



Apoyamos a **comunidades** a proteger su **agua** a través de la conservación de sus **bosques**

ANNUAL REPORT 2012

CHACO PROJECT

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USAID
FROM THE AMERICAN PEOPLE



This report describes the activities undertaken for the 2012 Annual Work Plan and Annual Operating Plan, which were approved by Natura’s board of directors, the main funder USAID, and counterpart funders: IUCN, DOEN and Forest Trends, and details the achievements accomplished in 2012.

Background

The Bolivian Nature Foundation (Natura Bolivia) is dedicated to preserve critical ecosystems through water and biodiversity conservation. Previous conservation efforts based on command and control have been hard to implement considering the magnitude of resources and logistics required to ensure compliance. The result is that land use change has continued, biodiversity has continued to disappear and ecosystem and watershed services have been lost. Moreover, paternalistic projects, without clear conditionality or assigned responsibility, have been relatively unsuccessful in achieving either of their dual conservation and sustainable development goals. Such projects, in which there is no compliance mechanism once incentives have been provided, have invariably failed to change behavior of farmers or achieved sustainable conservation. Since 2003 Natura has been implementing a pro-poor alternative scheme of Compensation for Environmental Services (CES), which is based on directly linking the economic incentives for project beneficiaries with the preservation of natural resources. This “shared benefits, shared responsibilities” relationship has based in the first instance in one of the most important ecosystem services to humans: water.

Reciprocal Watershed Agreements (RWA) is a tool that tries to achieve the conservation of important biodiversity areas. It provides benefits to local population and at the same time ensures the maintenance of water for irrigation and domestic uses. In addition, RWA facilitates institutions creation and capacity building that can ensure sustainable mitigation and adaptation to climate change.

