



Darwin Initiative Main: Final Report

To be completed with reference to the “Project Reporting Information Note”:
(<https://www.darwininitiative.org.uk/resources/information-notes/>).

It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes.

Submission Deadline: no later than 3 months after agreed end date.

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Darwin Initiative Project Information

Project reference	DARNV006
Project title	Replenishing Bolivia's Water Footprint: Scaling Watershed Conservation through Public-Private Partnerships
Country(ies)	Bolivia
Lead Organisation	Natura Bolivia Foundation
Project partner(s)	Coca Cola Bolivia, (CEJIS) Center for Legal Studies and Social Research, Cuencas Sustentables Ltd.
Darwin Initiative grant value	£185,209
Start/end dates of project	April 1, 2022-Mar 31, 2024
Project Leader name	Nigel [REDACTED]
website/blog/social media	n/a
Report author(s) and date	Nigel [REDACTED] and Osvaldo [REDACTED] June 30 2024

1 Project Summary

The project's primary locations – Bolivia's Santa Cruz Valleys – are part of the tropical Andes biodiversity hotspot. Amboró National Park, the Valleys' northern border, hosts >900 bird species, almost 10% of the bird species on earth. Many rural communities in the Santa Cruz Valleys – as in much of the developing world – depend on streams and rivers for their water supplies. Livestock often defecate in these water sources and are major contributors to contamination and concomitant health problems, especially amongst children. Moreover, extensive cattle grazing is one of the primary threats to global biodiversity and forest cover. Cows enter riverine forests, to drink and graze. They disturb crush herbs and fungi, consume seedlings of endangered tree species, and disturb the habitat of small animals, thus severely reducing biodiversity. Cows also defecate and urinate in the streams and compact soil, leading to higher levels of faecal coliforms, increases in flooding and sedimentation, and decreases in dry season water flows and quality.

Over the last 20 years, Natura Bolivia has developed a conservation model, *Watershared* (Acuerdos Recíprocos por Agua), that is based on the logic that protecting upstream forests helps maintain water supplies, and that sustainable conservation requires the financial participation of water users. The basic *Watershared* model has been refined and improved, and now operates in 96 Bolivian municipalities (plus ~20 more across the Andes). In Bolivia, *Watershared* programs are protecting 600,000 hectares of forests, benefiting 35,000 upstream indigenous and rural families, and improving drinking water quality for almost 500,000

downstream users. Drinking water cooperatives and local governments provide upstream landowners with economic development projects, such as fruit trees, irrigation pipes and beehives, in exchange for forest conservation. Upstream landowners can thus move away from drought susceptible agriculture, and simultaneously improve hydrological functioning, ensuring water quality and quantity for human consumption.

The *Watershared* model is innovative, being based on behavioural- rather than neoclassical-economic theory (and is thus very different from Payments for Environmental Services, PES). However, although *Watershared* is functioning in more than 100 municipalities in four countries, it has two fundamental weaknesses, namely that it:

- Relies on philanthropic start up finance, with users only contributing significant funds after a few years.
- Focuses on conservation and ignores all other water management issues such as the building of dams, pipelines and distribution and purification systems.

Even though Bolivian municipalities invest significant sums in water access projects, there is currently no financial or legal mechanism through which they can simultaneously invest in upstream conservation. Such “access only” water systems are thus destined to provide users with drinking water that is legally unfit for human consumption. On the other hand, philanthropic investment in biodiversity conservation is decreasing, and once local communities realize that their water supplies are contaminated, it is often too late to inexpensively resolve the problem.

This project was designed to evaluate how to resolve these weaknesses and to develop a minimum viable product that: 1) links conservation (the securing of green infrastructure) with the building of pipes, dams, taps etc. (grey infrastructure), 2) achieves both simultaneously at low cost and 3) demonstrates a road map to get local authorities to pay for these linked green-grey infrastructure systems.

The project’s innovation was thus to determine a legal pathway by which the public funds being invested in water access projects could also be used to undertake upstream conservation. Such a mechanism would allow governments to simultaneously guarantee clean water supplies and to protect the biodiversity of some of the world’s most biodiverse forest, in a more efficient and effective way than trying to achieve these goals separately.

