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EL ALTO LAKE TITICACA POLLUTION MANAGEMENT ACTIVITY

*(Manejo de la Contaminación en el Eje Hidrográfico El Alto –
Lago Titicaca): PROLAGO*

Mid-Term Evaluation Report
USAID/Bolivia – October 17 – 28, 2011

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Table of Contents

- 1. Exclusive Summary 3**
- 2. Introduction..... 7**
- 3. Scope and Methodology Introduction 10**
- 4. Analysis and Findings 11**
- 5. Conclusions 26**
- 6. Commendations and Recommendations Conclusions 27**

ANNEX

- ANNEX A: Statement of Work 38
- ANNEX B: Evaluation Team Workplan..... 47
- ANNEX C: Memo 49
- ANNEX D: Interview Questions 51
- ANNEX E: Interview List 53
- ANNEX F: Sustainability index of PROLAGO field activities 55

1. Executive Summary:

In October 2007 USAID-Bolivia commissioned a Biodiversity Threats and Activity Options Assessment to investigate the potential for biodiversity programming within the greater Lago Titicaca ecosystem. The assessment identified the Lake as a nationally, regionally, and globally important area for biodiversity conservation that was currently under threat from a variety of sources, particularly pollution from agricultural areas on the lakeshore as well as industrial pollution and sewage from El Alto. Cohana Bay was identified as one of the most negatively impacted parts of the lake from these threats.

The assessment also identified the best opportunities for USAID to address those threats, including reducing the threats of both pollution sources. From this the PROLAGO project was developed and awarded in 2008 with Biodiversity Earmarked funding. The initial award was for a three-year contract, extended for two additional years, with an expected end in 2013.

While most of the 25 rivers feeding Lake Titicaca carry minimal amounts of pollution to the largely unpolluted lake, degraded areas of the Lake Titicaca watershed are being threatened by pollution from multiple point and nonpoint sources in urban (City of El Alto) and rural areas. These include households, industrial and small businesses, mines, and agricultural and livestock operations, which combine to produce a toxic water quality cocktail of heavy metals, organic waste, mineral salts, and pathogens. The resulting water pollution contributes to anoxic conditions that are detrimental to fish, accelerates the process of eutrophication in shallow bays and lagoons and stimulates excessive growth of plants, and increases bioaccumulates in aquatic flora and fauna. Overfishing and the introduction of exotic species has further stressed or endangered native species that compete for habitat.

Poverty, which has not been reduced in the altiplano significantly in the last 20 years, drives land-use behavior that results in overuse of natural resources. Flawed governance structures and limited capacity to regulate pollution or land use adds layers of complexity to the challenges of addressing the major threats to the watershed's fragile *puna*ecosystem and biodiversity.

PROLAGO, implemented by IRG, pursues the following two objectives: (1) Reduce threats negatively impacting key biodiversity targets in El Alto – Lake Titicaca region; and (2) Improve the environmental health and quality for residents in targeted areas within the El Alto – Lake Titicaca region.

Through achieving the objectives mentioned above, PROLAGO is catalytic in helping Bolivians build solid environmental development using a landscape approach based on (1) clean production, (2) watershed management, (3) integrating biodiversity conservation with pollution management and, (4) use of land best practices, all by using a landscape approach.

Program has three sub components: (1) Address the pollution from El Alto industries and faulty municipal waste management (led by CPTS); (2) Address the pollution from agricultural areas along the lakeside (led by *Ecología y Empresas*); and (3) Communications (led by Manoff Group).

This Evaluation was requested by USAID to provide a mid-term assessment of the PROLAGO program. Its purpose is to identify which project components and aspects are working well and

why, which are not and recommend remedial actions, and evaluate possibility of a Phase II of the Program. Results and recommendations from this evaluation will be used to fine tune and adjust objectives and deliverables for the remainder of the project. It was considered especially important to evaluate the management and sustainability of the program.

The number one bottleneck/limitation faced by the Program is the attitude of the central government towards USAID. This has limited their partnership with many official bodies, and often caused unplanned periods where activities cannot proceed due to the political sentiments at that time.

Positive change of lower watershed beneficiaries' attitudes regarding the realization that they are both a cause of water quality problems (primarily nutrient loading) and a part of the solution. Rural activities designed to promote collection of water contaminating manure and its conversion into useful products (methane, humus, and "biof") has been very successful; viewed as sustainable over the long-term. Development of rural veterinary technicians viewed as sustainable; technicians charge for their services, much demand for animal health assistance.

Behavior changes amongst lower watershed beneficiaries have not been immediate nor uniform; working directly with the majority of the owners of the +/- 20,000 cattle within the lower watershed is not possible within the five year time horizon of the Program; nor is it possible to reach the majority of medium- to small-scale industries within the four industrial sectors of interest in El Alto. To date the Program has made significant, positive changes amongst a relatively small sub-set of the owners of the +/- 20,000 cattle and amongst the selected eight large-scale industries in El Alto.

Program has been effective in focusing messages on productivity and the immediate benefits that new practices create, and not on long-term messages; in keeping with desire to achieve Program objectives within the five year time frame. Activities focused on the benefits for participants, including municipal governments, industries, and individual farmers.

Program activities (lower and upper watershed) designed to be relatively easy to replicate and executed with local abilities in order to achieve wide-spread diffusion. Program design and implementation has placed emphasis on commitment of counterpart resources by the beneficiaries, ensures local buy-in/"ownership". Technical assistance in all areas (industry, producers' associations, independent producers) being implemented under appropriate environmental management and Cleaner Production criteria, enabling compliance with environmental standards and creating advantageous economic opportunities and greater productive efficiency.

Solving water quality issues within Cohana Bay and El Alto is a longer-term proposition, ProLago's relatively small-scale program of providing many discrete field activities working to improve water quality and biodiversity is a significant step in the right direction. USAID needs better cooperation/integration with the GOB, prefecture, other municipalities, and NGOs to address Cohana Bay water quality in a comprehensive manner.

Commendations:

1. ProLago development model effective – multiple, smaller-scale activities summing to a larger impact on water quality. "Do few things well" another way of describing field activities.

2. Partner *Centro de Promoción de Tecnologías Sostenibles*(CPTS) targeting work with industries across the four sectors of interest (tanneries, meat processing, beverage, and dairy) that are the largest polluters in terms of water quality.
3. CPTS methodology of working with pilot industries to demonstrate cleaner production technologies and the subsequent transfer to those technologies to smaller businesses in each sector of interest.
4. Program to undertake a study of Cohana Bay sediments to determine the presence or absence of heavy metals; El Alto tanneries a primary producer of heavy metals.
5. Municipality of Pucarani: (1) Now views ProLago as a strategic partner; not always the case. (2) Successful dialogue with Municipality opened the door for Swisscontact to begin direct interactions with the municipality in the area of payment system options for delivery of public services.
6. *Universidad Publica de El Alto* agreement to obtain thesis students to accomplish discrete investigations for PROLAGO.
7. PROLAGO agreement with GIZ that formed a strategic partnership for the construction of biodigesters.
8. Work with a local university (*Universidad Católica – Batallas*) to complete a study to assess human health associated with environmental health and in the area of child health.
9. Manure is becoming to be viewed as an economic resource by beneficiaries; primarily as raw material for vermicompost and to a lesser extent for biodigesters.
10. Program methodology for animal (cow) health whereby early in the Program there was a 50/50 cost share with farmers and over time farmers bear all the costs.

Recommendations:

1. Plan for a “phase two” of the Program. Phase II would work in two primary areas: (1) new municipalities to implement water contamination reduction activities (use of cattle manure) and (2) focus on mid- to small-scale El Alto industries to implement proven cleaner production technologies, within existing four sectors.
2. Within the El Alto industry sector, recommend Program develop a competition to encourage small- and medium-scale industries to adopt proven cleaner production technologies.
3. Obtain buy-in from four El Alto industrial sectors to disseminate cleaner production technologies downward to small- and medium-scale actors within each sector.
4. Analyze the El Alto cleaner production situation to determine if CPTS has an adequate campaign for the widespread promotion of clean production technologies amongst small- and medium-scale businesses within the four industrial sectors of interest.
5. CPTS needs to improve coordination with Program’s communications team to develop a realistic plan to widely distribute cleaner production technologies material amongst small- and medium-scale businesses within each industrial sector.
6. “Data Quality Assessment” (DQA) not done for Program to date; USAID/Bolivia needs to schedule a DQA as soon as possible.
7. Funding constrained for Component 3; analyze existing budget to determine if it is adequate to meet forthcoming need to widely distribute El Alto cleaner production technologies.
8. Integrate Global Climate Change (GCC) “Adaptation” concepts into Program, including one or more standard GCC indicators. GCC Adaptation funding not necessary to incorporate adaptation strategies within a Program; opportunity for Mission to account for “indirect” GCC/Adaptation funding.

9. Integrate Global Climate Change (GCC) “Clean Energy” concepts to take advantage of “indirect” Clean Energy funding opportunity (Mission receives no “direct” GCC/Clean Energy funding) due to methane production/use from installed biodigesters.
10. Within the El Alto industry sector, develop a competition to encourage small-scale industries to adopt proven cleaner production technologies.

2. Introduction:

In October 2007 USAID-Bolivia commissioned a Biodiversity Threats and Activity Options Assessment to investigate the potential for biodiversity programming within the greater Lago Titicaca ecosystem. The assessment identified the Lake as a nationally, regionally, and globally important area for biodiversity conservation that was currently under threat from a variety of sources, particularly pollution from agricultural areas on the lakeshore as well as industrial pollution and sewage from El Alto. Cohana Bay was identified as one of the most negatively impacted parts of the lake from these threats (see Figure 1. Map of project area).

The assessment also identified the best opportunities for USAID to address those threats, including reducing the threats of both pollution sources. From this the PROLAGO project was developed and awarded in 2008 with Biodiversity Earmarked funding. The initial award was for a three-year contract, extended for two additional years, with an expected end in 2013.

The original Contractor SOW details the threats and underlying assumptions guiding an effective program:

While most of the 25 rivers feeding Lake Titicaca carry minimal amounts of pollution to the largely unpolluted lake, the degraded areas of the Lake Titicaca watershed are being threatened by pollution from multiple point and nonpoint sources in urban and rural areas. These include households, industrial and small businesses, mines, and agricultural and livestock operations, which combine to produce a toxic water quality cocktail of heavy metals, organic waste, mineral salts, and pathogens. The resulting water pollution contributes to anoxic conditions that are detrimental to fish, accelerates the process of eutrophication in shallow bays and lagoons and stimulates excessive growth of plants, and increases bioaccumulates in aquatic flora and fauna. Overfishing and the introduction of exotic species has further stressed or endangered native species that compete for habitat.

Poverty, which has not been reduced in the altiplano significantly in the last 20 years, drives land-use behavior that results in overuse of natural resources. Flawed governance structures and limited capacity to regulate pollution or land use adds layers of complexity to the challenges of addressing the major threats to the watershed's fragile *punaecosystem* and biodiversity. In our experience, addressing these constraints is crucial to achieving sustainable results. The contractor includes targeted interventions that will strengthen municipal government capacity to monitor, implement, and enforce relevant environmental regulations and apply integrated watershed management methodology.

The PROLAGO project, implemented by IRG, pursues the following two objectives:

- Reduce threats negatively impacting key biodiversity targets in El Alto – Lake Titicaca region.
- Improve the environmental health and quality for residents in targeted areas within the El Alto – Lake Titicaca region.

Within these objectives, the project to achieve:

- 1) Improved culture of conservation.
- 2) Increased awareness of the environmental, economic, cultural and social benefits of a cleaner Lake Titicaca.

- 3) Integrated watershed management.
- 4) Improved agricultural and livestock practices.
- 5) Reduced pollution sources.
- 6) Increased local government capacity to enforce regulations, issue permits, and make inspections.

Through achieving the objectives mentioned above, PROLAGO will be catalytic in helping Bolivians build solid environmental development using a landscape approach based on (1) clean production, (2) watershed management, (3) integrating biodiversity conservation with pollution management and, (4) use of land best practices, all by using a landscape approach.

Program sub components:

- 1) Addressing the pollution from El Alto industries and faulty municipal waste management (led by *Centro de Ecología y Empresa and supported by Promoción de Tecnologías Sostenibles [CPTS]*).
- 2) Addressing the pollution from agricultural areas along the lakeside (led by International Resources Group (IRG-L3)).
- 3) Communications (led by Manoff Group).

Key activities in the prevention and control of rural and urban pollution:

1. Solutions to reduce organic contaminants in Cohana Bay through Integrated natural resources management;
2. Strengthening the Social Public Water and Sanitation Company (EPSAS);
3. Strengthening Puchukollo water treatment plant through the Clean Development Mechanism (CDM) – *not realized due to political concerns*;
4. Intervention in Villa Ingenio (lixiviation ponds) - *not realized due to political concerns*;
5. Solid waste interventions in Municipality of Viacha;
6. Industrial pollution control in El Alto (CPTS);
7. Monitoring of water quality in the Cohana Bay watershed.

Relevant advances – Component 1:

- Closure of Viacha garbage dump and opening of the new landfill site consolidated as works of the Municipal Government of Viacha;
- Four monitoring campaigns systematized, protocol for reports established and database geo-referenced;
- Information gathered for priority industries in El Alto; CPTS (Sustainable Technologies Promotion Centre) is working with Cleaner Production programs which will produce results within the next year;
- Support given to EPSAS is opening new possibilities for interventions in industry (specialist water treatment plants, etc.);
- Feasibilities of biodigester technology demonstrated on the Altiplano;
- Efforts to build a leachate treatment plant at Villa Ingenio (El Alto landfill), to have a significant impact on the reduction of BOD and COD (down from 50,000 mg to less than 2500 mg of BOD);
- Evaluation of Municipality of Pucarani sewage system and to construct a sanitary landfill

Relevant Advances - Component 2:

- Biodiversity monitoring system established for birds, benthic fauna, macrophytes, and bioindicators defined;
- Support for the construction of 159 stables, built to move cattle away from the lake;
- 73 biodigestors built, producing energy (methane combustion) and foliar fertilizer;

- 121 vermicomposters producing humus; 16,000 kg commercialized and 100 more vermicomposters under construction;
- 2.65 tons of manure processed per day amongst these practices;
- 721 families participating in improved livestock management activities:
 - Promotion of decreasing the number cattle along the lakeshores;
 - Techniques to increase balanced cattle feeding (pilot demonstrations), and fodder and *titora* reed management (213 producers are applying techniques);
 - Genetic improvement via artificial insemination of 75 cows;
 - Animal health campaigns (8) carried out per lower watershed community.

Relevant Advances - Component 3:

- 779 authorities from the upper and lower areas of the river basin received training;
- Participation of 120 teachers in training sessions.
- Implementation of school initiatives regarding caring for the Katari river basin and environmental fairs with participation of over 2000 children;
- Communication and education campaigns (5) executed;
- More than 85 promotional and information materials produced.

