scientists in Bolivia. / Photo by Ken Bendiktsen

CIDA commits \$1 million to improve quality and availability of water

A group of University of Calgary researchers is teaming up with their counterparts in Bolivia to ensure residents of the South American country have improved access to clean water and to reduce the prevalence of negative water-related health effects.

The \$1-million project, announced today at the U of C, is funded by the Canadian International Development Agency, and is a key piece of Bolivia's ongoing efforts to overhaul its water supply and sanitation.

"This project will build Bolivians capacity for water management, protection, and conservation, and I am pleased to see that the

University of Calgary will be sharing Canadian know-how and expertise in this vitally important area," says the Honourable Jim Prentice, Minister of Industry and MP Calgary North-Centre, who officially announced the funding.

University of Calgary President Harvey Weingarten says the project is one of many CIDA-funded initiatives that illustrate the U of C's commitment to share resources and expertise with other countries around the world.

"The Bolivia Water project is an excellent demonstration of how the U of C community is aiding in the development of other communities around the world by using our resources to enable others to develop theirs," said Weingarten.

"The Government of Canada is pleased to partner with the University of Calgary on this water management project, which will improve the health and quality of life of people living in Bolivia," said the Honourable Beverley J. Oda, Minister for International Cooperation. "We are proud to be actively enhancing our engagement in the Americas to help build a more democratic, prosperous and secure hemisphere."

David Bethune, research associate, Faculty of Science, and team leader for the Bolivia Water Project, is committed to improving the quality of water in Bolivia, an integral step towards improving the health of approximately 10 million Bolivians.

"Right now, about 70 percent of Bolivians are getting their supply of water from groundwater through wells and springs, however, there are only a handful of Bolivians with any training in groundwater and no educational opportunities within Bolivia. By comparison, only about 30 percent of Canada's water supply is from groundwater," said Bethune.

Bethune, whose expertise in areas of water supply and sanitation has been tapped by countries such as Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Malawi and Ghana, is partnering with the Universidad Mayor, Real y Pontificia de San Francisco Xavier (Sucre) to develop human resources for a country in desperate need of clean water.

The six-year project is designed to increase the number of water scientists in the country so they can solve problems related to clean water supply, watershed management and water pollution.

U of C MSc graduate student Brendan Mulligan will play an integral role from the U of C team in Bolivia where he will be based for the first four years of the project as a hydrogeology professor. Beginning in February 2008, he will teach courses and supervise applied research conducted by Bolivian students within a team of Bolivian professors.

“We are helping Bolivia offer graduate-level education in water resource management that emphasizes good science and local community-based solutions which require an understanding of socio-economic, legal, institutional and political realities of water management,” said Bethune.

Bethune says the project will see the creation of water resource management education, training, research and the development of a Bolivian water network that will connect all Bolivian universities working on water resource management to each other and to government agencies, donors, municipalities and communities.

The CIDA funding, offered through the University Partnerships in Cooperation and Development Program, runs over six years (2007 to 2013). The total value of the project is estimated at \$1.7 million, taking into account in-kind donations from other in-kind commitments.



Rubbing shoulders with Canadian bureaucrats at the official project inauguration. L-R: Geneviève des Rivières (Ambassador), Alberto Palacios-Hardy (Head of Aid), and me.

Project inauguration ceremony at USFX. The event was held in January 2008 at the office of the rector (university president) in one of the most beautiful buildings in Sucre. The University of San Francisco Xavier, our partner institution, was founded in 1624 and thus has no shortage of heritage buildings around town. The inauguration was capped by a visit from the Canadian ambassador to Bolivia, along with the Head of Aid and First Secretary from the Canadian embassy in La Paz. This was the first occasion in which a Canadian ambassador visited Sucre so we were honored

Text of Article published in USFX magazine:

CON APOYO CANADIENSE

Inauguran proyecto sobre recursos hídricos

El proyecto tendrá una duración de seis años a partir de este 2008

Sucre/CORREO DEL SUR

Miércoles 30 de enero del año 2008

Un acuerdo de cooperación entre la Universidad San Francisco Xavier y la Universidad Calgary de Canadá posibilitó la apertura del Proyecto "Manejo de Recursos Hídricos en Bolivia".

Ayer, martes, en un acto especial, en el que participaron las autoridades universitarias, judiciales, la embajadora de Canadá, representantes consulares y los responsables del Proyecto de ambas Universidades, se dio por inaugurada las operaciones del proyecto.

En nuevo emprendimiento de la Universidad pertenece al grupo de proyectos Tier 1 y Tier 2 financiados por la Agencia Canadiense para el Desarrollo Internacional (ACDI) a través de la asociación de Universidades y Colegios de Canadá (AUCC).

La directora de Relaciones Internacionales de San Francisco Xavier, Noemí Valdivieso, informó que el objetivo del Proyecto es mejorar el nivel de conocimientos y el desarrollo de capacidades, a través de los componentes Programa de maestría, Educación continua, Fortalecimiento de políticas de agua, Creación de redes de agua, Desarrollo educacional, Gestión y Administración, Monitoreo y evaluación.