Over the two years of the project, we successfully designed and piloted in seven municipalities this innovative financing model for integrated water access and conservation, putting 4,574 hectares under conservation agreements, which translates as ~ 3,348,168 tCO₂e (4,574 ha * 200 tC per ha *3.66).

According to calculations undertaken by Conrado Tobon, ecohydrologist at the University National of Colombia (Medellin), one hectare of forest in the project area provided adds extra 700 m³ to streamflow in the dry season so 4,574 hectares under conservation adds 3,201,800 m³ to the ecosystem. The projects have provided more secure water supplies to (and hence have improved the resilience of) 2,256 downstream families and has provided development projects to 213 families as compensations for their conservation activities.

The project achieved all its outcomes, implementing 7 (rather than 3) integrated green-grey systems. We also believe that we are on our way to transformational change given that we have three more projects being implemented, three more in the feasibility stage, and five more in the pipeline.

The next phase, post-Darwin is replication, standardization and roll-out. The 96 municipal governments across Bolivia that implemented previous iterations of *Watershared* are potential implementers of the green/grey financing innovation that this project has pioneered. We are currently in the process of negotiating a \$280,000 loan from the Interamerican Development Bank (IDB) (<https://www.iadb.org/en/news/two-innovative-solutions-win-challenge-tackle-water-and-sanitation-needs-latin-america>). IDB economists are helping us make the model self-sustainable.

2 Project Partnerships

This project has seen the relationship between three of the partners go from strength to strength. Our relationship with the fourth partner, CEJIS, remains strong, but it has not prospered with the context of the project per se.

Cuencas Sustentables was formed in 2019 to learn lessons from Natura's water management experiences and make them financially sustainable. The relationship between Natura and Cuencas is thus very strong, and there is continual mutual learning. For this project, the division of labour was essentially that we used Darwin support to fund Natura staff to think through how to design the project, then used Cuencas Staff and co-financing to actually implement the pilots. The Natura–Cuencas relationship is thus strong (including co-writing this report), mutually beneficial and will continue post-project.

Coca Cola provided constant advice and support and is co-financing other of Natura's activities across the Santa Cruz valleys landscape, and Natura and Coca Cola are negotiating a new proposal to continue the project's work.

In contrast, the partnership with CEJIS did not prosper in the project. We had expected strong legal support from CEJIS (whose full name translates as the Center for Legal Studies and Social Research) because CEJIS had played a major role in the precursor to this project, a one-off experiment to build a grey-green water infrastructure system in the municipality of Lomerio. While CEJIS interest was to continue work in Lomerio rather than pilot the project concept elsewhere, Natura and Cuencas are currently developing plans to start a new project with CEJIS in another municipality, Charagua. We expect that our learning from the Darwin project will contribute to this new initiative.

The former British Ambassador to Bolivia, Jeff Glekin, visited Natura Bolivia offices at the end of March 2023, and we briefed him on the project, and we later took him to visit a series of similar projects (the actual project sites were too far away for him to visit in his short trip). In April 2024 we met with the new British Ambassador to Bolivia, Richard Porter, to discuss project results.

3 Project Achievements

3.1 Outputs

In year 1, we advanced on Output 1:

The technical, legal, and financial pathway to implement a green/grey infrastructure public private partnership model for water access and sustainable watershed management is designed.

With the indicators:

1.1. The financial and technical model is designed, and its logic and implementation feasibility confirmed by municipal technicians (by September 2022)

1.2. The legal pathway for municipal investment in watershed conservation is designed and verified (by September 2022)

1.3. Three municipalities commit to investing in pilot green/grey infrastructure projects (by March 2023)

All three indicators were completed as expected, and activities undertaken as programmed.

1.1.1. Analyse literature to evaluate previous similar experiences in other fields.

1.1.2. Meet with 20 municipal authorities and technicians to discuss concept/analyse options.

1.1.3. Design draft model, share with partners and refine based on feedback.

1.1.4. Finalize model and present to municipal collaborators for approval.

1.2.1. Analyse legal precedents to identify options.

1.2.2. Meet with 10 municipal lawyers to discuss concepts and analyse options.

- 1.2.3. *Design draft of proposed legal pathways, share with partner lawyers and refine.*
- 1.2.4. *Finalize model and present to municipal lawyers for approval.*

These activities were undertaken in a series of one-on-one meetings with municipal authorities and technicians and finalized in a 4-day workshop that discussed the details of the new “innovation” version of the Watershed model. This event was co-funded by the Nordic Climate Facility and the Darwin Innovation project. Workshop participants comprised 45 water experts, and municipal technicians from eight countries, including staff from project partners and water professionals from Colombia, Ecuador, Peru and Chile and from across Bolivia.