This Evaluation was requested by USAID to provide a mid-term assessment of the PROLAGO project. Its purpose is to identify which project components and aspects are working well and why, which are not and recommend remedial actions, and evaluate possibility of a Phase II of the Program. Results and recommendations from this evaluation will be used to fine tune and adjust objectives and deliverables for the remainder of the project. It was considered especially important to evaluate the management and sustainability of the project.

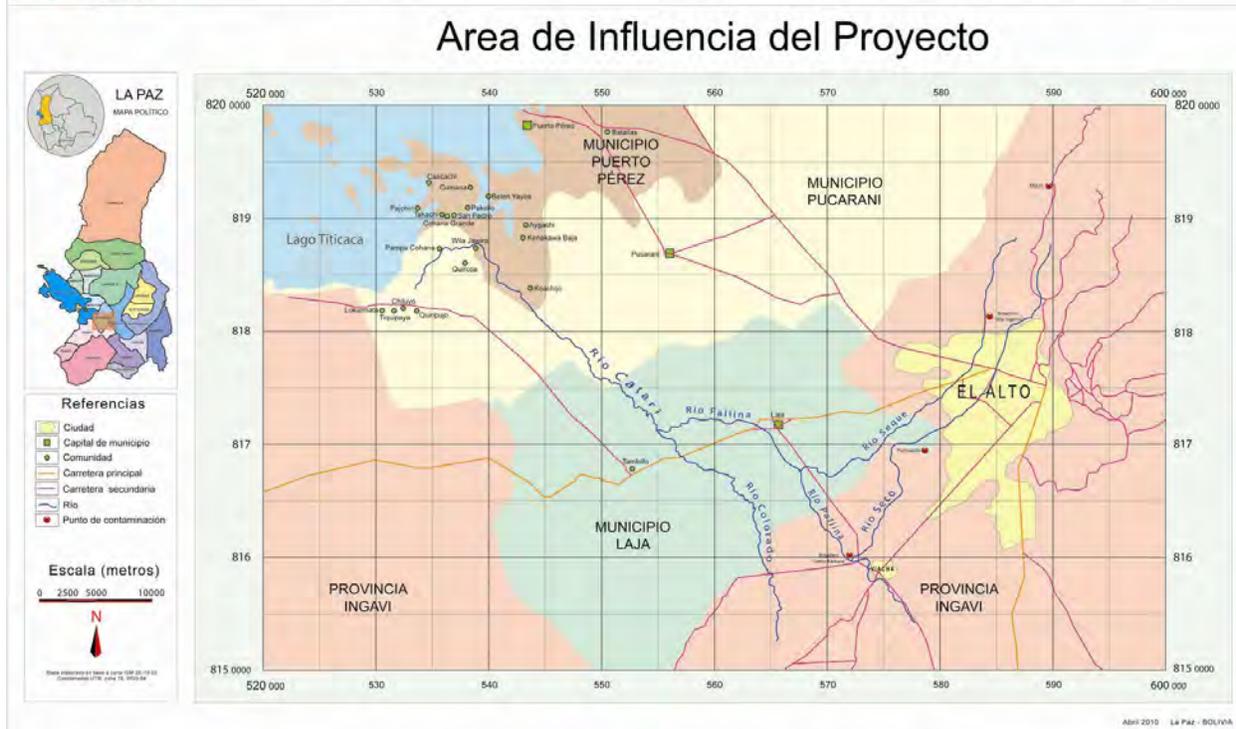


Figure 1. Map of Project Area.

3. Scope and Methodology:

The ProLago mid-term evaluation team, consisting of Bruce Bayle (USAID/US Forest Service) and Bronwyn Llewellyn (USAID) worked with-in Bolivia a total of two weeks (October 17– 28) to conduct interviews, visit field sites, review documents, and prepare a presentation of initial findings and a draft report for USAID/Bolivia Mission leadership, as detailed in the Scope of Work(SOW). Based on the scope of the questions posed in the SOW, as well as the existing monitoring documents from the project, the team decided to use a qualitative assessment through participant interviews rather than a qualitative evaluation. Reference [Annex A](#) for evaluation Scope of Work.

Reference [Annex B](#) for Work-Plan developed to elaborate Scope of Work implementation. Reference [Annex C](#) for a two-page memo prepared for the exit debriefing on October 28, 2011 with Mission personnel interested in the Program.

The team commenced by creating a list of interview questions (in Spanish) to guide interviews with both project staff and external partners. The list of questions was based on those posted in the SOW, however were consolidated and rewritten to increase ease of response during interviews. Reference [Annex D](#) for final listing of interview questions posed to all interviewees; Spanish and English.

The team conducted interviews of project staff in La Paz, USAID staff, partners – including municipal authorities and other donors – as well as IRG field staff and beneficiaries both in El

Alto (Component 1) and around Cohana Bay (Component 2). Reference [Annex E](#) for listing of all personnel interviewed.

Once the interviews were completed, the team consolidated interview responses and reviewed additional literature. They then prepared a draft evaluation document for review by mission staff, as well as a presentation to Mission management of initial findings.

This report was prepared by the team after their return to Washington, incorporating the comments of mission staff.

Timetable:

Date	Location	Purposes
17 Oct.	La Paz	Met with Project Staff at IRG offices and USAID Mission, developed consolidated interview questions.
18 Oct.	La Paz	Interviews with IRG and subsidiaries: <i>Ecología y Empresas</i> (EyE), Manoff Group, and CPTS
19 Oct.	Field	Field visit to interview Mayor of Viacha, afternoon visits to CPTS partner enterprises in El Alto including meat and leather factories.
20 Oct.	Field	Interviews with Pucarani Municipality officials, field visit to Cohana Bay beneficiaries, and project field staff.
21 Oct.	La Paz	Final project staff interviews at IRG.
24 Oct.	La Paz	Draft report preparation; interview of USAID COTR.
25 Oct.	Field	Field visit to Chojasivi community beneficiaries and interview with project field staff.
26 Oct.	La Paz	Draft report preparation, interview of GIZ partner staff
27 Oct.	La Paz	Draft report preparation
28 Oct.	La Paz	Presentation of draft evaluation/findings to USAID/Bolivia mission leadership and staff.

4. Analysis and Findings:

This section combines both the “analysis” and “findings” sections. Per USAID guidance, an “analysis narrative” addresses primarily quantitative outputs of an evaluation; the evaluation of ProLago did not lend itself readily to a quantitative analysis. This section centers on responses to the 11 key interview questions posed to Mission staff, contract personnel/partners, beneficiaries, and others.

Interview Question 1 of 11: Are the logical framework, specific objectives, and desired results (7) adequate, real, and achievable within the timeframe of the Program?

Logical framework comprehensive, developed at the beginning of the project, the USAID common indicators were received one year after Program implementation; although should have been provided earlier. Program activities fit within the current Sustainable Economic Growth and Environment Results Framework for USAID/Bolivia Mission. Program centered on biodiversity conservation/improved water quality; three Specific Objectives: (1) Component 1 – reduce pollution from Industries and urban areas; (2) Component 2 – reduce pollution from rural sources and improve natural resource management in rural areas; and (3) Component 3 – empower local actors.

Overall Program objective: “Contribute to the environmental health and quality, reducing the

risks and threats to the people and biodiversity of the El Alto – Lago Titicaca watershed” is a laudable, although not fully achievable by a project of this size, over the five year time period of the Program. However, the Specific Objectives covered by the three components create a framework that will remain past the life of the program and continue to contribute to the solution of water quality issues within Cohana Bay.

Component 1:

- Realistic objective, but not fully achievable during the Program’s life. Roundtable with Government of Bolivia (GOB) partners not possible due to political realities. Clean Development Mechanism (CDM; MDL in Spanish) project planned for the El Alto wastewater treatment plant (Puchokollo) not achievable due to GOB policy against carbon sales.
- In assessing which industries/sectors component of the Program should work in, Program leadership decided for political reasons not to work with the many sources of hydrocarbon pollution emanating from El Alto. A primary rationale being that coca base production utilizes much hydrocarbon compounds.
- Indicators 1.1.2, 1.1.3, and 1.1.4 capture water quality monitoring data; emphasis on “dissolved oxygen” and “biological oxygen demand” as key water quality parameters. Doubtful of the full realization of indicators 1.1.3 and 1.1.4 within the time frame of the Program. Recommend “lowering the bar” on indicator accomplishment; change to more realistic/achievable targets. Indicator 1.2.1 states 10 industrial “point sources” being monitored; Program only working with 8 El Alto industries, recommend indicator be changed.

Component 2: Objective is realistic and achievable; indicators are on track, or have already exceeded expected results. Humus production has become an important economic growth activity amongst lower watershed beneficiaries; to expand humus sales, and make production/sale sustainable, Program making national contacts to promote sales.

Component 3: Objective is realistic and achievable, but has been hindered by poor relations between the GOB and USG, leading to a directive to keep a low profile by USAID/Bolivia. High turnover rate in municipal personnel has also hampered success. Program has eight standard USAID indicators and 31 custom indicators; for management reasons, too many custom indicators to reasonably manage. 20 would be a more appropriate number. Program has requested changes to indicator accomplishment due to its inability to work in the area of climate change/carbon credits due to GOB stance against the sale of carbon credits; evaluation team considers this a reasonable request. Indicators are on track to reach expected results.

Program management very conscientious/commended for repeatedly stating the primary goal of Program is improving water quality in CohanaBay. First dry season and first rainy season water quality monitoring served as baseline for establishing indicator results. Program designed to use available GOB water quality monitoring data as a baseline, but inadequate quality and quantity of GOB data to utilize; hence the Program began with establishing its baseline of water quality within the streams that feed into CohanaBay.

Interview Question 2 of 11: Program indicators do a good job of measuring program outputs; do they do a good job of measuring the impact of activities?

Program implementation at the time of the evaluation has changed from conditions present at the inception of ProLago; sampling of conditions/implementation at the start of the Program:

- Much participatory dialogue with rural community residents to prioritize their issues; water contamination was initially a lower priority of community members.
- Little confidence amongst local residents at Program inception that Program would produce any direct/concrete benefits for residents. Program worked hard early on to achieve acceptance by rural communities. Much history of previous rural development/water quality programs working within the same geographic scope as Program; many of those programs did not deliver on promises made to community members. ProLago overcame a certain level of resistance to a new water contamination focused program.
- Initially, local community members did not realize size/scope of water quality issues within their communities; now well informed.
- Field offices were opened in Cohana and Cojasivi communities, this provided ProLago with credibility that they were there to employ solutions to water quality problems and allow for measureable impact.
- Closure of old dump along the Rio Pallina in Viacha in a timely manner allowed the Program an early success and to be taken seriously by the Municipality of Viacha.
- Communications Unit has produced good didactic material describing solid waste and water quality issues impacting Cohana Bay; Program has emphasized that solving those issues begins with individual community members, versus the perception that finding solutions to the problems rests with municipal governments.
- Construction/use of vermicompost (worm rearing beds) has proven to be an activity with a high level of local acceptance due to the significant economic impacts related to the sale of humus produced by the wriggler worms (variety adapted to high elevations).

Centro de Promoción de Tecnologías Sostenibles(CPTS)/Component 1:

Focus on reducing production costs and reducing water pollution for El Alto industries a sound strategy. Water quality monitoring data to date make it difficult to assess overall water quality impact (on Cohana Bay) of CPTS cleaner production technologies for the eight industries that CPTS is working with at this time; on-going water quality monitoring to quantify the degree of impact. Recommend Program develop a comprehensive/integrated plan to share industrial-scale cleaner production technologies with smaller-scale industries within El Alto; both licit and illicit (clandestine) small-scale industries.

Chromium is an element widely used within the leather tannery sector to ensure leather has a supple feel. Preliminary chromium (Cr)/water monitoring data downstream of Bonanza Industries (largest tannery in El Alto; primary Program partner) demonstrates Cr precipitates out of the water column relatively rapidly (precipitated/bound with sediments) and not moving downstream towards Bahia Cohana/Lake Titicaca. Although evaluation team believes downstream movement of Cr very probable during storm events. Public release of Program's water quality data considered sensitive since monitoring data could be interpreted in various manners. Questions to be addressed prior to wide-spread distribution of end-of-Program water quality monitoring results:

- How should Cr data be treated in the final water quality monitoring report?
- Should final report be peer reviewed?
- Role of storm/high water events moving Cr downstream over time?
- What is the sediment load of heavy metals in the lake, and what is the uptake rate by lake plants/animals?

Component 3 – Communications:

Communication focus has been oriented towards working with schools rather than the mass media to achieve greater impact. Via communications, Program has created a demand for rural

water quality improvement activities for which local government entities cannot satisfy. Program works to not raise expectations of rural residents that Program activities cannot satisfy. Not enough communication material available in Aymara, reduces the level of impact possible.

During a planned November 2011 internal planning meeting, plan to increase FY2012 funding available for Component 3 to undertake the important job of pushing CPTS “cleaner production technologies” down to smaller industries within the four sectors of interest. Media campaign to spread downward, within El Alto, to smaller scale industries proven clean production technologies to occur over final two years of Program.

Program works to demonstrate impacts through quarterly progress reports and one-page fact sheets. Program successfully planted the seed of stable construction/use within the Cochabamba region, now widely copied by others, including the GOB. Program URL – Bolivian culture doesn’t encourage much utilization of the web as a communication resource; of minimal value/impact in rural areas.

Study tours of beneficiaries to other highland locations in Bolivia considered effective. Time necessary to determine the true impact of Program field activities; can’t be fully determined within the time frame of the Program. Field activities to date have been very favorably received by the municipal government and local, rural residents.

Interview Question 3 of 11: Is ProLago utilizing adaptive management in its execution? Give examples.

From the start the Program has had to adapt quickly and fluidly to changing political conditions outside their control. For example, the American Ambassador was expelled from Bolivia one week into the start of the project, forcing the program management to take a very different approach towards interacting with the GOB than was initially planned. US relationships with the GOB continue to be a challenge to the Program, requiring great flexibility in the timing of activities, and the roll-out of certain projects. The GOB has been against aspects of international efforts to combat Global Climate Change programming, including the sale of carbon credits on international markets, which left money available that had been tied to the Puchokollo wastewater treatment plant. On the upside, not having a GOB ministry as a partner meant that ProLago was able to implement on-the-ground activities in a faster manner. Program was successful in reprogramming unused funds from the Puchokollo methane capture activity to fund a Climate Change Adaptation Assessment (accomplished by Bruce Kernan, Ecuadorian contractor) being undertaken at this time.

IRG initially signed an agreement with Food for the Hungry (FH) for a cooperative relationship, but FH backed out at the last minute, IRG to cover Component 2. Switching partners did not change the focus of the project, because the personnel FH fired was immediately hired by IRG; so in the end, these actions are perceived as a benefit.

Program has been flexible regarding use of stables every night during the year; many residents maintain pastures near their homes where use of stables is routine; however many have seasonal pastures some distance from their homes making the use of stables impractical. This has led to the development of a new stable design and a new emphasis on forage production, management, and storage, to enable beneficiaries to maintain their cows near home year-round.