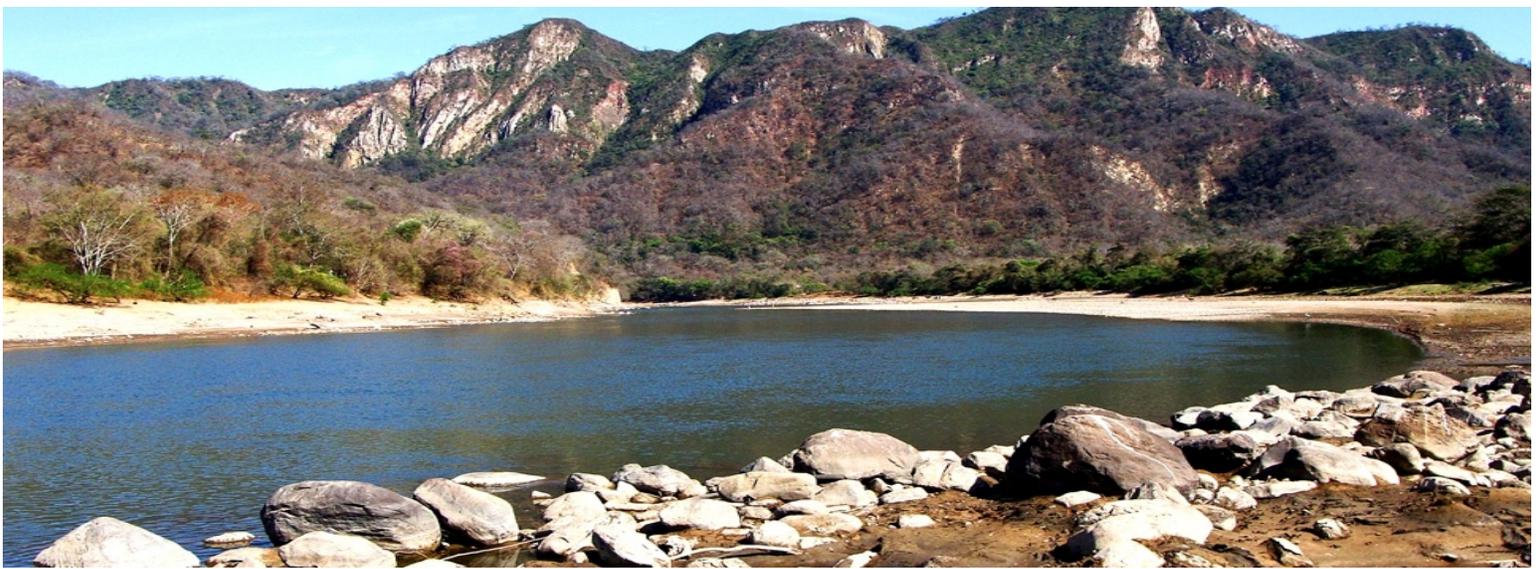


Since 2003 Natura has focused its efforts to preserve water sources located in and around the Amboró National Park and its Integrated Management Area, the Parabanó Municipal Protected Area and Rio Grande middle watershed in the Rio Grande Integrated Management Natural Area - Valleys of Santa Cruz (ANMI RG-VC), key areas in biodiversity and environmental functions that comprise the "Elbow of the Andes". By the end of 2012, Natura Bolivia was implementing RWA in 22 municipalities of Santa Cruz valleys, incorporating:

- **Municipalities.** - Local government entities close to citizens that offer governmental support to the sustainability of conservation initiatives and whose mission is to ensure water provision to citizens and natural resource management.
- **Water Cooperatives or Companies in charge of Water Provision (EPSA).** - Entities that are responsible for water distribution: Generally, they are led by a board of directors elected by the members or users of water in communities situated downstream.
- **Communities or small producers** located upstream. They receive compensation packages or direct incentives, which became new income opportunities based on non-consumptive forest activities that help maintain the natural hydrological cycle.

Operationally, an RWA scheme begins when the municipality, the Water Cooperative (or other water management body) and Natura Bolivia create a **local fund** that will grow thanks to consensual and voluntary contributions from downstream water users. These contributions are added to payment of invoices or receipts of the water service distribution provided by the Water Cooperative, who manages these resources in a differentiated bank account to ensure transparent management. All these funds are invested only in alternative conservation activities and to diversify economic incomes to upstream communities. Natura Bolivia, the municipality and the Water Cooperative allocate their own resources to remunerate their staff and pay other operating expenses.

During 2011, Natura expanded its area of work further southwards into the corridor from the Elbow of the Andes to the Chaco. The goal of this expansion, funded by USAID was to support sustainable development in the mountainous upstream communities, and help conserve the water-provisioning functions of the biodiverse Bolivian-Tucuman forests for downstream domestic consumption and irrigation in the communities of the Chaco.



Natura Bolivia’s purpose was thus to replicate the experience gained in implementing RWA schemes in the inter Andean valleys, in the **Chaco**.

The project was designed to improve the quality and quantity of water so that families located in the Chaco region could increase their productivity and diversify their incomes. The project intends to protect the forests that generate more than 3 million cubic meters of water per year, which are exploited by larger population centers and communities of the Chaco region.

Our theory of change is presented below: the upstream deforestation that is disturbing the hydrological cycle, exacerbating poverty and causing flood/drought cycles in the Chaco, can be reduced through the implementation of upstream-downstream alliances (reciprocal watershed agreements) that simultaneously a) provide upstream development alternatives b) maintain/improve dry season water supplies c) stabilize agricultural yields and reduce downstream poverty.



Matching initial work areas with the “Elbow of the Andes” and the Bolivian Chaco region