From October-March we then visited individual municipalities of El Trigo, Villa Serrano, Comarapa, Saipina, Tomina, Pampagrande, San Ignacio de Velasco, Vallegrande, Samaipata and Quirusillas to:

- 1.3.1. *Analyse municipal documents and land use maps to identify potential communities.*
- 1.3.2. *Discuss potential sites with municipal leaders and community members.*
- 1.3.3. *Develop concept proposals for green/grey infrastructure in 10 communities and discuss.*
- 1.3.4. *Select sites with greatest potential and finalize project design.*
- 1.3.5. *Submit proposals into annual municipal budgeting process.*
- 1.3.6. *Work with municipal technicians to ensure acceptance of proposals in municipal budgets.*

In terms of Output 1 indicators:

1.1. The financial and technical model is designed, and its logic and implementation feasibility confirmed by municipal technicians (by September 2022, baseline, 0 approved models). After initial analyses we concluded that the only way to efficiently assess logic and implementation feasibility was to undertake two real-life designs. We therefore worked with municipal technicians to undertake cost analysis for two municipalities, Tomina and El Trigo. The cost of repair and expansion of the potable water system of the Fuerte Rúa community in Tomina, was calculated to be £6,705, while improvement of the water system from the water intake to the installation of two storage tanks in El Trigo would cost £25,228. Built into the costs of these projects was the conservation of 377 ha and 870 ha respectively. Both municipal governments confirmed that such projects were feasible and initiated a search for financing.

By the end of Year 1 we had successfully designed the financial and technical model, as evidenced through three municipal governments (Quirusillas, Tomina and Trigo) approving and signing contracts (*Folder Output 1.1 Design of financial and technical model*). These first contracts stipulate the legal justification, the legal process, and the financial details (and we have also added one financial analysis from Tomina, as an excel file)

1.2. The legal pathway for municipal investment in watershed conservation is designed and verified (by September 2022, baseline, 0 approved legal pathways). Project lead Liset Menacho worked with lawyers from Tomina and El Trigo to ascertain that, with community support, there was a legal pathway to using national government funds to finance the projects. We then worked with a constitutional lawyer to iteratively develop templates of legal contracts that would facilitate municipal financing. The attachments in the *Folder Output 1.2 Legal document describing governmental options* include a template for another financing option that the lawyer developed designed for larger jurisdictions, and the signed contracts themselves show the legal model that seems to work best,

1.3. Three municipalities commit to investing in pilot green/grey infrastructure projects (by March 2023, baseline, 0 municipal investments): We continued to engage with advancing the projects in the municipalities of Tomina and El Trigo. Other municipalities also committed to invest in the initiative, so that after the three-municipality trial, the project facilitated the full commitment of four additional municipalities (Pasorapa, Villa Serrano, Moro Moro and San Rafael (Sapoco)). Three of these letters of approval contracts are attached in Annex 1 (*Folder “Output 1.3 Municipal decrees approving investments*).

In Year 2 we completed activities

- 1.4.1. *Publish and distribute lessons-learned document*
- 1.4.2. *Organize meetings and workshops to present findings to municipal leaders*
- 2.1.1. *Build grey infrastructure systems (pipes, dams, tanks, chlorinators/purifiers etc.)*
- 2.1.2. *Deliver functioning water access system to community members and municipal officials,*
- 2.1.3. *Municipal governments reimburse project for funds expended in construction.*
- 2.2.1. *Hold meetings to discuss new community-based maintenance tariffs*
- 2.2.2. *Community members organize implement new tariff system.*
- 2.3.1. *Identify community members and train them in system management and monitoring,*
- 2.3.2. *Community members manage chlorination systems*
- 2.3.3. *Chlorine tablets are replaced on schedule and system is maintained.*
- 3.1.1. *Present and discuss watershed conservation agreement model*
- 3.1.2. *Negotiate compensation packages, and draft*
- 3.1.3. *Sign conservation agreements and deliver compensation packages*
- 3.2.1. *Community members walk transects within the conservation area and report incursions*
- 3.2.2. *Define penalties for infractions, notify and sanction infractors, and repair*

Completion of these activities allowed us to advance on outputs 2 and 3 namely:

Output 2. A green/grey infrastructure public-private partnership model for water access and sustainable watershed management is financed by municipal governments and tested by local stakeholders.