Hothouses for vermicomposting (worm farming) were initially designed to have one bed for worms and another bed for growing vegetables for home consumption and additional income. This was important because the growing plants help maintain the high levels of humidity necessary for the worms and for protecting the expensive "Agri-film" plastic roofs (last longer in higher humidity). However, the production of humus was of such great value to farmers, most utilize both beds for vermiculture, necessitating new ideas for maintaining humidity within the hothouse; farmers have responded by placing used PET containers full of water within greenhouses. Farmers are being innovative to develop improved methodologies/practices for manure composting.

Initially it was expected that biodigestors would be installed in schools, both to provide cooking fuel and to better spread the techniques to families outside the Program. However, with annual changes in school leadership, and the lack of teachers on weekends, there wasn't enough interest or capacity to maintain them. Program made the sound decision to not continue with school-based biodigesters. Program technical specialists use a "learning through doing" methodology with beneficiaries.

Within original water quality monitoring program, there were no water quality monitoring points within Lake Titicaca (Cohana Bay); beginning with the third round of water quality monitoring, lake sampling points (three) added. Water quality monitoring done twice per year at 33 sites; including two reference streams out of the Cohana Bay watershed (commendation). Additionally, a subset of monitoring points added below the Bonanza tannery to better understand Cr movement/deposition within an El Alto stream. Cr was not initially within the scope of indicators for water quality, but it is an important (from a public health standpoint) element to monitor; for that reason a special sub-set of monitoring points were added. New/revised water quality custom indicator to be added to the Program's "performance monitoring plan" (PMP) to track heavy metals (especially Cr); presence or absence of heavy metals to be done via routine water quality monitoring.

Initially, the Program hoped to work with the same water quality laboratories as GOB ministries, but they turned out to not have the appropriate capacity. Program is now working with three separate laboratories in order to perform all needed tests, as no one lab is capable. To date, water quality monitoring results not showing significant changes in Cohana Bay as a result of Program interventions.

Internal ProLago review during February 2011 highlighted some areas needing correction in the EyE administered field technical assistance and administrative procedures; EyE at the time of this evaluation was still trying to correct to improve the EyE implementation of Component One, EyE Executive director (Carlos Meave) is contemplating a change of personnel (Juan Carlos Enriques); EyE leadership currently within a consolidation process.

ProLago technical assistance team routinely interacting with new municipal and "*dirigentes*" leaders; issue of constant re-training of Program concepts with new personnel. Each new elected official has their own environmental/water quality foci, not necessarily those of ProLago; Program field technicians work to educate elected officials to objectives/achievements to date of the Program. Societal dynamic affecting Program implementation - on a routine basis, beneficiaries decide to leave the "campo" for opportunities in urban areas and out of Bolivia; smaller number of young people returning to the lower watershed countryside to pursue cattle management. Program has been flexible to adapt to the changing social landscape.

Program diligent in monitoring how field activities contributing to results; if something not functioning well, Program uses adaptive management to change activities to contribute to results. PMP is expected to be modified to address changed conditions. To strengthen municipal ties with Pucarani, Program assisted mayor to obtain a US visa to attend a Latin America mayoral conference in Miami, FL; although not directly related to Program objectives, the relatively small task strengthened relations. Program has addressed the reality that environmental/water contamination issues are not high priority issues for rural municipal governments. This reality reflected in funding for municipal “environmental units”.

Interview Question 4 of 11: From a social-economic viewpoint, how is the Program contributing to improved incomes for rural families working with the Program?

Humus production (vermicompost from cow manure) considered a very good source of income for rural beneficiaries. For example: 90 Bolivianos per 100 lb. bag x 600 lbs. production = 540 Bolivianos (approximately \$80 USD). Most beneficiaries can obtain between 6 and 20 bags (dependent on the size of the vermicompost beds) of humus every three months. This represents a significant increase in income for farmers. Program actively working to ensure future markets for humus; in contact with USAID’s ARCO Program and with quinoa producers in the Oruro region. Examples of value of humus production activity to beneficiaries:

- Chojasivi community beneficiary has doubled the size of his vermicompost beds to duplicate availability of humus for sale.
- Rural beneficiaries have adapted the Program design of one vermicompost bed and one vegetable bed per facility to 100% vermicompost production; although that model being abandoned in favor of two vermicompost beds per greenhouse.
- Several beneficiaries admitted to plans to move their families to La Paz, but made the decision to stay within the community based on the income generated by humus sales.
- Quiripuito community has formed a cooperative, developed their own marketing tools (including hand colored sacks), and has a contract for 150 bags of humus, produced as a collective. They also sell their Humus in La Paz for use in urban/suburban gardens.

Biodigester use has resulted in many families going from two propane bottles per month to one. Use has also resulted in less use of dried dung as a cooking fuel- improving human health and air quality. Biol (liquid/foliar crop nutrient) is used for fertilizing nearby crop fields (potato, quinoa, etc.), increasing fodder production (primarily alfalfa), and allowing farmers to keep their cows close to their homes; thus increasing stable utilization. Women beneficiaries appreciate having methane gas on-demand for when propane cylinders become depleted; GOB limits propane availability in Cohana Bay communities due to proximity to nearby black-markets for propane in Peru.

Stable acceptance and use has increased markedly over earlier years of the Program; beneficiaries readily see two primary benefits of stables: (1) cows kept overnight in stables (warmer conditions) increase their milk production by at least one liter over nights when they are kept outside; and (2) by concentrating manure production, less work is involved to transport manure to vermicomposters or biodigesters. Increased milk production has allowed some families (Chojasivi) to economically switch from cheese making to selling raw milk to dairies in El Alto (milk collected locally by El Alto dairies).

Program interventions in the lower watershed have given young families improved economic prospects, they are not immigrating out of the region as frequently as before start of the Program.

Within the town of Viacha, the new municipal solid waste landfill has given the opportunity for several new recycling micro-enterprises to open to take advantage of improved municipal refuse collection.

Interview Question 5 of 11: Considering all ProLago activities, upper and lower watershed, which are capable of being sustainable over the medium- to long-term? Why?

Within the lower watershed of Cohana Bay, field activities are being implemented in an effective and sustainable manner; ensuring water quality improvement, biodiversity conservation, and improved economic livelihoods to individuals; below are noted several caveats to the sustainability of lower watershed activities.

Vermiculture - Certain communities, including Quiripuio, have formed cooperatives, have contracts with buyers, and are at the point of working completely on their own. Numerous beneficiaries interviewed are almost at the point of purchasing manure from their neighbors who are not in the program in order to meet humus demands. These cooperatives are expected to last well past the end of the project. Several beneficiaries have been able to scale-up their operations (both vermicomposting and stables) with their earnings from the ProLago supported activities. Early Program results have allowed more rural farmers to participate in the Program; often times rural farmers need to “see to believe” before undertaking new activities.

Stables - Some stables are not in use during the dry season because there is no forage nearby, but those farmers are very interested in testing new fodder growing techniques, including using Biol to improve alfalfa growth, and creating silage for cattle feed during the dry season. New stable designs include feeding and watering areas outside of the barn. Farmers who use the stables have seen a considerable increase in the milk production from their productive cows, increasing the use of the stables. Stable roof water collection systems viewed as very sustainable; relatively low costs for a long-term storage of rain water.

Animal Health - Veterinary promoters who have received animal health training from a veterinarian (part of Program staff) are available much more readily to their communities than municipal veterinarians, and are unlikely to leave, as they receive wages for their time spent providing animal health services to community members. Activity started out as 50/50 funding (Program/beneficiaries), but is now fully funded by beneficiaries. Improvement of genetic quality of cows, via artificial insemination, viewed as a key, sustainable ProLago activity; an activity the veterinary promoters trained in. There is doubt as to the realistic expectation that farmers will be willing to reduce their overall number of cattle by replacing large numbers of low or non-producing cattle with fewer high-producing cattle; cattle numbers/ownership seen as a sign of wealth.

Biodigesters may have more limited sustainability; they provide a reliable source of methane gas for cooking; although propane gas is heavily subsidized by the GOB and readily available in rural communities. Subsidized bottled propane gas doesn't facilitate the urgent need for gas produced from biodigesters. Biodigesters require a relatively large input of water (which can be difficult during the dry season and in certain communities); replacement of the large black plastic biodigester envelope may be relatively expensive and difficult to find when replacement necessary. The black plastic biodigester envelopes predicted to last approximately five years. That being said, many people are still very interested in having them – women in particular prefer to cook with biogas, and take most responsibility for caring for them. For households without ready access to water, water inputs for the biodigesters can be an issue; Program

funded new well digging will greatly ease the water issue for many households. Regarding the replacement of biodigester materials in the future (black plastic envelopes and yellow [UV resistant] colored polyethylene roofs); if communities form cooperatives, it may be possible to bulk-buy the necessary materials, but this remains to be seen. The GIZ (German Technical Cooperation in Bolivia) biodigester project, which ProLago bought into, is nation-wide, and has sustainability as a primary goal. GIZ is encouraging more companies to make the plastic, and entrepreneurs to set up biodigester supply businesses, so that the materials will be available past the end of both GIZ and ProLago programs.

Water Wells - Project provided well digging equipment which is now managed and shared by communities; low technology equipment provided should be serviceable for numerous years. Activity considered sustainable due to high demand and low costs associated with boring the potable water wells. Rural residents eager for new potable sources of water for domestic consumption, cattle, and vermicompost production; numerous residents do not have easy access to potable water.

ProLago has facilitated the sustainability of these activities by requiring significant input by the beneficiaries. This has the following benefits:

- Self-selection of interested individuals.
- Materials are locally sourced and reasonably priced (including polyethylene bags for storing methane, black netting for removing worms from compost, as well as vaccines and other animal medicines).
- A strong sense of investment/ownership on the part of the beneficiaries.

Within the upper watershed focus area, there is more uncertainty on the sustainability of the industrial scale projects in El Alto. Pilot projects with the four industrial sectors are definitely working towards sustainability. Most CPTS cleaner production technologies involve cost savings to industries, a “carrot” leading to sustainability. Generally speaking, if industries see real savings in expenditures by reducing/reusing chemicals released with wastewater, or can make money as an additional business through the large-scale production of humus, then the projects will be sustainable. Communication strategies will be key to promote buy-in for these projects in other mid- and smaller-scale companies.

Municipal programs(primarily solid waste and waste water management) are also uncertain, particularly with the rapid change in governance, and the need for higher levels of program assistance. However, municipal solid waste management, such as in Viacha, may be sustainable where costs can be billed to local residents by inclusion of solid waste costs on electrical bills.

From a sustainability standpoint, communications activities are not sustainable beyond the life of the program. Program evaluation of the effectiveness of mass media communications campaigns showed such campaigns to be of limited value. Water quality monitoring system is not sustainable over the long-term due to lack of GOB buy-in.

Factors contributing to sustainability:

- Regular rural technical assistance has many benefits, including maintenance of people’s spirits regarding Program activities. Training and technical assistance work to provide opportunities to hold young people on the land.

- Some beneficiaries considering a cooperative/rotating fund to purchase veterinary supplies (vitamins, de-parasitizing, etc.) that would be administered by Program trained veterinary technicians.
- Very good acceptance of lower watershed field activities by beneficiaries.
- Veterinary promoters viewed by Municipality of Pucarani as very positive; need to better integrate promoters with municipal environmental unit.
- Within the lower watershed, “pilot phase” now complete; entering a “consolidation” phase; maintain activities initiated with community residents to improve water quality. Economic gains by beneficiaries demonstrate sustainability of activities.

Interview Question 6 of 11: How effective has the Program been in achieving coordination amongst partners? Is the Program working with the most effective partners; are there others the Program should be working with? In terms of both internal and external partners.

IRG – USAID contract signed one week prior to the US ambassador being requested to leave Bolivia; an ill way to begin a program that had good USAID – Bolivia relations as a focal point. A desirable initial goal of the Program was to form a roundtable with GOB ministries involved in water quality/biodiversity conservation; poor USAID/GOB relations did not allow for that well conceived activity.

At this time, IRG has good relations with *Centro de Promoción de Tecnologías Sostenibles* (CPTS); although still some unresolved, outstanding performance issues. CPTS collaborating with the *Empresa Pública Social Del Agua y Saneamiento S.A.* (EPSAS - Public Social Water and Sanitation Company) to ensure harmful water discharges are lessened. In the case of Bonanza, which does not secure water for its tannery processes from EPSAS, water authority does not have any legal authority to monitor/enforce EPSAS regulations since Bonanza obtains its processing water from an on-site well. CPTS needs to work with EPSAS to address this water quality compliance (from the standpoint of EPSAS) issue.

IRG strategic partners “*Ecología y Empresa*” (EyE) and CPTS worked together well initially; although CPTS lacked the technology and capacity to manage scaled-up cleaner production industrial processes. CPTS informed IRG they had in-hand best management practices (BMP) technology for the industrial sectors of concern (tanneries, meat processing, beverage, and dairy products), but in reality they had BMP technologies designed at the laboratory level, not for industrial-scale. Consequently, for the first year of implementation, CPTS worked to scale-up their BMP processes in lieu of actual implementation; a significant weakness. EyE focuses on solid waste management; from project inception, their implementation speed was designed to match that of CPTS, but CPTS’s slow start did not allow for the hoped for synergies between the two during year-one of implementation.

CPTS was a lead partner on previous USAID/Bolivia programs; it has been hard for CPTS to assume role of a “secondary partner”; this issue has been largely resolved. Professional IRG management – due to performance issues with CPTS, during FY2011 they withheld payments to CPTS until agreed upon deliverables met. IRG appears to have professional, relatively smoothly functioning relationships with sub-contractors at this time; not always the case.

A complicating management issue regards much personnel rotation at the municipal government level, making necessary repeated contacts with new partners and training of new people. Additionally, for political reasons, it is very difficult to establish Program relations with many municipalities within the Program’s watershed geographic scope. Program places much

attention to routine planning of work activities and accomplishment of indicators. Program's internal "consolidation workshop" viewed favorably to increase communication and status check of Program deliverables; a space to discuss outstanding/undefined issues with Program implementation.

GOB rural development program (PAR) working within the same geographic space of ProLago has copied ProLago's stable model and replicated it many times. A positive development. Due to changing relationships between USAID and the GOB, USAID often times requests the Program to keep a low media profile.

Sound PROLAGO - GIZ Partnership - GIZ working with ProLago in biodigester training/construction/operation. IRG has a very good relationship with GIZ in the area of biodigester construction. GIZ has publically acknowledged meaningful results achieved in collaboration with ProLago in biodigester construction.

Municipality of Pucarani (key region of work): Mayoral office well aware other nearby municipalities have been reluctant to work with ProLago for political reasons. Political concerns have been an issue in the past with Pucarani, but relatively new municipal administration is very pro ProLago. Municipality desirous of obtaining water quality monitoring data; for good reasons, Program does not want to share interim water quality data with municipalities since the raw data is not interpreted. To further gain support of the Pucarani Municipal government, ProLago now working on solid waste and waste water collection systems. Planning for solid waste solutions has been very participative, including very good collaboration with Swisscontact (Swiss Foundation for Technical Cooperation).