Development Barriers	Institutional failures	Barrier Removal Strategy	Expected behavior Change	Development Result
1. Upstream poverty leads to deforestation, increased runoff & low infiltration -> downstream wet season flooding then dry season water scarcity	No positive incentive to develop alternative land uses, and no locally acceptable punishment for indiscriminate deforestation	Compensation packages will make conservation an economically viable alternative that benefits upstream landowners. Municipal governments will make compensation support conditional on stopping deforestation	Upstream owners of forest lands leave critical forest standing	1a Water producing forests protected 1b Upstream incomes increase
2. Dry season water scarcity -> agricultural failure -> continued downstream poverty	Agriculture is based on flood irrigation, which given declining water yields, will never reduce poverty	Municipality-led demonstration projects (such as drip irrigation and honey production) will provide alternatives to downstream flood irrigation	Chaco irrigators associations and others see value of developing sustainable production systems	2a More efficient downstream water use 2b Incomes increase downstream
3. No awareness of relationship between upstream deforestation and water scarcity -> no downstream interest in water shed management -> no sustainable local solution	Municipal governments, water cooperatives and irrigators associations do not invest in protection of water supplies	Led by municipal governments, downstream water users will capitalize water funds as sustainable financing mechanisms to ensure that the project's development and institutional advances are sustainable	Downstream water users contribute economically to watershed conservation and ensure their own long term water supplies	3a Water supplies secured downstream 3b Chaco downstream residents livelihoods enhanced

Results according to the project logical framework

According to the work plan and monitoring plan approved by Natura Bolivia and USAID, we defined the following project outcomes and goals.

Results Framework

AO: Forest preservation to improve water quantity and quality and benefit agricultural production and communities drinking water

IR 1. Chaco Forests preserved
40,000 ha

IR 2. Local Funds created and Strengthened

(Under contracts between municipalities, Natura and water cooperatives)
6 funds

IR 3. Agricultural technology improved
10,000 ha

Specific Indicators

- 1.1.** Number of hectares under improved NRM (*Natural Resources Management*) as a result of USG assistance (SEGE)**
- 1.2.** Number of people receiving USG supported training in NRM and/or biodiversity conservation (SEGE)**

Specific Indicators

- 2.1.** Number of Local Funds created
- 2.2.** Water Cooperatives and community-based organizations (CBOs) strengthened and receiving USG assistance (14 organizations)

Specific Indicators

- 3.1.1.** Number of additional hectares under improved technologies of management practices as a result of USG assistance. **
- 3.1.2.** Number of families improving technology and management agricultural practices

** USAID indicators

Prioritization and classification of project intervention areas

The Chaco project had among its 5-year objectives the preservation of at least 40,000 hectares, constituting a factory of drinking water and irrigation for many communities of the Bolivian Chaco.

Indicator	Annual Targets					
	FY12	FY13	FY14	FY15	FY16	LOP
Hectares under improved NRM as a result of USG assistance	0	10,000	10,000	10,000	10,000	40,000
People receiving USG supported training in NRM and/or biodiversity conservation	0	125	125	125	125	500
Local funds created	6	0	0	0	0	6
Water cooperatives and communities-based organizations (CBOs) strengthened and receiving USG assistance	0	0	4	5	5	14
Additional Hectares under improved technologies of management practices as a result of USG assistance	0	0	3,000	4,000	3,000	10,000
Families improving technology and agricultural practices	0	0	150	200	150	500

Water is an extremely scarce resource in the Chaco, with a rainfall of less than 500 milliliters per year, which makes it a semiarid ecosystem. To achieve the project's conservation goals, and to support the existing network of protected areas in the region (see figure below), Natura approached 12 municipalities and their respective public service institutions, proposing the implementation of a series of RWA along the corridor of where the Andes meet the Chaco.

The following municipalities were invited to be part of the project: Cabezas, Gutierrez, Camiri, Cuevo and Boyuibe in the Department of Santa Cruz, Monteagudo, Villa Vaca Guzman, Macharetí, Huacareta and Huacaya in the Department of Chuquisaca, and Caraparí, Villa Montes and Yacuiba in the Department of Tarija.

To achieve the commitment of the authorities of municipalities and governors of the Chaco region, **three (3) exchanges** were organized to share and learn from other municipalities that have several years of experience implementing RWA schemes in the Santa Cruz Valleys.