Output 3. Local communities manage their water supplies sustainability and conserve their forests

In terms of Output 2 and 3 indicators:

Output indicator 2.1. Three water access systems (the grey infrastructure of tanks, dams, pipes etc.) are built (by December 2023, baseline, 0 systems). The Folder “*Output 2.1. Receipts of delivery of water access system*” includes delivery proof from Villa Serrano, Moro Moro and San Rafael municipalities, plus selected photos of the delivered grey infrastructure. These documents show that three water access systems were built and were delivered to and accepted by the Municipal Governments.

Output indicator 2.2. Three communities implement a new user tariff to cover maintenance costs of the water distribution system and watershed conservation (by July 2024, baseline, 0 tariffs). All seven communities have committed a repayment schedule based on new tariffs charged to the water users. We have attached these for the municipalities of El Trigal and Villa Serrano in Folder “*Output 2.2. Statutes of new tariff rules, bank statements*”. See the file ACCELERATOR PROJECTS DARWIN in the Folder *Publicity and publications and project summary* to list the current repayment status of each municipality. Of the \$317,247 of counterpart funds we have spent on the grey-green infrastructure during the project lifetime, \$146,813 (46%) has been repaid.

Output indicator 2.3. Water systems are managed sustainably by three newly created community-based water management institutions (3 institutions created by March 2024, baseline, 0 systems managed, 0 institutions trained) We built the institutional frameworks (or are in the process of building them) to allow community members to manage and maintain their new water systems, as evidenced in Folder *Output 2.3. “Articles of incorporation of new community-based institutions”*

Output indicator 3.1. 4000 hectares of watershed forests are protected from agriculture and cattle through fencing and/or compensation payments to owners (by December 2023, baseline, 0 hectares.) The total area of land put under conservation agreements in Quirusillas, Tomina, Trigal, Villa Serrano, Moro Moro, Pasorapa and San Rafael sums to 4,574

hectares. *Folder Output 3.1. Signed conservation agreements* includes a selection of agreements signed by upstream landowners in Villa Serrano, Moro Moro and Trigal.

Output indicator 3.2. Protected forests are patrolled monthly to ensure compliance and, if necessary, non-compliance is sanctioned and restorative measures applied (2 patrols per month, 100 beneficiary families of which 200 beneficiaries are female, by March 2024, baseline, 0 patrols, 0 families with clean water) Folder “*Output 3.2. Patrolling reports*” includes monitoring reports from Villa Serrano and Moro Moro. Compliance has been generally high, but some landowners clearly did not fully understand their commitments. For example, of the 11 landowners in Villa Serrano, nine complied fully with their agreements, while one had opened an access road to part of his land, and one had cut a part of his forest. We are in the process of sanctioning these non-compliances, but using the logic that we start with short-term tolerance to build long term trust, and hence sustainable conservation.

3.2 Outcome

As part of the Popular Participation Law, Bolivian communities annually receive government funds (via municipal governments) according to their population size. Many communities use their money to build/improve their drinking water systems. There is thus a guaranteed annual cash flow available from central government to build grey infrastructure (i.e. dams and pipes) across Bolivia. However, each community must spend its budget annually, so the design of each drinking water system is based on annual budgets rather than hydrological or social needs.

This project’s innovation is to allow communities to install their new water systems and pay for them over time. This will:

- 1) Allow construction of appropriate (i.e. bigger and better) grey infrastructure systems than what is feasible with annual budget constraints
- 2) Incorporate training to strengthen community capacity for system maintenance
- 3) Simultaneously finance the conservation of forests and watersheds thus integrating grey and green infrastructure from project initiation.