Mayor of Viacha appreciates ProLago's integrated upper and lower watershed approach to resolving water contamination issues. Municipal political concerns in the past have been an obstacle to local Program adoption by municipal government.

Numerous NGOs working on Lake Titicaca issues; Program has been willing to work with those that want to cooperate in a meaningful manner; does not engage of fostering an environment of competition amongst local NGOs. Prior to ProLago, the "*Autoridad del Lago de Titicaca*" [ALT] (bi-national authority) worked in the Cohana Bay watershed, but with little to no on-the-ground activities; ProLago saw no benefit to work directly with ALT. Program has a policy of productive engagement of all actors working within communities.

Following notes outline how the Program successfully addressed numerous implementation/start-up issues early on; thereby allowing for more efficient implementation:

- Unfortunately, began as a unilateral program, versus the intended model of bilateral.
- Program began September 2008, that same week the US ambassador was expelled; an auspicious start. Activities began February 2009.
- Some internal (ProLago team) resistance to the importance of the monitoring and evaluation (M&E) role; said resistance subsequently overcome.
- CPTS began Program much slower than anticipated, plus they were slow to sign cooperative agreements with El Alto industries (eight).
- Program had consulted with the Bolivian NGO Feed the Hungry (FH) to be a prime partner, but at the last minute FH opted not to become associated with ProLago. Subsequently, ProLago hired several of FH's key staff; good example of adaptive management.

ProLago attempted to cooperate with EPSAS, El Alto Mayoral office, *Prefectura* of La Paz, and GOB agencies involved in water quality monitoring to establish a common network of monitoring points within the CohanaBay watershed – a laudable goal. Participatory approach did not function due to poor US – GOB relations; ProLago pursued its own water quality monitoring program, utilizing monitoring points common to other GOB agencies wherever possible. Some municipalities within the watershed fearful of associating with a USAID funded program due to much negative press at the national level of USAID; fearful of a backlash from the national or prefecture governments. To be a total of eight water quality samples across the network of sampling points during the duration of the Program. Results after five years of water quality monitoring (two samples per year) to allow for a comprehensive water quality overview and tracking of indicators. Program’s water quality monitoring program initially designed to be a robust multi-site/multi-time frame initiative, but the Ministry of Environment withdrew early-on from the initiative. Hence a less robust (only two samples per site per year) program put in place; a less rigorous monitoring schedule does not allow the Program to detect monthly/quarterly fluctuations of water quality.

Program communication collaboration with the Ministry of Education has been problematic, mixed messages delivered; in lieu of working with GOB ministries, Program has focused on working with willing municipalities. Coordination with municipalities could be more effective if there was a consortium of municipalities working with the Program; not a political reality at this time. Program desired to work with many municipalities within the Cohana Bay watershed, but most municipalities are MAS affiliated (presidential party); collaborative relations not possible for many municipalities, most notably with El Alto.

Program has been unable to work within the area of Clean Development Mechanisms (MDL in Spanish) with El Alto utilities (waste water and solid waste landfill) because the GOB has a stance against the sale of carbon credits within the country. Unfortunate since the Program had developed several promising MDL initiatives (most notable - methane capture at the Puchokollo [El Alto] wastewater treatment plant) that could have resulted in significant additional financing to operate municipal solid and waste-water facilities. Program initially established a cooperative agreement with the Bolivian Cement Society to cost-share program work, but before the agreement became operational, several cement companies were nationalized and the agreement became null and void.

Strategic partnership with USAID’s “*Proyecto de Productividad y Competitividad – Bolivia*” to secure markets for humus commended. A 50/50 cost share executed for the collaborative initiative involving “business plan” development. Successful Program strategy – work with partners (at local and municipal levels) predisposed to work with a USAID program. Community-level beneficiaries and “*dirigentes*” have opened doors to successful collaboration with select municipal governments. At the same time, lower level partners are cautious regarding working with a USAID program.

Interview Question 7 of 11: How effective has been the acceptance of Program best management practices/cleaner production technologies within each sector; by beneficiaries?

Early-on in the Program, CPTS was not able to begin industrial-scale clean production technologies with industrial demonstrations (within four sectors) because the technologies they informed IRG that they possessed were not ready for industrial-scale application in year one. In reality, what CPTS possessed were laboratory-scale processes that were not ready for scaling-up in year one of implementation; hence, delaying pilot demonstration activities by one year.

CPTS's process to expand cleaner production technology information to small and medium-sized businesses within each of the four sectors in El Alto is not a clear strategy.

Program has presented numerous workshops within the Municipality of Viacha to sensitize residents to the problems/solutions to solid waste management; approximately 10 smaller communities remain to receive the workshops. Pucarani Municipality not now receiving quarterly progress reports; desirable to share contents of quarterly reports, in Spanish, with municipalities.

Evaluators informed that prior to the initiation of the Program, many NGOs/organizations had done numerous studies of the issue of water quality, but ProLago put their words into actions; they quickly began field activities to win the acceptance of local residents.

Biodigestors:

- Much beneficiary pride in them – beneficiaries installed biodigestors in communities with their own labor, shared 25% of the costs of biodigestors with IRG and 25% with GIZ.
- Beneficiaries have seen their reliance on bottled gas for cooking halved; resulting in an average saving of the purchase price of one bottle of propane gas per month.
- Beneficiaries don't have a market for "Bio" (liquid fertilizer resulting from anaerobic process) yet, but are experimenting in their own fields at this time – to be truly effective, they need backpack sprayers, but that is an additional cost that not all are able to undertake. Program has contracted with a university researcher to determine elemental fertilizer properties of "Bio".
- Beneficiaries able to fix biodigestors on their own when plastic pipes leak or in-house gas reservoirs become torn.

Vermiculture ("*Lombricarios*" in Spanish):

- A group of beneficiaries have recently signed a contract with a buyer in the Yungas region, promising 150 50-kg. bags of humus at 90 Bolivianos per bag; community can produce this quantity approximately every 3 months.
- Beneficiaries obtaining significant quantities of humus (+/- six 50 kg. bags) out of each bed, most have doubled their production by giving up growing vegetables. One person who grew lettuces in a "*lombricario*" bed took them to el Alto and didn't even make enough money for her return trip.
- Labor varies by participant, from needing to water twice per day (for vegetables), to watering every other day for vermicompost. Different people use different substrates to cover worm rearing beds.
- Beneficiaries are very confident in their ability to continue this activity without ProLago participation.

Animal health:

- Program veterinary taught beneficiaries a full suite of animal (focus on milk cows) health and welfare techniques; including artificial insemination.
- Additionally, veterinary taught beneficiaries where to purchase cattle medicine/supplies; more effective than just informing them which medicines/vitamins to utilize.
- Artificial insemination for improvement of cattle has been met with a lot of suspicion (so far relatively few have used it) to date. Doubts due to previous projects where calves produced could not handle the altitude conditions. Also a concern that the local cows are too little physically to handle larger/improved varieties of calves, resulting in calf death during birthing. The relatively few that have used artificial insemination to date are proud of their

healthy calves. Other farmers have come to see young calves; a positive methodology to allay doubts regarding artificial insemination.

- A beneficiary commented that the improved cows have to be kept in stables at night, cannot be left out in the “Altiplano” cold; Program stables a key resource.

In general, Program has very good relations with beneficiaries; staff visit all field sites at least once a week; Program promoters regularly available for consultations. One complaint heard is that only the veterinary promoters receive the capacity building, the rest of the community learns from them. Although, evaluators learned that large segments of beneficiaries, men and women, receive regular training on a variety of biodiversity, water quality, and manure management themes.

Interview Question 8 of 11: Have you seen changes in attitudes of Program beneficiaries? Describe.

Due to Program activities/trainings, attitudes towards water contamination have changed appreciably for residents near Cohana Bay; they are now well aware they are both the cause of water contamination (primarily their cows), but also part of the solution. A beneficiary stated they used to actively put piles of manure in the stream beds to be washed away, but now they do not, because that resource is worth so much money as humus – his goal is for there not to be a single cow paddy left on the ground.

Stabling cows at night requires a behavior change in the management of livestock; however, farmers very clearly see positive results in milk production and health of their productive cows, and appreciate the easy access to manure for biodigester and vermicompost activities. Even farmers who are forced to send their cows some distance away from their homes/stables due to a lack of fodder during the dry season had plans to improve fodder storage so they could keep their cows closer to home in the future.

Reducing herd size to maximize productive animals over non-productive ones is a major behavior change that is slow to catch on, but it seems to be gaining traction. One farmer described selling off his family’s entire herd and replacing it with fewer, higher-quality animals (primarily Holsteins).

Construction/use of biodigesters has proven to be an activity with a high level of local acceptance due to the significant energy savings produced by the biodigesters; supplements purchase of propane gas cylinders. Co-production of “bio” (organic, foliar fertilizer) is an emerging market as well. Program to collaborate with USAID/Bolivia’s *Programa Competitividad Bolivia* regarding marketing of humus.

Initial key issues of Cohana Bay watershed residents: (1) Titicaca Lake water quality and (2) cattle (for milk production) health/well being. Prior to ProLago within the Cohana Bay watershed, previous rural development programs provided much material support; a culture of the “hand extended” developed; ProLago worked to overcome that perception.

ProLago field/technical staff have seen significant improvement of attitudes of beneficiaries to Program activities; increased economic livelihoods seen as a real “plus” for rural residents. Municipal staff stated ProLago printed/didactic material of good quality, but via workshops and one-on-one conversations messages contained within the material must be explained to local residents. Within the Cohana Bay watershed, high level of awareness of environmental problems; ProLago focuses on providing solutions to known problems.

Purcarani mayor's office would like to see an expansion of ProLago activities within the municipality and more beneficiaries served.

Interview Question 9 of 11: What has the Program done to find solutions to barriers/bottle-necks to achieve positive changes in traditional practices of rural residents and El Alto businesses? Give examples.

The number one bottleneck faced by the Program is the attitude of the central government towards USAID. This has limited their partnership with many official bodies, and often caused unplanned periods where activities cannot proceed due to political sentiments at that time. Program has dealt with issue this by focusing more on a "bottom-up" approach, working with the farmers and industries directly, and allowing the proof of positive results to gain municipal approval/acceptance.

At inception of Program, local/rural residents did not understand nor desire to participate in the Program; positive field interventions changed initial perceptions. During initiation of ProLago, Program attempted to set itself apart from prior initiatives in the region by focusing on results, not solely on identification of problems. In spite of negative political environment nation-wide, Program well received at the field level at the Program inception.

Another significant bottle neck to the success of the Program has been the constant changes in the governing bodies in municipalities where ProLago operates. In several cases the project spent a considerable amount of time building up goodwill and champions in the "*alcaldia*", only to have to start from scratch again with a new administration. When evaluators spoke to the Viacha mayor (recently took office), he stated that he was pleased with the work USAID was doing, but was still taking a wait and see attitude to see if ProLago followed through with the entire planned program of work.

ProLago URL - <http://www.elalto-titicaca.org>/As of October 21, 2011 there were only 124 visits to the URL; how much emphasis should be placed on maintaining the URL current in view of the very few visitors? Recommend minimal time be spent by Program to maintain URL current in terms of publications/outreach in lieu of poor utilization.

Turn-over high within municipal governments; whereby Program personnel must re-engage/train new municipal personnel on a regular basis. CPTS frustrated by constant turn-over by personnel within cooperating GOB ministries. High turn-over is a factor negatively affecting the forward progress of various Program activities, especially within municipal workforces.

Solutions to barriers/bottle-necks to achieve positive changes in traditional practices of rural residents and El Alto businesses:

- Rural residents not initially enrolled in the biodigester activity became convinced of their utility at a later date, now there are few to no opportunities for additional biodigester construction; creating an unmet demand for biodigesters in Chojasivi region.
- Developing communication activities in the rural areas where the Program operates has been relatively straight forward, whereas development of communications material for El Alto residents has been more difficult.
- Program's cleaning of the Rio Pallina used a significant portion of the capacity of the municipality's new landfill; developed jointly with the Program.

- Reality of select industries CPTS works with – GOB political environment doesn't favor long-term capital investments to improve water quality due to potential for nationalization.
- Within the Chojasivi region, water is a limiting factor for new biodigester construction; Program working to assist in the digging of new water wells for individual families. Families provide labor utilizing Program purchased, low-tech drilling equipment.
- Program technical assistance specialists visit beneficiary farms on a weekly basis, often times beneficiaries not present on farms since they are selling locally-produced cheese within El Alto or La Paz; follow-up visits are made to re-connect with beneficiaries.

Interview Question 10 of 11: What measures are being implemented by the Program to ensure women and men are receiving benefits in an equal manner?

At the farmer/field level, Program has devoted much energy/resources to training residents in the areas of biodiversity conservation, water contamination, and practical solutions to water contamination of Bahia Cohana. Women hold a very important productive role at the farm level; ProLago does much one-on-one technical assistance with women at the farm level. Didactic material for women an issue since many cannot read/write; opportunity to create didactic material not involving words. During staging of rural training events, primarily men participate; often times men travel some distance via bicycle (not practical for women) to training events; although women implement many on-farm ProLago activities. When Program technical assistance specialists visit farms, much one-on-one interaction/training of women who implement/maintain most Program activities; especially biodigester management. Some training sessions in the Cohanacommunity region have had more participation of women than men; although usually men predominate.

Local women very interested in biodigester construction/management due to the direct benefits obtained via biogas. Program outreach to women critical since they are responsible for overall farm operation on a day-to-day basis. Much of men's time occupied by totora reed collection near lake to feed cows. Once vermicompost beds are constructed, women are more conscientious of their maintenance than men. Program has worked hard to incorporate women in rural water contamination reduction activities. Solid participation of women in rural trainings in the Chojasivi region.

Interview Question 11 of 11: Describe how the Program is complying with USAID's biodiversity indicators.

- a. Program has an express biodiversity objective?
- b. Program activities are based on a threats analysis to biodiversity?
- c. Is the Program monitoring for biodiversity indicators?
- d. Does the Program have as a purpose to change biodiversity in a positive manner within one or more biologically significant areas?

Prior to Program design, USAID/Bolivia requested USAID/EGAT personnel to undertake a "threats analysis", required when biodiversity funding is utilized. "Threats Analysis" delivered to USAID/Bolivia not shared with IRG during formulation of biodiversity indicators – break-down of communications. Biodiversity conservation is a direct, overall theme of ProLago, but for rural people within the CohanaBay watershed, biodiversity conservation was initially not a priority. Biodiversity monitored by two avian population counts (beginning and end of Program); fish populations with Bahia Cohana not monitored. Presence of certain fish directly linked to presence of some avian species. In addition to monitoring avian populations, it would have been desirable to have monitored fish populations within Cohana Bay. Zambullidor bird species (two – *Rollandiamicrptera* and *R. rolland*) are sensitive to presence/absence of small fish. An

apparent disconnect between Program's focus on discrete activities to improve water quality and avian monitoring; although Program technical assistance has repeatedly tied lower watershed manure management to water quality improvements in Cohana Bay as well as benefits to avian populations. Program Communications Unit has produced well done public outreach material making the link between Program activities and avian populations; several posters done depicting avian species present in and around Cohana Bay.