El proyecto tiene un financiamiento de 1 millón de dólares canadienses, la contraparte de 429.000 dólares canadienses otorgados en especie por la Universidad de Calgary y la contraparte de 239.000 dólares americanos de San Francisco Xavier en especie.

Valdivieso manifestó que el emprendimiento tendrá una duración de seis años a partir de 2008. Durante este tiempo el Proyecto realizará una serie de actividades, entre otros, como desarrollo de programas de maestría en recursos hídricos superficiales y subterráneos, capacitación de docentes de San Francisco Xavier en Canadá para el desarrollo de programas de maestrías en aguas subterráneas.

Por otra parte, la embajadora de Canadá, Geneviere de Rivieres recibió el título de "Fray Juan Frías y Herrán" con mención en el área Académica, Educación, Investigación, Ciencia y Tecnología por su apoyo a la comunidad universitaria.

**UPCD Tier 2 annual progress report
Status of results (June 2008)**

| | | |
|---|--|--|
| Reporting period: April/2007-March/2008 | Canadian lead institution University of Calgary | Country Bolivia |
| Project number S61268-669 | Project title Water Management in Bolivia | |
| Intended results | Indicators | Cumulative outcome and outputs achieved (use indicators) |
| <p>Outcome 1: Strengthening and expansion of an existing M.Sc. program “International Water Resources” for professionals working in the water resource sector (government, university, NGO’s and private sector).</p> <p>Output 1.1 USFX has designed, obtained internal approval and is implementing its strengthened M.Sc. program by early 2008.</p> <p>Output 1.2 USFX has developed the human and physical resources to independently deliver its M.Sc. program by project-end.</p> <p>Output 1.3 USFX successfully recruits, trains and graduates high-caliber Bolivian M.Sc. students and completes two (two-year) M.Sc. program cycles during the project.</p> <p>Output 1.4 USFX students and faculty are trained in gender-sensitivity and community-development and conduct applied “community-based field projects” in collaboration with key stakeholders (in particular municipalities and government water agencies).</p> | <p>Outcome indicators 1</p> <p>1.1 Institutional support: Number of USFX professors/staff involved. Number of new faculty positions created. Infrastructure (e.g. offices, laboratories, computers, transportation) adequate. Administrative support adequate.</p> <p>1.2 External support: Extent to which USFX secures alternative sources of funding (e.g. for student scholarships, community-based research or faculty training) for the long-term sustainability of the M.Sc. programs.</p> <p>1.3 Program recognition/reputation. Increasing number of M.Sc. program applicants (f/m) and students (f/m) with time. Evaluation of the M.Sc. program by a recognized national academic body.</p> <p>1.4 Extent of integration of gender issues in program curriculum.</p> <p>Output indicators 1.1: Number of new faculty trained and hired to permanent faculty positions at USFX.</p> <p>Output indicators 1.2: Number of students (f/m) in USFX M.Sc. program (applicants, accepted, graduated). At least 70% of M.Sc. students successfully complete all components of programs and graduate in final year of project (% increases over time).</p> <p>Output indicators 1.3:</p> <p>1.3.1 Number of students (f/m) and faculty (f/m) trained by subject.</p> | <p>Outcome 1: project too early for full realization of result however the new MSc program has been approved and is up-and-running.</p> <p>Outcome indicator 1.1: USFX has created the infrastructure for the MSc program and set-up computers and laboratories.</p> <p>Outcome indicators 1.2-1.4: project at early stage.</p> <p>Output 1.1: completed on-time: USFX designed, obtained internal approval and began implementing its strengthened M.Sc. program in early 2008.</p> <p>Output indicators 1.1: Zero faculty have been trained and zero permanent faculty positions created to date due to internal delays at USFX.</p> <p>Output indicator 1.2: USFX has 12 students (1 female, 11 male) in the new MSc program. There were 42 applicants.</p> <p>Output indicators 1.3: 12 MSc students trained in semester courses (Physical Hydrogeology, Applied Hydrology, Geographic Information Systems, Applied Geology, Research Methods in Water Resources) and seminar course (physical hydrogeology) and 25 professionals trained in the seminar course. Project too early for gender and community development indicator.</p> <p>Output indicators 1.4: USFX is gradually collaborating with an increasing number of stakeholder organizations in the water sector. Project too early for gender indicator.</p> |