Mayor of Quirusillas (Santa Cruz valleys) presenting the RWA concept to authorities of municipalities and sub-prefectural governments of Caraparí, Villa Montes and Yacuiba

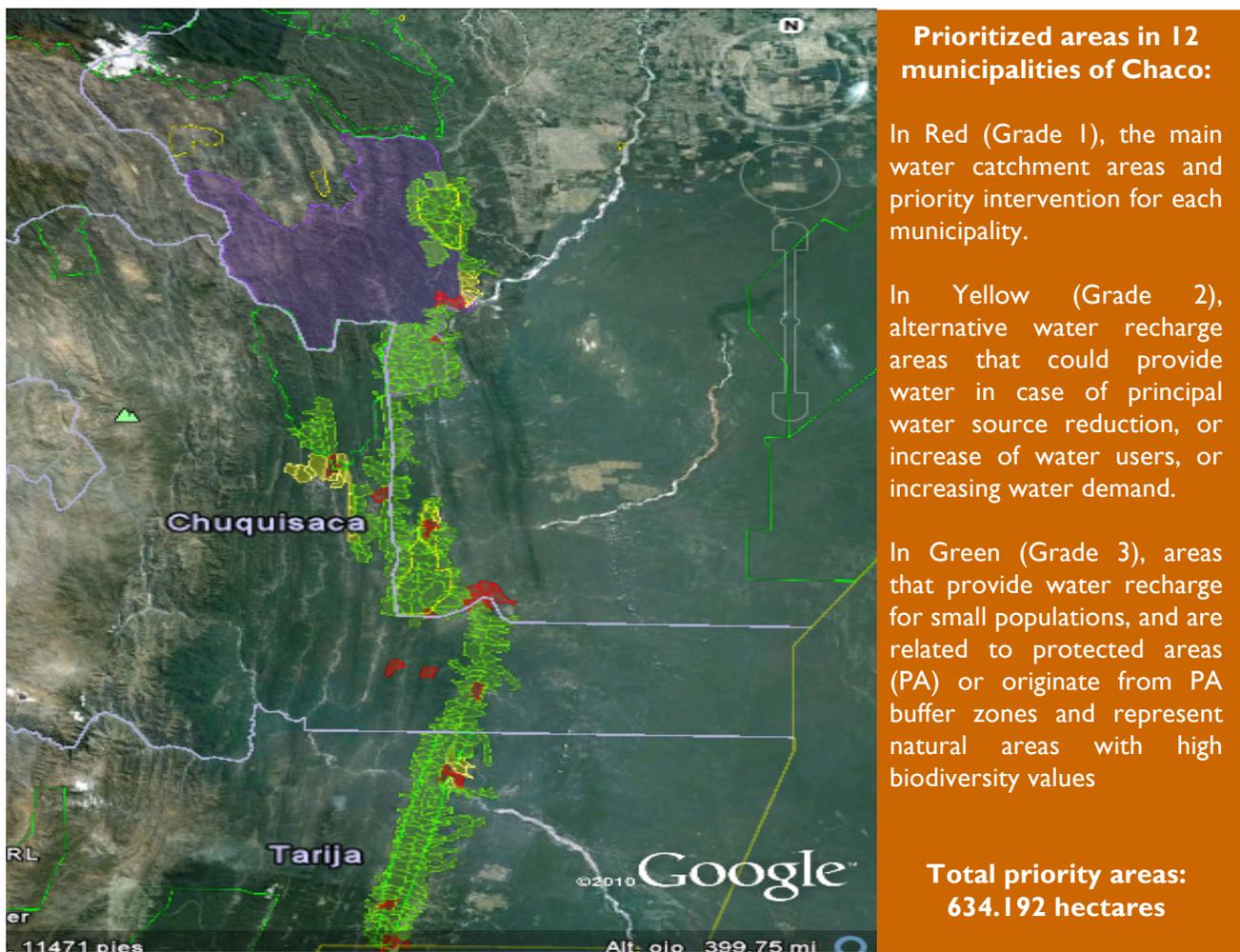
Once we had confirmed the willingness of local authorities to work together on the conservation of important water sources for the Chaco region, Natura used GPS to located municipal water intakes. Based on criteria developed by Robert Müller, ("Bolivian watershed prioritization for implementation of compensation schemes for environmental services"), we used the Geo-mode with Integrated Geographic Information System IDRISI (developed in the laboratories of Clark University), to identify areas of recharge and infiltration for each water intakes.