Management Actions:

In addition to the 11 survey questions listed above, issues arose that did not fit neatly into the questions posed. For relevant issues outside the scope of the 11 survey questions, this narrative created to address those issues.

- Lack of membranes beneath compost piles located at Tusequis Industries (slaughterhouse; El Alto) has been a delay in Program forward movement within the meat processing, dairy, and beverage industrial sectors. On a demonstration basis, dairy and beverage industry organic wastes are being processed via vermicompost at the Tusequis Industries processing plant. Vermicomposting of food/beverage industry wastes a sound strategy. Program awaiting CPTS deliverable of a completed Environmental Assessment (EA) addressing improved industrial waste processing. EA should have been initiated much earlier in the life of the Program.
- Program working to resolve outstanding financial and administrative issues between IRG and EyE.
- Overall impact of less nutrients from manure entering Lake Titicaca modest to date, impacts can be scaled-up over time, post ProLago. Program can be scaled-up by working in additional communities/municipalities.
- Program communications staff perceives as cumbersome USAID/Bolivia requirement that a USAID person must be present for communication events involving political figures, including rural mayors. This creates a barrier to the day-to-day meetings that could be convened to take advantage of short-term opportunities for collaboration.
- Outstanding management issue – no Bolivian water quality laboratories are ISO rated; not a significant issue, but can cause concerns regarding the reliability/replicability of lab results regarding water quality monitoring.

5. Conclusions:

Number one bottleneck/limitation faced by the Program is the attitude of the central government towards USAID. This has limited their potential partnership with many official bodies, and often caused unplanned periods where activities cannot proceed due to political sentiments at the time. Program has utilized adaptive management to a great extent to deal with a host of issues arising from poor relations between USAID/Bolivia and the GOB.

There exists doubt regarding CPTS' ability to broadly disseminate cleaner production methodologies developed within the four sectors of interest (tanneries, slaughterhouses, beverage, and milk products industries) to lower-level, small- to medium-scale industries within each sector of El Alto. Of particular concern are two sectors: tanneries and slaughterhouses. There exist many (exact number unknown) small- and medium-scale, often clandestine, tanneries and slaughterhouses that are not licensed nor pay taxes, and wish to remain "under the radar screen". Program needs to develop a concerted communications plan to effectively reach those industries.

Positive change of lower watershed beneficiaries' attitudes regarding the realization that they are both a cause of water quality problems (primarily nutrient loading from manure) and a part of the solution. Rural activities designed to promote collection of water contaminating manure and its conversion into useful products (methane, humus, and "biol") has been very successful; viewed as sustainable over the long-term. One aspect of the long-term maintenance of the biodigesters, replacement cost of the primary aerobic chamber (large diameter, heavy plastic tube), makes sustainability doubtful; doubtful due to the relatively high costs involved and limited availability of the large diameter chamber. Although GIZ working towards increased availability of large/primary biodigester envelopes. Development of rural veterinary technicians viewed as sustainable; technicians charge for their services, much demand for animal health assistance.

Behavior changes amongst lower watershed beneficiaries are not immediate nor uniform; working directly with the majority of the owners of the +/- 20,000 cattle within the lower watershed is not possible within the five year time horizon of the Program; nor is it possible to reach the majority of medium- to small-scale industries within the four industrial sectors of interest in El Alto. To date the Program has made significant, positive changes amongst a relatively small sub-set of the owners of the +/- 20,000 cattle and amongst the selected eight large-scale industries in El Alto.

Technical assistance messages (for both lower and upper watershed beneficiaries) for the most part have been effective to clearly articulate Program objectives and be clear on Program deliverables. Program has been effective in focusing messages on productivity and the immediate benefits that new practices create, and not on long-term messages; in keeping with desire to achieve Program objectives within the five year time frame. Activities focused on the benefits for participants, including municipal governments, industries, and individual farmers.

Program activities (lower and upper watershed) designed to be relatively easy to replicate and executed with local abilities in order to achieve wide-spread diffusion. Program design and implementation has placed emphasis on commitment of counterpart resources by the beneficiaries, ensures local buy-in/"ownership". Technical assistance in all areas (industry, producers' associations, independent producers) being implemented under appropriate environmental management and Cleaner Production criteria, enabling compliance with environmental standards and creating advantageous economic opportunities and greater productive efficiency.

In conclusion, solving water quality issues in CohanaBay and within El Alto is a longer-term proposition, ProLago's relatively small-scale program of providing many discrete field activities working to improve water quality and biodiversity is a significant step in the right direction. USAID needs better cooperation with the GOB, prefecture, other municipalities, and NGOs to address CohanaBay water quality in a comprehensive manner.

Reference [Annex F](#) for a one-page table that summarizes the expected sustainability of Program activities; both in the lower and upper watershed areas.

6. Commendations and Recommendations:

Narrative highlights Program commendations to date and recommendations for improvements to Program implementation during the final two years of Program, and recommendations for a "phase two" of the Program.

The following listing of “top” commendations (seven) and recommendations (nine) is derived from the lengthy listing of all commendations and recommendations located on pages 27 – 34; “top” commendations/recommendations are duplicated in more detail on pages 27 – 34. Even though many of the recommendations located on pages 27 – 34 are not considered “top tier”, they need to be addressed by Program personnel to improve delivery during the remainder of the Program.

Commendations:

1. ProLago development model effective – multiple, smaller-scale activities summing to a larger impact on water quality. “Do few things well” another way of describing field activities.
2. Partner *Centro de Promoción de Tecnologías Sostenibles* (CPTS) targeting work with industries across the four sectors of interest (tanneries, meat processing, beverage, and dairy) that are the largest polluters in terms of water quality.
3. CPTS methodology of working with pilot industries to demonstrate cleaner production technologies and the subsequent transfer to those technologies to smaller businesses in each sector of interest.
4. Program to undertake a study of Cohana Bay sediments to determine the presence or absence of heavy metals; El Alto tanneries a primary producer of heavy metals.
5. Municipality of Pucarani: (1) Now views ProLago as a strategic partner; not always the case. (2) Successful dialogue with Municipality opened the door for Swisscontact to begin direct interactions with the municipality in the area of payment system options for delivery of public services.
6. *Universidad Pública de El Alto* agreement to obtain thesis students to accomplish discrete investigations for PROLAGO.
7. PROLAGO agreement with GIZ that formed a strategic partnership for the construction of biodigesters.
8. Work with a local university (*Universidad Católica – Batallas*) to complete a study to assess human health associated with environmental health and in the area of child health.
9. Manure is becoming to be viewed as an economic resource by beneficiaries; primarily as raw material for vermicompost and to a lesser extent for biodigesters.
10. Program methodology for animal (cow) health whereby early in the Program there was a 50/50 cost share with farmers and over time farmers bear all the costs.

Recommendations:

1. Plan for a “phase two” of the Program. Phase II would work in two primary areas: (1) new municipalities to implement water contamination reduction activities (use of cattle manure) and (2) focus on mid- to small-scale El Alto industries to implement proven cleaner production technologies, within exiting four sectors.
2. Within the El Alto industry sector, recommend Program develop a competition to encourage small- and medium-scale industries to adopt proven cleaner production technologies.
3. Obtain buy-in from four El Alto industrial sectors to disseminate cleaner production technologies downward to small- and medium-scale actors within each sector.
4. Analyze the El Alto cleaner production situation to determine if CPTS has an adequate campaign for the widespread promotion of clean production technologies amongst small- and medium-scale businesses within the four industrial sectors of interest.
5. CPTS needs to improve coordination with Program’s communications team to develop a realistic plan to widely distribute cleaner production technologies material amongst small- and medium-scale businesses within each industrial sector.

6. "Data Quality Assessment" (DQA) not done for Program to date; USAID/Bolivia needs to schedule a DQA as soon as possible.
7. Funding constrained for Component 3; analyze existing budget to determine if it is adequate to meet forthcoming need to widely distribute El Alto cleaner production technologies.
8. Integrate Global Climate Change (GCC) "Adaptation" concepts into Program, including one or more standard GCC indicators. GCC Adaptation funding not necessary to incorporate adaptation strategies within a Program; opportunity for Mission to account for "indirect" GCC/Adaptation funding.
9. Integrate Global Climate Change (GCC) "Clean Energy" concepts to take advantage of "indirect" Clean Energy funding opportunity (Mission receives no "direct" GCC/Clean Energy funding) due to methane production/use from installed biodigesters.
10. Within the El Alto industry sector, develop a competition to encourage small-scale industries to adopt proven cleaner production technologies.

Interview Question 1 of 11: Are the logical framework, specific objectives, and desired results (7) adequate, real, and achievable within the timeframe of the Program?

Commendations:

- Program has been very clear in its water contamination message and its accomplishment of discrete field activities with municipalities and rural residents; focus on finding solutions to water quality problems.
- Elimination of the climate change/MDL indicator commended in light of GOB's refusal to allow for the sale of carbon credits to international, voluntary markets.
- Program focus on the four largest water polluting sectors (tanneries, meat slaughter/processing, beverage, and milk products) in EL Alto to address water contamination issues. Decision to work with the two largest companies per sector sound.
- Participatory approach used to develop custom indicators for Program.

Interview Question 2 of 11: Program indicators do a good job of measuring program outputs; do they do a good job of measuring the impact of activities?

Commendations:

- All "Latino" ProLago team; sole non-Bolivian is Chief of Party Carlos Rivas, a native of Honduras; allows for greater local acceptance/impact.
- Program emphasis on rural beneficiaries cost-sharing activities and sourcing materials locally are sound methodologies.
- To better understand the health of residents living near Cohana Bay, Program cooperated with the *Universidad Catolica (UAC – Batallas)* to complete a study to assess human health associated with environmental health. Presence of amoebas and giardia in Lake Titicaca determined. Copy of report given to Ministry of Health.
- Though not a direct impact to water quality, Program commended for collaboration with the *Universidad Católica* in the area of de-parasitizing children of Program beneficiaries.
- Rural radio programming, in Aymara, considered an important, effective learning tool.
- Weekly Program training courses for beneficiaries in the Chojasivicomunity; trainings usually start at 7 PM; an inconvenience to Program technicians, but a convenience to beneficiaries. Women routine participants in evening training courses. Regular/repeated visits by Program technicians to beneficiaries houses to ensure training lessons are "brought home".

- ProLago development model effective – multiple, smaller-scale activities summing to a larger impact on water quality. “Do few things well” another way of describing field activities. Development of comic books for rural schools in the area of solid waste management and its impact to water quality considered effective.
- Repeated message that ProLago is not a poverty alleviation program, but rather a water contamination program that directly benefits biodiversity conservation; as measured by the presence/absence of avian species within the watershed.
- Field technicians conduct regular (once or twice per week) visits to all Program beneficiaries. Regular contact key to ensuring field activities operated correctly and to answer questions/concerns of beneficiaries.
- 36 families per veterinary promoter; an adequate number to ensure demand for promoter for fee services.
- Inclusion of influential “*dirigentes*” (local leaders) as beneficiaries has multiple benefits; a primary benefit is that they serve as effective conduits to spread the word of Program opportunities/successes.
- Study done in FY2011 to determine which rural radio stations were preferred by Program beneficiaries; study should have been accomplished earlier in the life of the Program; cost of study cost-shared with Municipality of Pucarani.
- Partner CPTS targeting to work with industries across the four sectors of interest that are the largest polluters in terms of water quality. Within two of the sectors, tanneries and meat processing, there exist a large number of clandestine, small-scale industries whose cumulative water quality impact is considered significant, although no quantitative data. Program’s work with the largest tannery in El Alto, Bonanza, considered key. For Bonanza, Program technical assistance focuses on less water usage and decreased use of harmful chromium to improve the overall quality of water discharges from the processing facility. Forthcoming challenge - CPTS plans a communications program to reach out to small-scale industries within each of the four sectors to spread downward cleaner production technologies.

Recommendations:

- Application of CPTS slaughterhouse “clean production technologies” to Viacha municipal slaughterhouse.
- Renewed emphasis to engage with additional municipalities within the Cohana Bay watershed to obtain greater impact (beyond Viacha and Pucarani). Forthcoming bilateral agreement between the USG and GOB should be a tool to aid in this endeavor.
- Within the El Alto industry sector, recommend Program develop a competition to encourage small-scale industries to adopt proven cleaner production technologies; Communications Unit would be a key partner in such an endeavor.
- Focus on consolidation of activities within the lower watershed region.
- Increase work in the area of water developments; especially in the Chojasivi region; investigate production of low-cost concrete molds to line dug wells.
- Obtain complete buy-in from four sectors to disseminate cleaner production technologies downward to smaller scale actors within each sector. Consolidate communications, especially as it pertains to producing communication material to assist in the outreach of cleaner production technologies within El Alto.
- Solid waste management: link-up with the “*Fundación Para La Reciclaje*” (FUNDARE) to be more effective in offering solid waste recycling options with local schools.
- Increase awareness for the need for municipal solid waste landfills amongst municipal populations.

- Request a knowledgeable university professional peer review the final(draft) water quality monitoring data/summary report.

Interview Question 3 of 11: Is ProLago utilizing adaptive management in its execution? Give examples.

Commendations:

- Declining EyE budget over the final two years of the Program; field activities shifting from construction of new activities to maintenance of existing activities; to ensure sustainability.
- Production of material in Aymara where possible, rural/low wattage radio programming especially effective.
- Work with Viacha mayoral office to incorporate a solid waste management fee within resident's monthly electric bill to finance solid waste collection and operation of the new landfill.
- Use of local elected "*dirigentes*" to further Program objectives; they are able to open doors with local families with regard to Program activities; more effective than Program technicians operating independently.
- Program to undertake a study of Cohana Bay sediments to determine the presence or absence of heavy metals. "*Tотора*" reed utilizes sediments as a primary nutrient source; reed is a primary feed stock for the regions dairy cows. To test milk and cheese products as well for heavy metals.

Recommendations:

- Re-visit two abandoned water quality/climate change initiatives to determine if new, smaller activities are possible: (1) *Villa Ingenio* landfill serving El Alto – private firm operating the landfill not interested in pursuing the ProLago demonstrated use of landfill methane to run engines to pump leachate back into landfill cells; (2) Puchokollo wastewater treatment plant serving the City of El Alto – methane capture and sale of carbon credits proposed.

Interview Question 4 of 11: From a social-economic viewpoint, how is the Program contributing to improved incomes for rural families working with the Program?

Commendations -Manure is becoming to be viewed as an economic resource by beneficiaries; primarily as raw material for vermicompost and to a lesser extent for biodigesters; leads to less nutrients entering Lake Titicaca.

Interview Question 5 of 11: Considering all ProLago activities, upper and lower watershed, which are capable of being sustainable over the medium- to long-term? Why?