| | | |
|--|---|---|
| | <p>1.3.2 Students, professors and graduates demonstrate knowledge of gender-sensitivity and community development in their work.</p> <p>Output indicators 1.4:</p> <p>1.4.1 Increasing number of stakeholder organizations collaborated with over time (in particular municipalities and government water agencies) and positive feedback regarding collaboration.</p> <p>1.4.2 Extent of integration of gender issues in curriculum.</p> | |
| <p>Outcome 2: A sustained continuing education program at USFX in hydrogeology and water resource management for professionals, technical personnel and community-level facilitators working in the water resource sector.</p> <p>Output 2.1 USFX is prepared to offer continuing education programs through a series of on-going short courses, seminars, workshops and distance education courses directed toward municipal and national government technicians and professionals.</p> <p>Output 2.2 USFX has assembled teams of instructors to deliver programs.</p> <p>Output 2.3 Beginning in early 2008, USFX is delivering a minimum of three short courses/workshops/seminars per year training 20-50 students per course covering a variety of water resource and water supply related themes. At least 50% of the short courses will be delivered on-location in municipalities.</p> | <p>Outcome indicators 2</p> <p>2.1 Institutional support from USFX: Number of USFX professors instructing in courses. Number of short courses delivered per year by USFX professors versus non-USFX instructors.</p> <p>2.2 Program recognition/reputation within Bolivia. Perception of importance and effectiveness of continuing education program by participants. Increasing number of short course students (f/m) with time.</p> <p>2.3 Extent of integration of gender issues in program curriculum.</p> <p>Output indicators 2.1</p> <p>2.1.1 Number of short courses delivered. Number delivered in rural municipalities.</p> <p>2.1.2 Increasing number of applicants and students over time (f/m).</p> <p>2.1.3 Increasing independence of USFX for course delivery (less dependant on outside instructors) over time.</p> <p>2.1.4 Increase in number of stakeholder organizations sending students to short courses over time.</p> <p>Output indicators 2.2</p> <p>2.2.1 Number of courses delivered and number of students (f/m) trained.</p> <p>2.2.2 Student feedback indicates courses are of high quality, instructors good and course themes relevant to student priorities and they have applied new knowledge/skills in their work.</p> | <p>Outcome 2: The first continuing education seminar was given in FY1 by Dr. Jaime Gárfias (a Bolivian hydrogeology professor working at the UEAM Toluca Mexico) who taught a one-week intensive module in physical hydrogeology.</p> <p>Outcome indicators 2.1-2.3: project too early.</p> <p>Output indicators 2.1: one seminar course delivered (see above).</p> <p>Output indicators 2.2: Student feedback on Dr. Garfias seminar: “In my opinion, the course was extremely interesting and very beneficial, especially for the content directed towards real, site-specific projects...”, “Dr. Gárfias' course opened our eyes to issues of contamination and his experience has shown that remediation of contaminated aquifers is costly and long-term; the application of a policy of prevention will serve us better than a policy of remediation...”, “The course was very useful especially for our developing country; it allowed us to consider real problems related to aquifers and their management...”, “The course was eye-opening for many of us.”</p> |

| | | |
|---|--|---|
| | 2.2.3 Extent of integration of gender issues in curriculum. | |
| <p>Outcome 3: Strengthened water policy in Bolivia emphasizing integrated water resource management and groundwater usage, management and protection.</p> <p>Output 3.1 A national-level review of critical policy needs to protect and conserve groundwater resources in Bolivia.</p> <p>Output 3.2 Improved enforcement of national water laws and execution of policy directed toward rural communities and municipalities in Bolivia.</p> <p>Output 3.3 USFX professors/students have gained significant experience that has further strengthened the M.Sc. and continuing education programs with respect to water policy.</p> | <p>Outcome indicators 3</p> <p>3.1 Number and type of policy research projects or activities carried out and extent to which they have contributed to local or national water policy strengthening.</p> <p>3.2 Number and type of improvements made to water policy as a result of the project.</p> <p>3.3 Extent of integration of gender issues in national water policies and programs.</p> <p>Output indicators 3.1: Degree of stakeholder satisfaction with their water policy related collaboration with USFX (interview with key stakeholders).</p> <p>Output indicators 3.2: M.Sc. and Continuing Education programs content includes water policy content (curriculum review).</p> | <p>Outcome indicators 3: project too early. However, Nicole Wilson (a Canadian who lived in Bolivia) volunteered in FY1 as the coordinator of the planned video on Bolivian water issues. In FY1, Ms. Wilson contacted key Bolivian water experts to form technical team and plan film.</p> <p>Output indicator 3.1: project too early.</p> <p>Output indicator 3.2: MSc program curricula include water policy content.</p> |
| <p>Outcome 4: Creation of a Bolivian University Water Network consisting of all Bolivian universities (public and private) involved in teaching and research on water issues.</p> <p>Output 4.1 A Bolivian University Water Network is initiated by all interested members and a website is created.</p> <p>Output 4.2 Member universities are aware of each others activities and collaborate/share resources when feasible.</p> | <p>Outcome indicators 4</p> <p>4.1 Quality/utility and member usage of network website.</p> <p>4.2 Number and type of collaborations involving two or more Bolivian universities.</p> <p>Output indicator 4.1: Creation of network website in Year 1 and subsequent population with member information and utility. Number of website visits.</p> <p>Output indicator 4.1: Number and type of Bolivian university collaborations increases with time.</p> | <p>Outcome indicators 4: Bolivian water network website not yet constructed. Brendan Mulligan has developed collaboration with the Universidad Mayor de San Andrés (La Paz) through two events planned for FY2: a) hydrogeology field methods short course in August 2008 and b) arsenic in groundwater and national groundwater forum in October 2008.</p> <p>Output indicators 4.1 and 4.2: project too early.</p> |