The IDRISI system uses satellite imagery information to digitally drop a "water drop" in each pixel and thus can identify stream pathways and aquifer recharge areas on a map. In this way, we identified three priority criteria in relation to the intervention areas and implement conservation actions of water sources:

Grade 1: Sources of direct water recharge for cities with medium-large populations.

Grade 2: Recharge areas that potentially serve as alternative refills for the Chaco population centers, and in some cases constitute recharge areas for smaller populations.

Grade 3: areas that provide water recharge for small populations, and are related to protected areas (PA) or originate from PA buffer zones and represent natural areas with high biodiversity values. Our goal is that these RWS schemes can build biodiversity corridors, which would link the unprotected spaces between national, departmental and municipal protected areas in the Chaco



Consolidate at least 6 water funds

In 2011 and 2012, Natura approached 12 municipalities in the Chaco region to create local funds, in order to ensure the stated objective of creating six local funds for the implementation of RWA.

By late 2012, the Chaco Project technical team signed 8 agreements to preserve water sources (Cabezas, Gutierrez, Cuevo, Boyuibe, Machareti, Villa Vaca Guzman, Monteagudo and Villa Montes).

The following table summarizes the total conservation agreements and local funds that have been signed, details the amount of resources allocated by each partner and the percentage of participation of Natura Bolivia.

Financial Commitments of Partners made in 2012				
	2013 Local Government commitment	EPSA 2013 Commitment	10 Year local commitment	Project Comitment
Cabezas	1437	1006	24430	10000
Gutierrez	2874	no EPSA	38740	10000
Boyuibe	1437	1000	24370	10000
Cuevo	1437	862	22990	10000
Monteagudo	10000	1000	110000	10000
Muyupampa	10000	1000	110000	10000
Machareti	10000	no EPSA	100000	10000
Villa Montes	10000	1000	110000	10000
Partners commitments made in 2012			540530	80000

To date, the contributions of Boyuibe and Cuevo Water Cooperatives are based on a fixed monthly contribution of Bs. 1 to 2 per member or user of water in their bills or receipts for services. These contributions will be negotiated so that in the near future a percentage will be applied according to the consumption of these families. On the other hand, Cabezas and Villa Vaca Guzmán Water Cooperatives provide the fund with fixed amounts budgeted in the general annual budget, the same way it is expected that these contributions will be based and depend on a percentage of the consumption.

Finally, the municipalities of Gutierrez and Machareti legally constituted Water Cooperatives, or the ability to make contributions or even manage local funds. Therefore, within the range of institutional strengthening project (IR. 2) and for a successful Annual Operative Plan 2013, we will include actions that will strengthen all EPSAs and / or Water Cooperatives of all municipalities,.

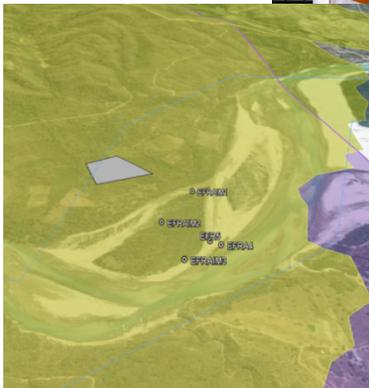
1.1 Environmental Local Fund of Cabezas (RWA)

At the end of 2011, the tripartite agreement was signed and the differentiated bank account opened for Abapó Water Cooperative. Supporting this institution was one of the most important activity conducted in 2012, for which we supported and facilitated the legalization of constitution documents, procedures for obtaining Tax Identification Number (NIT) and others.