Commendations:

- Development of "veterinary promoters"; much acceptance by local community members. Program's model whereby one veterinarian trains 36 veterinary "promoters".
- Overall, CPTS methodology of working with pilot industries to demonstrate cleaner production technologies and the subsequent transfer to those technologies to smaller businesses in each sector of interest; collaboration with EPSAS critical.
- Program methodology for animal (cow) health whereby early in the Program there was a 50/50 cost share with farmers (vitamins, medicines, etc.) and over time the cost share for farmers increases and towards the end of the Program farmers bear all the costs.

- Program's overall cost-share methodology with farmers – high initial costs for ProLago, declining year by year to 100% of costs borne by beneficiaries.

Recommendations:

- Doubt as to whether CPTS is capable of effectively spreading the message of cleaner production technologies to each of the four production sectors to smaller-scale industries in an effective manner during the remaining two years of the Program. Owing to the lack of clear/coherent communications strategy aimed at effectively spreading technologies amongst disperse, small-scale businesses. Program needs to analyze the situation to determine if CPTS has an adequate campaign for the widespread promotion of clean production technologies amongst small businesses within the four industrial sectors. If inadequate planning has been done; develop plan for the widespread promotion of cleaner production technologies.

Interview Question 6 of 11: How effective has the Program been in achieving coordination amongst partners? Is the Program working with the most effective partners; are there others the Program should be working with? In terms of both internal and external partners.

Commendations:

- Bonanza a key partner since they are the largest tannery in El Alto.
- Municipality of Pucarani: (1) Now views ProLago as a strategic partner; not always the case. (2) Successful dialogue with the Municipality of Pucarani opened the door for Swisscontact to begin direct interactions with the municipality in the area of payment system options for delivery of public services. Synergies have emerged between ProLago and Swisscontact regarding solid waste management work with the Municipality of Pucarani.
- Weekly Program staff meetings commended as a communication tool to ensure synergies across primary Program components. Coordination necessary since CPTS, EyE, Manoff, and IRG activities are very disparate organizations.
- CPTS: (1) Decision to work with a GOB development bank (PROFIN) to secure funding for industries to make needed improvements to production processes to lessen contaminate discharges of waste water. (2) Participation in Bolivia public/private cleaner production roundtable (*AVPML – Acueros Voluntarios de Producción Mas Limpia*); roundtable partners: GOB, industries, and CPTS.
- Existing *Universidad Pública de El Alto* agreement to obtain thesis students to accomplish discrete investigations for PROLAGO. For example, a student is studying the chemical/fertilizer properties of biodigester-produced “biol” for foliar fertilizer use.
- Field offices in Cohana and Chojasivi engage much with communications unit of Program. Obtaining both offices at no charge, donation by each community; ensured community ownership in Program activities.
- Program approach of working with municipal governments (those willing to work with Program) to coordinate all actors working on environmental issues within communities.
- At this time, IRG in process of renegotiating and reviewing performance of both EyE and CPTS sub-contracts to better reflect deliverables for the remaining contract period.
- GIZ: (1) Collaboration to cost-share construction of biodigesters; GIZ assumes 25% of costs involved. (2) Formation of a strategic partnership with GIZ in the construction of biodigesters; GIZ to analyze fertilizer properties of “biol” liquid fertilizer derived from biodigesters.
- Collaboration with other USAID/Bolivia programs in the area of communications expertise.

- June 2011 internal “consolidation” workshop with all partners to address how to achieve standard and custom indicators.
- Very good coordination between field offices (two) and the La Paz office; administrative support to the field.

Recommendations:

- “*Gobernacion*” of La Paz planning a water quality plan for Municipality of Pucarani, but without involvement of municipality; lack of necessary coordination. ProLago should address feasibility of becoming involved in this issue; recognizing the political costs involved.
- Investigate opportunity for a written cooperative agreement between municipalities working with ProLago (Pucarani, Viacha, and possibly Laja); no national GOB policy to support such an agreement. Program to assess political costs involved.
- Some EyE technical personnel (Juan Carlos Enriquez) very results oriented and don’t coordinate optimally with the communications unit; need to improve communications amongst some Program components – this may limit sustainability of the activities.
- Communication issue with respect to Component 1/CPTS: (1) CPTS not very receptive to working with Program communications specialists; demonstrates little interest in working with communications specialists. (2) For remainder of Program – work to strengthened collaboration between CPTS and communications staff (Component 3).
- Remaining two years of Program: (1) Work with existing municipal government partners to collaborate with spreading of Program activities/best management practices to other municipalities. (2) Review cooperation between Components One and Two with respect to the Communications Unit (Component Three) to allow the communications unit to be more effective.

Interview Question 7 of 11: How effective has been the acceptance of Program best management practices/cleaner production technologies within each sector; by beneficiaries?

Commendations:

- Solid waste management plan jointly developed between ProLago and Viacha municipal environmental personnel.
- Sub-mayors of Viacha accompany Program personnel (Jorge Arias) when solid waste management workshops presented; sound collaboration. By holding the workshops on Saturday’s, more residents can attend; oftentimes entire families attend.

Recommendation:

- Program to work with Municipality of Viachato socialize the new solid waste management plan amongst citizens; can be done in conjunction with remaining Program workshops on solid waste management. Social Diagnostic done as part of the new solid waste management plan professionally performed. New plan can serve as a model for other rural Bolivian municipalities. If and when USAID – GOB relations improve, recommend Viacha’s new Plan be shared with the national municipality organization as good model.
- CPTS needs to work closely with the Program’s communications team to develop a realistic plan to widely distribute cleaner production technologies material amongst small- and medium-scale businesses within each of four industrial sectors. Some doubt as to whether the communications team has the capacity to address all of Component One and Two needs during the final years of the Program; complete a diagnostic to address this issue

Interview Question 8 of 11: Have you seen changes in attitudes of Program beneficiaries? Describe.

Commendations:

- ProLago has successfully worked with rural residents to change the paradigm of assistance.
- ProLogo very consistent on repeatedly delivering the message that the number one goal of the Program is to improve water quality in Lake Titicaca; versus a rural poverty alleviation program.

Recommendation: Analysis needed to determine how often El Alto industries, within the four sectors, are accessing CPTS's URL where training and other technical assistance material are located. If material is underutilized, Program communication's personnel to determine how to make information more available/useful.

Interview Question 9 of 11: What has the Program done to find solutions to barriers/bottle-necks to achieve positive changes in traditional practices of rural residents and El Alto businesses? Give examples.

Commendations:

- Ideally local residents did not understand the concept of nutrient runoff from large numbers of cattle negatively impacting CohanaBay water quality, thanks to ProLago, that concept now widely understood/accepted.
- IRG and EyE cost-sharing office space in La Paz to reduce costs.
- Cleaning of Rio Pallina had a direct impact on Lake Titicaca by ensuring a significant tonnage of solid waste did not enter the water body

Recommendations:

- Program needs to work with Municipality of Viachato address need for additional capacity at new landfill.
- Program to invest minimal additional resources in maintenance of the ProLago URL in light of so few visitors.

Interview Question 10 of 11: What measures are being implemented by the Program to ensure women and men are receiving benefits in an equal manner?

Recommendations:

- Investigate production of a limited set of technical training material utilizing easy-to-understand graphics for Aymara speaking women beneficiaries; for those who do not speak or read Spanish. First, investigate how large an audience exists for this material to see if the production is cost effective.
- For a potential Phase II of Program, complete a social impact analysis to assess how best to craft activities/trainings to fully incorporate women.

Interview Question 11 of 11: Describe how the Program is complying with USAID's biodiversity indicators.

Commendation - Consistent water quality/biodiversity message for all potential/actual stakeholders within the CohanaBay watershed.

Recommendation - Biodiversity indicator 2.1.3 not specific to avian monitoring; recommend revision of indicator to make it specific to avian monitoring.

Management Actions:

Commendations:

- ProLago being a relatively small program, employment of a full or part-time GIS person not considered due personnel, hardware, and software costs involved; Program made wise decision to procure GIS products from USAID/Bolivia's ACIDI-VOCA managed program; good example of a strategic partner.
- Municipality of Pucarani views COP Rivas as very effective.
- IRG team for applying financial pressure to CPTS to produce agreed upon deliverables.
- Initiation of university internships with students in two areas: communications and M&E.
- Permanent field presence; offices in Cohana and Chojasivocommunities very effective for local Program delivery. Staffing of two dedicated specialists per office, plus a shared veterinarian for both offices viewed as effective.
- PROLAGO acceptance of \$500K additional USAID funding (non-biodiversity; D&Gfunding) to construct sanitary sewer collection lines in El Alto. El Alto politicians divided whether to spend the funding on a collector system to service 20K residents or an alternative to only serve 400 residents. Either option will work towards collecting water for the City's waste water treatment plan and not having the waste water flow directly into local rivers. Program management effective in navigating the complicated political waters found in El Alto.
- Beneficiaries noted the technical quality of Program technical assistance specialists; especially Dr. Vladamir Vargas, veterinarian.
- Horizontal structure of Component 3 (Communications) that serves Components 1 and 2 well conceived.

Recommendations:

- "Data Quality Assessment" (DQA) not done for Program to date; USAID/Bolivia needs to schedule a DQA as soon as possible. A DQA accomplished late into program execution of limited value.
- Component 3 - Budget has no mention of Component 1 (El Alto industries) campaign to widely disseminate "cleaner production technology" information across the four industrial sectors. Funding too constrained for Component 3; analyze existing budget to determine if it is adequate to meet forthcoming needs; especially with respect to widely distributing El Alto cleaner production technologies. Communications campaign to spread downward, to smaller industries per sector, key to Program sustainability.
- USAID/Bolivia to develop a methodology to ensure sharing of results/processes amongst Mission programs; at this time, some ProLago personnel believe there are opportunities to learn from other USAID programs.
- To comply with the Environmental Threshold Decision/IEE (LAC-IEE-09-68), Program was to have developed an Environmental Assessment (EA) for Component One activities in El Alto; Program undertook EA in a less than timely manner; under development at this time.
- Expand internship opportunities; present a win-win situation for ProLago and for students.
- Area needing improvement – timely approval by USAID/Bolivia of communications material. Program perceives that COTR, Mission leadership, and perhaps embassy review of communications material takes too long. Evaluators learned of an instance

where communications material produced for a municipal solid waste campaign was of no value when it was finally cleared by USAID/Bolivia since the approval process surpassed the date of the field initiative.

- Integrate Global Climate Change (GCC) “Adaptation” concepts into Program, including one or more standard GCC indicators (F). Clean production technologies being implemented within El Alto industries all incorporate the use of less water and improving water quality; directly in line with adaptation strategies necessary to address forthcoming water shortages due to glacial melt (primary source of El Alto/La Paz potable water). GCC Adaptation funding not necessary to incorporate adaptation strategies within a Program; opportunity for Mission to account for “indirect” GCC/Adaptation funding – in line with Agency goals to meet Presidential directive to account for Fast Start funding. A CARE report (*Bolivia: La Resistencia de siglos, la Fortaleza de hoy para enfrentar el cambio climático. Gobernanza, adaptación inclusiva, coaliciones, y cambio climático en un contexto de retroceso de glaciares*) singles out the Municipality of Pucarani as being especially vulnerable to the effects of climate change due to the fact that the watershed within which the municipality is located originates in the “cordillera central” range of Bolivia. Standard F indicator (new for FY2012) to utilize - 4.8.2-26, Adaptive Capacity: “Number of stakeholders with increased capacity to adapt to the impacts of climate variability and change as a result of USG assistance.”
- Additional opportunity to take advantage of “indirect” Clean Energy funding opportunity (Mission receives no “direct” GCC/Clean Energy funding) due to methane production/use from installed biodigesters. Standard F indicator (new for FY2012) to utilize for Clean Energy: “Quantity of greenhouse gas emissions measured in metric tons of CO2 equivalent, reduced or sequestered as a result of USG assistance.”

Recommend a Phase II of Program:

Based on the mid-term evaluation, evaluation team recommends Mission plan for a “phase two” of the Program. Phase II would work in two primary areas: (1) new municipalities to implement water contamination reduction activities (use of cattle manure) and (2) focus on mid- to small-scale El Alto industries to implement proven cleaner production technologies, within exiting four sectors.

- Extend Program to other municipalities along Lake Titicaca; work with municipalities that request USAID assistance; respond to “demand driven” requests for assistance. Investigate collaborative opportunities with USAID/Peru to work on a Lake Titicaca watershed shared by Bolivia and Peru.
- Potential new/expanded geographic foci - Copa Cobana region; municipal government has formally requested assistance at this time. Other municipalities within Lake Titicaca watersheds that express an interest in working with USAID; based on successful ProLago work.
- Scale-up Program - work with wider network of water polluting El Alto industries, within the four established sectors (tanneries, slaughterhouses/meat processing, beverage, and dairy); focus on smaller /clandestine industries within the four sectors. Transfer proven field activities (biodigesters, vermicompost, etc.) to other, new geographic areas.
- Maintain limited support to existing rural promoters.
- Continue to attempt to open doors with the Municipality of El Alto regarding methane capture/use (for clean energy) at the Puchokollo waste water treatment plant and the municipal landfill serving El Alto;

- Complete an analysis to determine which municipalities hold most promise for collaboration/achievement of results.
- Intensify water quality monitoring; increase size of network; seek opportunities for collaboration with GOB agencies.
- Work to strengthen one or more Bolivian water quality laboratories to allow them to meet international/ISO standards.

ANNEX A

Statement of Work

El Alto Lake - Titicaca, Pollution Management Activity – PROLAGO

Performance Evaluation

1. Project Description

Project to be assessed:

El Alto Lake - Titicaca, Pollution Management Activity - PROLAGO is funded through contract No. EPP-I-00-04-00024-00, with International Resource Group (IRG). With a budget of \$US 5,797,981, which will be used for the two phases of the project, the contract is approved for five years, starting in December 9, 2008 and ending in November 9, 2013, using FY07 to FY12 funds, subject to extension of the SEGE SO. The project has had a 4th amendment in May 2011, which allows exercising the option period and increasing its TEC by \$ 500,000, thus totalizing the budget to \$ 6,297,981. However, since this TEC increase is intended to finance the work with the Municipality of El Alto and that agreement has not been signed yet, for the purpose of this midterm evaluation, this amendment will not be taken into account.

2. Background.

The PROLAGO project, implemented by IRG, pursues the following two objectives: (see attached results framework):

- To reduce those threats negatively impacting key biodiversity targets in El Alto – Lake Titicaca region.
- To improve environmental health and quality for residents in targeted areas within the El Alto – Lake Titicaca region.

Within these objectives, the project hopes to achieve:

- 1) An improved culture of conservation in the region.
- 2) An increased awareness of the environmental, economic, cultural and social benefits of a cleaner Lake Titicaca.
- 3) Integrated watershed management.
- 4) Improved agricultural and livestock practices.
- 5) Reduced pollution sources.
- 6) Increased local government capacity to enforce regulations, issue permits, and make inspections.

In achieving the objectives mentioned above, the PROLAGO project will be catalytic in helping Bolivians sustainably manage their natural resources using a landscape approach based on (1) clean production, (2) watershed management, (3) integrating biodiversity conservation with pollution management and, (4) land use best practices, all by using a landscape approach. The project objectives contribute to achieving the following SEGE Strategic Objective Indicators:

- Number of households with increased income as a result of USG assistance.
- Amount of sales generated by firms receiving USG assistance.

The project activities also contribute to achieving the following intermediate results:

- The improvement of agricultural productivity to increase incomes and reduce food insecurity.
- The strengthening Bolivia's ability to respond to the challenges and opportunities posed by climate change.

3. Current Sources of Performance Information – Monitoring Data.

The evaluation team will be expected to meet with the COTR, the Mission Evaluation Officer and members of the USAID staff as appropriate, as well as the contractor for PROLAGO, IRG.

The evaluation team will also review written material related to the project from the following sources:

- USAID contract to IRG – PROLAGO, Original Contract and four amendments.
- PROLAGO PMP and PMP reports.
- IRG quarterly, semiannual, and annual reports.
- PROLAGO COTRs quarterly and field trip reports.

4. Purposes and Uses of the Evaluation.

Through this performance evaluation USAID is interested in identifying which project components are working well and why. Results and recommendations from this evaluation will be used to fine tune and adjust objectives and deliverables for the remainder of the project. It is especially important to evaluate the management and the sustainability prospects of the project's activities.

This evaluation will also help USAID/Bolivia decide, in an uncertain budgetary environment, how to proceed with this project.

The evaluation should illustrate how this project is contributing to achieve the SEGE Strategic Objective, and identify which activities currently address USAID forward initiatives. In the case that it is not addressing USAID Forward, it should identify those modifications that can be undertaken to strengthen the project's support for those initiatives.

The evaluation should provide pertinent information, statistics, and judgments to assist IRG, its implementing partners, and USAID/Bolivia in understanding what is being accomplished technically and organizationally. It should also identify any management, financial or cost efficiency findings that are

exemplary or could be improved. The evaluation will help all involved to better understand the initial results and contributions of the project, and to help re-focus and strengthen it as necessary.

The evaluation results are required by PROLAGO's COTR, USAID/Bolivia and the IRG team in order to evaluate the implementation of the PROLAGO project at the midterm. This evaluation will provide information as to which results and outcomes have or have not been achieved, if the project is working with the appropriate stakeholders and will provide feedback as to which results will likely be achieved by the end of the project's implementation.

The information will be used in order to ensure the application of good practices and, again, to provide for mid-course corrections if required, in the project's objectives or use of indicators. The evaluation findings will be shared within USAID/Bolivia in order to provide information to other environment, biodiversity and productive projects which could benefit from its results, and to provide lessons learned and opportunities for possible future USAID funded activities in this area.

5. General Evaluation Questions.

1. Are current project objectives realistic, appropriate and achievable within the project framework?
2. Are the development hypothesis and the main project objective still correct? Are there any objectives or intermediate results that should be reformulated, considering the current political economic, environmental, biodiversity and social situation? To date, which intermediary results and objectives have been reached? What are the key factors that explain the success or failure in achieving key outcomes and outputs?
3. Is the PROLAGO project currently working with the appropriate stakeholders or are there others who should be considered in order to achieve the objectives and expected results?
4. Is the project's geographic scope appropriate for achieving the project's goals taking into account the biodiversity and socio economic parameters within which it works; are there other areas that should be considered under the present circumstances?
5. How effectively have project stakeholders coordinated amongst each other so far? What modifications could be undertaken to improve the present coordination among stakeholders?
6. The project is being implemented by a consortium led by IRG and three sub-contractors. How have these subs coordinated among each other so far, as a "project team"? Are there any forms of internal articulation that might be improved to facilitate greater coordination? If so, what might they be?
7. Which project activities are likely to achieve sustainability and to reach a level of adoption by beneficiaries and why?
8. Which would be the most relevant elements of success (best practices) and lessons learned identified, that could be applied during the project's remaining life?

9. To what extent is the project contributing to strengthen Bolivia's ability to respond to the challenges and opportunities posed by climate change? (as stated in the SEGE` objectives)
10. Is the project contributing to increasing the incomes and sales for households? And how?
11. Are there any comments or recommendations to improve project implementation to achieve greater impact?

6. Specific Evaluation Questions.

1. What are the most relevant elements for improving the biodiversity conservation and livelihoods in the Titicaca Lake region, introduced by the Project? Is there ownership of project practices by its beneficiaries?
2. Have expected changes in attitudes, knowledge and best practices occurred as result of project implementation?
3. Have the beneficiaries increased or acquired a culture of conservation? Have the beneficiaries increased their awareness of the environmental, economic, cultural and social benefits of a cleaner Lake Titicaca and integrated watershed management?
4. How have the beneficiaries improved agricultural and livestock practices?
5. How have small businesses and industries contributed to the reduction in pollution of Lake Titicaca?
6. From the beneficiary's perspective, is the provided technical assistance contributing to cleaner Cohana Bay?
7. How were those bottlenecks preventing the change in attitudes and adoption of project practices removed or reduced? What, specifically, were the mechanisms used to affect this change in attitude or adoption of good practices?
8. Does the project contribute to strengthening equal access to both women and men regarding the sustainable development of and access to a clean environment?
9. Is the project currently complying with the four agency's key biodiversity criteria? Is the project complying with the biodiversity code? (1) Does the project have an explicit biodiversity objective? 2) Have project activities been identified based on an analysis of threats to biodiversity? 3) Does the project monitor associated indicators for biodiversity conservation? 4) Does the project have the intent to positively affect biodiversity in biologically significant areas?

7. Suggested Evaluation Methodology.

The evaluation methodology that should be used is a formative process and exploratory evaluation, mainly focused on: outcomes achieved, how the project is being implemented, assessing whether it

conforms to its original design, and documenting its development and operation. The evaluation should be based primarily on direct field observation.

The evaluation should be carried out in 5 weeks and should consider the following four Phases:

1. Literature Review

This phase involves reading and understanding the documents related to this project including: the project contract, all contract amendments and quarterly reports, results of PMP indicators through project life, the project's indicators baseline, field reports and other important information defined by the COTR.

A secondary literature review will complement the first, mostly to gather relevant information from second-hand sources, such as *Instituto Nacional de Estadística* (INE), any socio-economic data available on the beneficiaries, reports on Lake Titicaca's pollution levels, and others deemed relevant.

2. Information Compilation and Analysis

This phase involves compiling all of the information gathered in field surveys. This should help identify to what extent the project is achieving its main results and objectives as described in the contract and its results framework. It is important that surveys are conducted with beneficiaries, community members, relevant industries and any project stakeholders, in order to provide a robust set of data from which to complete the analysis.

Once the evaluation team has gathered the principal data it will decide if that information is sufficient. If it is not, they will need to conduct complementary surveys, as needed.

3. Draft Recommendations

Once the above information has been analyzed, the evaluation team presents a draft document including their findings and recommendations to USAID/Bolivia.

Having received comments from USAID/Bolivia the document will be revised and presented as a final document to be approved by USAID/Bolivia. Upon completion, the final document should be presented via power point presentation to the USAID/Bolivia Mission for review and comment.

4. Final Report

The final document shall include all of the findings and recommendations of the evaluation team, and will address all USAID/Bolivia comments and concerns. Upon its approval, the final document will be presented to the Mission in a presentation, be it Powerpoint or any other appropriate form of presentation.

8. Deliverables and Timeframe.

Deliverables:

1. **Work Plan:** The team will prepare a detailed work plan which will include the methodologies to be used in the evaluation. The work plan will be submitted to the mission evaluation officer and COTR at USAID/Bolivia for approval no later than the 5th day of work.
2. **Draft evaluation report:** A draft report that includes the findings and recommendations of the evaluation should be submitted to USAID/Bolivia, within the first 20 working days. The written report should clearly describe findings, conclusions and recommendations. USAID will provide comments on the draft report within one week of submission.
3. **Final report:** The team will submit a final report that incorporates the team responses to mission comments and suggestions no later than five days after USAID/Bolivia provides written comments on the team drafts evaluation report.
The final report should include the contents listed on "11) Requirements for Reporting and Dissemination". The final report will be edited and formatted and sent to the DEC approximately one month after the Mission has reviewed the content and approved the final revised version.

Timeframe: The evaluation of PROLAGO will take approximately 25 working days. According to the following schedule:

9. Composition of Evaluation Team.

The team will be composed of one or more international consultants and at least two local consultants.

The team should include specialists of the following areas of expertise:

- **Team Leader:** Should be a senior consultant with Master's degree, preferable PhD on sustainable development, national resources or related degree in sustainable development; should have at least ten years of senior level experience working in biodiversity projects and programs in a developing country (preferably in Latin America); and should be familiar with industrial pollution, USAID regulations 216 and USAID forward initiatives. Should have extensive experience in conducting qualitative and quantitative evaluations and have excellent oral and writing skills in English and Spanish. The team leader should also have experience in leading evaluation teams and preparing high quality documents. He/she should also have wide range of experience in implementing USAID-funded programs and good understanding project administration, financing and management.
- **Biodiversity Specialist:** Should be an independent consultant with at least a Master's degree, but preferably a PhD in biodiversity or sustainable development; should have at least 8 to 10 years of experience working in water pollution, and biodiversity issues related to Lake Eco systems; and should have experience working in Latin-American countries, preferably in Bolivia. Should have excellent skills in oral and written English and Spanish.
- **Sociologist – Behavioral Change Specialist:** Should have a Master's degree, but preferably a PhD in Sociology, with a good background in gender analysis and with broad experience in

community behavior and behavior change, in developing countries. Should have 8 to 10 years of experience working with rural community behavioral change in developing countries. Should have excellent skills in oral and written English and Spanish.

- **Environment Specialist:** Should be an expert in brown pollution issues, industrial, commercial and urban wastes, with a Master`s degree, or PhD, in the environmental sciences. Good knowledge of Spanish and English. 8-10 years of progressive experience on environmental studies and issues.

10.Procedures: Scheduling and logistics.

- Implementing partners: USAID/Bolivia will provide assistance in arranging meetings with contractors, state representatives, project beneficiaries and other key stakeholders. The Mission will make available all relevant documents.
- The evaluation team will be required to spend 40% of time in the field, understanding field as project implementation place, stakeholder`s offices, and beneficiaries working and living environment, etc.

11.Requirements for reporting and dissemination.

The format for the evaluation report is as follows:

1. **Table of Contents.**
2. **Executive Summary** – Concisely state the most salient findings and recommendations.
3. **Introduction** – Presents the purpose, audience and synopsis of the evaluation.
4. **Background** – Brief overview of PROLAGO in Bolivia, project results framework, development hypothesis, USAID program strategy and activities implemented in response to the problem,.
5. **Methodology** – Describe evaluation methodology, including constraints and gaps.
6. **Findings/Conclusions and Recommendations** – For each objective area. Also include data quality and reporting system that should demonstrate verification of spot checks, issues and outcome.
7. **Issues** – Provide a list of key technical and/or administrative issues, if any.
8. **Future Directions, for mid-course directions, project competition and future opportunities, within the context of USAID forward.**
9. **References** – Bibliographical, documentation consulted.
10. **Annexes.** Consider evaluation methods, evaluation tools: sample, control groups and experimental group`s selection, surveys template, schedules, interview list, focus groups discussion.

12. Illustrative Budget.

ITEM	Unit of Measure	No.	Unit Cost	Quantity	Total
Daily Salary - Primary Expatriate Consultant (Team Leader and expert) (2)	Daily Rate Salary	2	550	15	16,500
Travel to Bolivia from USA	Air Ticket	2	2,700	4	10,800
Internal Travel within Bolivia	Earth Travel	1	100	5	500
Local Bolivian Experts (2)	Daily Rate Salary	2	320	25	16,000
Internal Travel within Bolivia	Earth Travel	2	130	5	1,300
Materials	Global	1	1,000	1	1,000
Surveys and/or focus groups*	Global	1	3,000	1	3,000
TOTAL					49,100

13. Selection criteria

The proposal to conduct the assessment, whose terms are described above, will be judged based on the following technical criteria **(100 points total)**:

1. Personnel qualifications and team composition **(40 points)**. The personnel qualifications include the experience, knowledge and skills of the proposed personnel in relation to the requirements of the specified work.
2. The technical feasibility and appropriateness of the proposal **(40 points)**. This includes: a) demonstration of understanding of the requested work and product; and b) the strength, quality and reasonableness of the methodology to be applied.
3. Past experience **(20 points)**. This refers to the capacity of the contractors (local and international) to carry out the assigned work as judged from past experience and performance on related assignments.

The following sub-criteria will be used to evaluate the bidder's cost proposal (no points):

- Cost Realism: This evaluates the bidder's ability to achieve the expected results in its proposal within the estimated cost.
- Validity of Costs as proposed by the bidder: This evaluates the bidder's proposed costs in relation to the proposed technical effort and with respect to the bidder's understanding of the statement of work's requirements and its management approach.

Drafted: Álvaro Luna COTR/Ximena Rodriguez Misión M&E Specialist.

Cleared: Walter Acarapi M&E SDE office-----date-----

Cleared: Eduardo Galindo SDE Director a.i. ----- date-----.

Cleared: Ximena Rodriguez Mission M&E Specialist----- date-----.

Cleared: Virginia Moscoso, Program Director a.i. -----date-----.

Cleared: Wayne Nilsestuen, Mission Director-----date-----

ANNEX B

ProLago Mid-term evaluation

Evaluation Team Workplan

Dates of work: October 17 - 28, 2011

Brief Overview: The USAID funded ProLago project is in the third year of a five-year program. USAID-Bolivia staff have requested a mid-term review be performed of the project and its three components: 1) Reducing the pollution from industries in El Alto, 2) Reducing the pollution from rural inhabitants around the Cohana Bay, and 3) Communications across both sectors. This program is funded by restricted Biodiversity Funding, therefore a cross-cutting focus of the evaluation team will be adherence to Biodiversity funding criteria.

Proposed Activities: The ProLago mid-term evaluation team, consisting of Bruce Bayle (US Forest Service) and Bronwyn Llewellyn (USAID) will remain in Bolivia for a total of two weeks, from October 17th to 28th, to conduct interviews, visit field sites, review documents, and prepare a presentation of initial findings and a draft report for the USAID-Bolivia Mission, as detailed in the Scope of Work.

The team will commence by creating a list of interview questions (in Spanish) to guide conversations with both project staff and external partners. This list of questions will be based on those posted in the Scope of Work, however will be consolidated and rewritten to increase ease of response during interviews. *Please see Annex I for the final list of interview questions, in both Spanish and English.*

The team will conduct interviews of project staff in La Paz, USAID staff, partners – including municipal authorities and other donors – as well as IRG field staff and beneficiaries both in El Alto (Component 1) and around Cohana Bay (Component 2). *Please see Annex II for a list of interviewees.*

Once the interviews are completed, the team will consolidate interview responses and reviewed literature, then prepare a draft evaluation document for review by mission staff, as well as a presentation to mission management of initial findings.