Similarly, we worked closely with the water cooperative board of directors, the importance of continuing to work on implementing the contribution through the water bill, a percentage according to water consumption of users for the preservation of water resources. We also broadened the themes on the inclusion of RWA and gender issues in their statutes.

We also worked with Cabezas water cooperative and the Municipal Government to socialize the concept and campaign contributions to the Environmental Local Fund on schools, fairs and media. Initial commitments to the environmental local fund were established in the contract: \$1,000 from Natura Bolivia, 10,000 Bs contribution from the municipality, and initially \$1,000 from the cooperative.

Implementation of landowner was conservation of 9 located in whose source downstream.



The Community of Yumao is one of the poorest communities in Bolivia (National Institute of Statistics, 2001) and with one of the highest needs for a new water source. Villagers are mainly dedicated to fishing and the production of corn. They drink water directly from the Rio Grande. According to studies of Natura, the water used for human consumption in Yumao is not suitable for drinking (presence of fecal coliforms) and heavy metals.

the Cabezas local fund started in 2012. One compensated for the availability and hectares of forest in Itaguasuti, community upstream recharge areas (Priority level 1), benefits to Abapó community located

Additionally, and according to a local request, we initiated a process for the possible extension of the Parabanó Municipal Protected Area in the Municipality Cabezas bordering ANMI RG-VCC.

The expansion will be accompanied by an update of the PA management plan, and Natura will cover the cost of developing the plan with the agreement that the Municipality will deposit an equivalent amount of money into a new local fund for Parabanó.

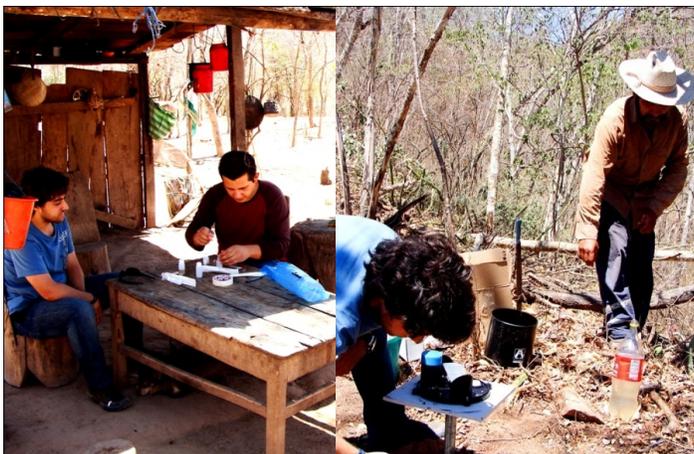
1.2 Environmental Local Fund of Gutiérrez (Reciprocal Tourism Agreements)

Natura's work in Gutiérrez began in 2011. In 2012 we formalized and signed the agreement between the municipality and Natura. Gutierrez has no water cooperative and the municipality distributes the water. We agreed that during the next two years the municipality will receive support of Natura and work to create a decentralized body which will be responsible for managing and implementing all matters related to water distribution in Gutiérrez. The aim of this local fund in Yumao community is

to consolidate a "Reciprocal Tourism Agreement" under a similar scheme to RWA, but with the difference that the ecosystem services provided are fishing and scenic beauty. Yumao has an important number of tourists and visitors who enjoy fishing. Tourists receive the ecosystem services and it is the community, through their actions, who can provide them. Our goal is to create a local fund that provides income to Yumao and help to enhance and improve the services offered. Our first task in 2013 will be to analyze the carrying capacity that the area can provide without affecting the environmental health (i.e. catch and release).

To start forest conservation actions, the community agreed to a compensation package composed of a drinking water source. For that, Yumao would protect the entire forest it has in its territory as a communal reserve (approx. 5000 hectares). With the support of Yacuiba water cooperative (EMAPYC) we identified and analyzed all possible sources of water for Yumao and agreed with the community about the most feasible and cost / effective water source in Tatarenda. Natura's legal department continues to support the activities in order to proceed with the initial compensation.