A final document will be prepared by the team after their return to Washington, incorporating any comments by mission staff.

Proposed timetable:

- Monday, 17 October. Meet with Project Staff at IRG offices and USAID Mission, develop consolidated interview questions.
- Tuesday, 18 October. Individual interviews with IRG (and subsidiaries: Ecología y Empresas (EyE), Manoff Group, and Centro de Promocion de TecnologiasSostinibles (CPTS))
- Wednesday, 19 October. Field visit to interview Alcalde of Viacha, afternoon visits to CPTS partner enterprises including meat and leather factories.
- Thursday, 20 October. Interview with Pucarani Municipality officials, field visit to Cohana bay beneficiaries, and interview of project field staff.
- Friday, 21 October. Final project staff interviews at IRG.
- Monday, 24 October. Work in hotel, interview of USAID COTR.

- Tuesday, 25 October. Field visit to Chojasivi beneficiaries and interview with project field staff.
- Wednesday, 26 October. Work in hotel, interview of GTZ partner staff.
- Thursday, 27 October. Work in hotel
- Friday, 28 October. Presentation of draft evaluation and findings to USAID-Bolivia mission staff.

ANNEX C

MEMO

DATE: October 28, 2011
SUBJECT: Overview - PROLAGO Mid-Term Evaluation
TO: Wayne Nilsestuen, USAID/Bolivia Mission Director
FROM: Bruce Bayle, LAC/RSD/Envir. & Bronwyn Llewellyn, EGAT/NRM

TDY of Bayle and Llewellyn has been responsive to the Mission approved SOW for the PROLAGO Mid-Term Evaluation. SOW called for 11 “general evaluation questions” and 9 “specific evaluation questions”; with consent of Mission’s Program Office, 20 total evaluation questions were distilled down to 11, plus a new section addressing PROLAGO team “management actions”.

1. Program delivery to date:

- a. In spite of strained USAID – GOB relations, Program has made significant progress working towards improvement of water quality, and biodiversity, in Lake Titicaca.
- b. Program deliverables divided into 3 geographic/sectoral areas:
 - i. Partner “*Centro de Promocion de TecnologiasSostenibles*” (CPTS) work with 4 water polluting sectors in El Alto (tanneries, slaughterhouses, beverage, & dairy). Progress to date has been relatively slow, but good prospects for significant waste water quality improvements for 8 demonstration industries.
 1. Largest tannery in El Alto, Bonanza, working towards significant reductions in use of chromium in processing hides.
 - ii. Partner “*Ecologia y Empresa*” (EyE) work in the lower watershed directly with rural farmers to reduce water contamination has produced significant results:
 1. Vermicompost – unexpected, sig. income generation; sale of humus.
 2. Stable construction – significantly higher milk production.
 3. Biodigester development – 50% savings of bottled gas for beneficiaries; unrealized fertilizer gains from use of “biol” on potato/grain crops.
 4. Animal health – training of vet promoters/techs viewed as sustainable.
 - iii. Partner: “*Manoff Group*” works in close collaboration with 2 primary PROLAGO partners on communications.
 1. Radio programming (in Aymara) in rural areas particularly successful at spreading Program messages.
 2. CPTS has been slower to interact with communication staff.
- c. Contract management – Through COP Carlos Rivas, IRG has been effective in achieving deliverables within a challenging political environment.
 - i. Significant strides working w/municipal governments of Viacha&Pucarani.
 - ii. Good collaboration with GTZ and Swisscontact.

2. Program delivery during next two years (until contract termination):

- a. CPTS challenge – through producer associations, one-on-one dialogues, and utilization of Program’s “communications unit”, widespread promotion of “cleaner production technologies” with small-scale industries of each of 4 industrial sectors.
- b. EyE/lower watershed work – consolidation of implemented activities with rural residents that work towards sustainability.
 - i. Direct economic benefits to beneficiaries for many field activities leading to sustainability.
 - ii. Continued regular technical assistance visits with beneficiaries.

- c. If and when the national USAID-GOB political environment improves, work with discrete activities (solid waste management & waste water management) with new municipalities within the Bahia Cohana watershed; no new larger-scale initiatives.
 - i. Consolidation phase.
 - d. Prospects for significant water quality improvement to Cohana Bay – due to the nature of up-stream (El Alto) and downstream (20K cattle around bay) problem – not envisioned at end of 4 years. However, significant decreases in contamination expected for a sub-set of all farmers within the Cohana Bay watershed, as well as specific industries in El Alto, will lay a framework that should result in the expected water quality improvements past the life of the program.
3. Prospects for a Phase II of Program:
- a. PROLAGO has put together a package of urban and rural activities with good prognoses for sustainability that should be applicable elsewhere in watersheds of Lake Titicaca.
 - i. Recommendation is not to break new ground with field/rural activities, but rather to replicate proven suite of activities.
 - b. Expand geographic scope to new municipalities. At this time, Program has a formal request from the Municipality of Copacabana to initiate activities there.
 - c. Investigate potential USAID/Bolivia – Peru replication of water contamination projects for Lake Titicaca watersheds spanning both countries.

ANNEX D

INTERVIEW QUESTIONS - PREGUNTAS PARA LAS ENTREVISTAS - (English/Spanish) 24 de Octubre de 2011

1. *¿El “marco lógico”, los “objetivos específicos”, y los “resultados esperados” (7) son adecuados, realistas, y alcanzables dentro del programa ProLago?*

Are the logical framework, specific objectives, and desired results (7) adequate, real, and achievable within the timeframe of the Program?

2. *Los indicadores hacen un buen trabajo de medir “outputs”. ¿Qué puede hacer el programa para hacer un mejor trabajo de medir impactos?*

Program indicators do a good job of measuring program outputs; do they do a good job of measuring the impact of activities?

3. *¿El programa ProLago está aplicando manejo adaptivo? Darnos ejemplos.*

Is ProLago utilizing adaptive management in its execution? Give examples.

4. *¿Punto de vista socio-económico - cómo está contribuyendo el programa a mejores ingresos para las familias involucradas en el programa?*

From a social-economic viewpoint, how is the Program contributing to improved incomes for rural families working with the Program?

5. *¿Tomando en cuenta todas las actividades de ProLago, cuales pueden alcanzar un nivel de sostenibilidad en el mediano o largo plazo? ¿Por qué?*

Considering all ProLago activities, upper and lower watershed, which are capable of being sustainable over the medium- to long-term? Why?

6. *¿Cuán efectivo ha sido la coordinación entre socios? ¿Está trabajando con los socios más efectivos; hay otros que el programa debe estar trabajando? En términos de socios internos y externos.*

How effective has the Program been in achieving coordination amongst partners? Is the Program working with the most effective partners; are there others the Program should be working with? In terms of both internal and external partners.

7. *¿Cuál ha sido la aceptación de mejores prácticas/mecanismos de producción mas limpia por sector y/o socios?*

How effective has been the acceptance of Program best management practices/cleaner production technologies within each sector; by beneficiaries?

8. *¿Cuáles han sido los cambios de actitudes y conocimientos por parte de los beneficiarios del programa? Describa los cambios.*

Have you seen changes in attitudes of Program beneficiaries? Describe.

9. *¿Qué ha hecho el programa para superar las barreras para hacer cambios positivos en las prácticas tradicionales de la gente/empresas? Darnos ejemplos.*

What has the Program done to find solutions to barriers/bottle-necks to achieve positive changes in traditional practices of rural residents and El Alto businesses? Give examples.

10. *¿Qué medidas está tomando el programa para asegurar que mujeres y hombres están recibiendo beneficios del programa de igual manera?*

What measures are being implemented by the Program to ensure women and men are receiving benefits in an equal manner?

11. *Describe el proceso de cumplir con los 4 criterios de biodiversidad de USAID.*
- ¿El programa tiene un objetivo explícito sobre el tema de biodiversidad?*
 - ¿Han basado las actividades de ProLago según un análisis sobre las amenazas a la biodiversidad?*
 - ¿El programa hace monitoreo sobre los indicadores de biodiversidad?*
 - ¿El programa tiene el propósito de cambiar en una forma positiva la biodiversidad en uno o mas áreas significativas?*

Describe how the Program is complying with USAID's biodiversity indicators.

- Program has an express biodiversity objective?
- Program activities are based on a threats analysis to biodiversity?
- Is the Program monitoring for biodiversity indicators?
- Does the Program have as a purpose to change biodiversity in a positive manner within one or more biologically significant areas?

**ANNEX E
INTERVIEW LIST**

Name	Title	Affiliation	Interview Date
Holly Ferrette	Global ClimateChange Director	USAID/Washington, DC	Sept. 27, 2011
Anne Lewmandowsky	Program Manager	IRG (Washington, DC)	Oct. 3, 2011
Ricardo Roca	Former COTR – ProLago	Independent Contractor; Ghana	Oct. 6, 2011
Carlos Rivas	Chief of Party	IRG	Oct. 18, 2011
Ana Elio	AdministrativeAssistant	IRG	Oct. 18, 2011
Carlos Meave	Program Manager	Ecología y Empresa	Oct. 18, 2011
Alejandro Paniagua	Monitoring&Eval. Specialist	ProLagoTeam	Oct. 18, 2011
Boris Urquizo	CommunicationsSpecialist	Manoff	Oct. 18, 2011
Jorge Arias	Citizen participation Specialist	ProLago Team	Oct. 18, 2011
Alvaro Azurduy	Rural Technical Assistance Team Leader	ProLago Team	Oct. 18, 2011
Justo Zapata	Cleaner Production Specialist	<i>Centro de Promocion de Tecnologias Sostenibles (CPTS)</i>	Oct. 18, 2011
Daysi Guaman	Cleaner Production Specialist	CPTS	Oct. 18, 2011
Juan CristobalBirbuet	Cleaner Production Specialist	CPTS	Oct. 18, 2011
DelfínMamani Escobar	Mayor	ViachaMunicipality	Oct. 19, 2011
JesúsJurado	Sub-Mayor, Human Development	ViachaMunicipality	Oct. 19, 2011
Ciprián Córdova	Sub-Mayor; District 1	ViachaMunicipality	Oct. 19, 2011
Clemente Calle	EnvironmentalUnit Director	ViachaMunicipality	Oct. 19, 2011
Marcelino Callisaya	Financial Manager	Viacha Municipality	Oct. 19, 2011
Jorge Cruz	Planning Director	Viacha Municipality	
Ing. Juan Carlos Phillisberg	General Manager	Tusequis (sausageproducer)	Oct. 19, 2011
Richard Zuñiga	Production Manager	<i>Industrias de Cuero Bonanza XXI</i>	Oct. 19, 2011
Gabriel Sander	TannerySpecialist	<i>Empresa ATC – Brasil</i>	Oct. 19, 2011
Miltón Flores	Manager	<i>Metal mecánica ESMAR MF</i>	Oct. 19, 2011
Rocio Butron	Productive development & environmental unit manager	Municipality of Pucarani	Oct. 20, 2011
Javier Flores	Deputy environmental unit manager	Municipality of Pucarani	Oct. 20, 2011
Felix EloyConde	Beneficiary	Cohana region	Oct. 20, 2011
Juana Carisaya	Beneficiary	Cohana region	Oct. 20, 2011
Alejandro Juanco	Beneficiary	Cohana region	Oct. 20, 2011
Juan Carlos Maca	Beneficiary/Veterinary Promoter	Cohana region	Oct. 20, 2011
Ricardo Conde	Beneficiary	Cohana region	Oct. 20, 2011

Julia Osco Conde	Beneficiary	Cohana region	Oct. 20, 2011
Policarpo Lopez	Beneficiary	Cohana region	Oct. 20, 2011
Edgar Conde	Beneficiary; former “dirigente”	Cohana region	Oct. 20, 2011
Ruben Juancayo	Beneficiary/Veterinary promoter	Cohana region	Oct. 20, 2011
Alfredo Conde	Beneficiary	Cohana region	Oct. 20, 2011
Dr. Vladamir Vargas	ProLago Veterinary	ProLago Team	Oct. 20, 2011
Ernesto Piuca	Technical assistance expert	ProLago Team	Oct. 20, 2011
Fernanddo Guzman	Technical assistance expert	ProLago Team	Oct. 20, 2011
Marcos Arce	Water Monitoring Specialist	ProLago Team	Oct. 21, 2011
Alvaro Luna	COTR	USAID/Bolivia	Oct. 24, 2011
Claudio Callisaya	Beneficiary	Chojasivi region	Oct. 25, 2011
Sergio Limachi	Beneficiary	Chojasivi region	Oct. 25, 2011
Vicente Limachi	Beneficiary	Chojasivi region	Oct. 25, 2011
Daniel Limachi	Beneficiary	Chojasivi region	Oct. 25, 2011
GenaroLecona	Beneficiary	Chojasivi region	Oct. 25, 2011
Angela Flores	Beneficiary	Chojasivi region	Oct. 25, 2011
FrancisoAlanoca	Beneficiary	Chojasivi region	Oct. 25, 2011
Enrique Cerna	Beneficiary	Chojasivi region	Oct. 25, 2011
Ramiro Huanca	Technical assistance expert	ProLago Team	Oct. 25, 2011
Carls Cuevas	Technical assistance expert	GIZ (formerly GTZ)	Oct. 28, 2011
Gabriel Paco	Technical assistance expert	GIZ (formerly GTZ)	Oct. 28, 2011

ANNEX F

Sustainability index of PROLAGO field activities:

Field Activity	Sustainability Probability
Earth worm “hot houses” (humus production)	Sustainable; income producing activity
Biodigesters	Most likely sustainable; replacement costs of large, black polyethylene bags could render them unsustainable.
Stables	Sustainable; significant increases to milk production. New stables – perhaps not sustainable.
Water harvesting from stable roofs	Sustainable; low technology
Water well perforation	Sustainable; low technology, low costs
Development of veterinary promoters	Sustainable; promoters charge for services rendered
Animal Health (vitamins, de-parasitizing, etc.)	Sustainable via veterinary promoters; pay for fee service
Artificial insemination	Sustainability doubtful – issue is obtaining necessary hardware to perform inseminations.
Family-level totora (lake reed) management plans	Improved practices learned sustainable.
Silage production	Improved practices learned sustainable.
Pasture management/conservation	
Water quality monitoring system/network	Not sustainable; lack of GOB buy-in
Municipal/urban solid waste management	Sustainable when costs can be passed on to local residents via utility bills.
Cleaner Production Technologies with El Alto Industries:	
Tanneries (2 demo industries)	Sustainable; lower production costs
Slaughterhouses/Meat processing(2 demo industries)	Unknown - composting/earth worm decomposition requires active management costs (not significant)
Dairy products (2 demo industries)	Unknown - composting/earth worm decomposition requires active management costs (not significant)
Beverage industries (2 demo industries)	Unknown - composting/earth worm decomposition requires active management costs (not significant)

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