Natura's Department of Limnology conducted analysis of water quality and quantity for the existing well in the community of Rio Grande and a well in Tatarenda. With this information and the support of the hydrogeologist of the EPSA EMAPYC-Yacuiba, we developed a proposal for a providing a new water intake in 2013, that would act as compensation for the preservation of ~ 5,000 ha, once the issue of land ownership is solved with the support of the Legal Department of Natura.



1.3 Environmental Local Fund of Cuevo (RWA)

A tripartite agreement between the municipality, the water cooperative and Natura was signed in 2012, and the total amount of the environmental local fund is composed of a Bs. 2 monthly contribution for each member of the cooperative. The collection began in the month of July 2012 and more than 500 users contributed. The counterpart contribution is 10,000 Bs from the municipality of Cuevo and \$1,000 contribution from Natura Bolivia.

During 2012, efforts were made to legally strengthen the water cooperative, so they can have all the documents required to open a differentiated bank account for the local fund. Cuevo Water Cooperative still requires more support for this, and until now have used an existing private bank account number for Local Fund so that all the resources of the parties can make the payment. Also, we have organized workshops to present RWA to the Mandiyuti community, the main community living in upstream. This area has a great impact on the water recharge zone for the people living in

Cuevo. Mandiyuti is located mostly within the municipality of Cuevo. The RWA workshop was offered to the entire community, and described the importance of protecting the watershed that supplies water to the population of Cuevo. Moreover, the same watershed that supplies water to downstream Cuevo also contributes greatly to water recharge to the municipality of Boyuibe, further downstream, known as one of the municipalities with the highest water shortage.

A tripartite agreement between the Municipality of Boyuibe, the EPSA and Natura, was signed in 2012. The local fund is composed of the contribution of Boyuibe's EPSA through a monthly contribution of Bs. 1 by each partner since July 2012, Bs. 10,000 from the municipality of Boyuibe and a \$1,000 contribution from Natura.



Captains of the community of Mandiyuti (partly within the municipality of Cuevo and partly within the municipality of Huacaya), signed communal documents promising to conserve more than 1600 ha of forest that provides water to Cuevo, Huacaya and Boyuibe. The compensation will be made in 2013.

1.4 Environmental Local Fund of Boyuibe

In 2012, Natura focused its efforts to strengthen the local fund of Boyuibe, forming a board of directors, approving operational procedures and developing an implementation plan for the local fund. We also visited upstream communities to agree on the type of compensation they would receive for the preservation of forests that provide water to the population. Finally, we presented different proposals to the Social Manchaco EPSA to include gender issues and RWA in the statutes of association of municipalities that will affect the 6 municipalities that comprise it.

The Municipality of Boyuibe executed the local fund resources established under the agreement and the inputs that are in stock will be delivered to the communities of Pailón and Kuruyuki, in the area that recharges the wells of Pailón, the only source of water for Boyuibe. Compensation will be provided in 2013. In addition, we will support the creation of the association of municipalities between municipal governments of Boyuibe, Cuevo and Huacaya to ensure the conservation of shared water recharge. This initiative will be coordinated with the neighboring municipality of Machareti, which also shares the same water factories with Boyuibe.



Given that the recharge zones for Boyuibe are limited to two communities we are also planning to invest in activities that improve the efficiency of downstream water use. With support from Natura, Boyuibe municipality has made the first steps to implement a pilot project for water efficiency for cattle feeding. Copying experiments being undertaken to the north, in the municipality of Cotoca, from 2013 onwards we will pilot hydroponic silage production in Boyuibe.

Hydroponic silage in Cotoca, Santa Cruz.

I.5 Fondo Local ambiental de Monteagudo

In 2012 an agreement was completed between the municipality of Monteagudo and Natura, resulting in the signature of the tripartite agreement for the protection of 5 micro watersheds that will benefit more than 10 communities. It will constitute an alternative of water recharge zone for Monteagudo. At the end of 2012 the city contributed a total of Bs. 105,000 in cash and in kind, while the contribution of Natura was \$1,000.. Additionally we worked with the Zapallar Watershed Committee, the water cooperative, GIZ, SERNAP and other local actors to consolidate a functional institution and a specific fund for the Zapallar watershed.

Natura led the creation of the local fund, to support the protection of the Ñaño Protected Area, ensuring resources for hiring park guards to safeguard the important water catchment area for the municipality of Monteagudo. The tripartite local fund will also ensure resources for middle and upper basin communities living in the Zapallar watershed.

During 2013, we will begin the biophysical baseline in all intervention municipalities of Natura. In the case of Monteagudo, we will work jointly with the Zapallar Water Committee, San Francisco Xavier University, GIZ, Social Manchaco EPSA SAM - Monteagudo System, and the local communities

I.6 Environmental Local Fund of Villa Vaca Guzmán (Muyupampa)

The signature of the tripartite agreement was made with the participation of Natura, the Municipality of Villa Vaca Guzman and the Manchaco EPSA - Muyupampa System. A differentiated bank account was opened and the local fund has now a board of directors and approved regulations. The compensations will be made in 2013 to identified communities in the prioritized area. In 2012 we visited these communities and achieved consensus around the type of compensation that will be provided. As in all intervention municipalities of Natura in 2013 we will collect socioeconomic data to define a project baseline.

I.7 Environmental Local Fund of Macharetí

The Cuevo tripartite agreement was signed in September 2012. This document establishes the commitment of the municipality to deposit \$10,000 to the local fund. Natura will commit a total of \$1,000. Compensation will be made for the benefit of the population to preserve forests around at least 6 communities in Macharetí. Four (4) water sources will be protected, one of which is already in use and three (3) are under construction.

Additionally, Natura will support the municipality in the creation of a municipal water cooperative, since it currently has no cooperative able to provide an adequate service. Natura has also committed to support the municipality in the management and protection of a departmental protected area whose creation is in progress. Natura will implement RWA in surrounding communities ensuring the preservation of Macharetí water sources.

1.8 Fondo Local ambiental de Villa Montes RWA

Villa Montes is home of the headquarters of the Social Manchaco EPSA SAM, an umbrella institution that joins six companies providing water in Monteagudo and Villa Vaca Guzman in Chuquisaca department, Lagunillas, Boyuibe and Camirí in Santa Cruz department, and Villa Montes in Tarija department. In order to enhance our ability to work in these municipalities a framework agreement was signed in June 2012 with the Social Manchaco EPSA, in order to strengthen each of the tripartite agreements. In addition we developed a proposal to include the RWA concept and gender balance within the EPSA Manchaco statutes.

In addition, a tripartite agreement between the EPSA of Villa Montes, the municipality of Villa Montes and Natura, is closed to being signed. The City Council has published the resolution and supporting documents in accordance with law. The only remaining step is the official signing of the agreement, for which we are coordinating with the Mayor to organize a ceremonial event to be attended by media, and the Villamontes townspeople.



Additionally, we are working in the entire province of Chaco, Municipality of Macharetí, Chuquisaca coordinating with the Gran Chaco Autonomous Regional Assembly (Yacuiba, Villa Montes and Caraparí sections), to include RWA model into the Regional Statutes of the Gran Chaco and the Gran Chaco Regional Development Plan. Both proposals have been submitted to the Regional Assembly. In addition we worked with the three governments to initiate a Reciprocal Water Agreements model that contributes to the preservation of the water factory of Aguargue National Park.

1.9 Other local funds

Natura has also approached institutions managing water in four other municipalities, comprising Yacuiba and Caraparí (in Gran Chaco, Tarija), Huacaya (Chuquisaca) and Camirí (Santa Cruz).

2.0 Other activities

During 2012, we concluded a socio-economic baseline for the entire project intervention area. During this process we visited 91 communities in 11 municipalities in the Bolivian Chaco, asking more than

3,000 families 127 questions. We have started tabulation of the surveys and during 2013 we will complete the tabulation and deliver the results of the data collection process back to local authorities