We have fully achieved our project outcome: i.e., **An innovative, self-financing water access model, integrating grey and green infrastructure, is piloted by local municipalities, conserving 4000 hectares of forest, and replenishing 2 million m³ of water annually.**

Our indicators were:

0.1. Three example of an integrated grey/green infrastructure water access/watershed conservation model are designed, built, financed, and maintained by municipal governments and private sector water users (KPI 1: Extent to which intervention is likely to lead to Transformational Change (1 potentially transformational change by March 2024)

The project achieved these indicators, implementing 8 (rather than 3) integrated green-grey systems. We also believe that we are on our way to transformational change given that we have three more projects being implemented, three more in the feasibility stage, and five more in the pipeline. We are also in the process of negotiating a \$280,000 loan from the Interamerican Development Bank (IDB) (<https://www.iadb.org/en/news/two-innovative-solutions-win-challenge-tackle-water-and-sanitation-needs-latin-america>). IDB economists are helping us make the model self-sustainable

0.2. 4000 hectares of forest are conserved, 2 million m³ of water are restored to the ecosystem, and 300 families have access to clean water (KPI 1: Number of people whose resilience has been improved (1200 people by March 2024); KPI 2 net change in greenhouse gas emissions (tCO₂e) (3.6 million tCO₂e stored by March 2024), KPI 3 Number of hectares where deforestation has been avoided (4000 hectares by March 2024)

We have put 4,574 hectares under conservation agreements (*Folder Output 3.1. Signed conservation agreements*) based on contracts signed with seven municipalities (*Folder Output 1.1 Design of financial and technical model* and *Folder "Output 1.3 Municipal decrees approving investments*). 4,574 hectares under conservation translates as to be ~ 3,348,168 tCO₂e (4,574 ha * 200 tC per ha * 3.66). According to calculations undertaken by Conrado Tobon, ecohydrologist at the University National of Colombia (Medellin), one hectare of forest in the project area provided adds extra 700 m³ to streamflow in the dry season. 4,574 hectares under conservation thus adds 3,201,800 m³ to the ecosystem.

See file ACCELERATOR PROJECTS DARWIN in the Folder *Publicity and publications and project summary* for full details.

The seven projects we have implemented have provided more secure water supplies to 2,256 downstream families and has provided development projects to 213 families as compensation for their conservation activities. With more secure water supplies the 2,256 downstream families are more resilient to climate changes induced droughts, while the 213 upstream families have diversified and expanded their income sources through the implementation of development projects such as beekeeping and irrigation improvements.

We have also attached in the folder *Publicity and publications and project summary* is a World Bank publication that discusses project results and impact.

3.3 Monitoring of assumptions

Outcome and Output level assumptions were monitored throughout the course of the project, but we did not need and change in assumptions.

Outcome level assumption: We assume that municipal governments and private sector water users have sufficient financing to develop grey/green infrastructure projects. We also assume that communities are willing and able to conserve their forests, and that there is a link between forest conservation and water quality.

Output 1 Assumption: The fundamental assumptions underlying output 1 are that 1) we can integrate grey and green infrastructure into one single project 2) an integrated project will be only marginally more expensive than a standard grey infrastructure project, and 3) we can convince municipal governments to pay for such integration.

Our expected Pathway to Change was, and still is, that:

- 1) All Bolivian communities have annual budgets (~\$40,000 for communities of 50-100 families) as part of the Popular Participation Law.
- 2) Many communities build potable water systems.
- 3) Budgets are annual, meaning that systems built by construction companies are often too small, do not incorporate watershed management or training in maintenance, and hence quickly break down or malfunction.
- 4) Our pre-Darwin pilots showed that as a social business utilizing community labor, we can construct grey/green systems for 50-100 families, include training, and build in sustainability (including gender inclusiveness) for ~\$40,000.
- 5) The seven projects we have developed with Darwin Innovation Funding have clearly showed that there is a legal pathway to construct the systems with external capital, and then receive re-payment from municipalities.
- 6) Thus, for the same price as a private sector built grey infrastructure system, we can build integrated green/grey systems that are socially, economically, and financially sustainable; receive repayment from the municipality, and reinvest the funds.

3.4 Impact

Diarrheal diseases account for 1 in 9 child deaths, making diarrhoea the second leading cause of death among children under five. Extensive cattle grazing is the primary threat to water quality across Latin America. Cows enter riverbank forests to drink and graze, then defecate in streams, and compact soil. Faecal coliform loads increase, and water quality declines. Because many rural communities depend on such streams for their drinking water, forest degradation is a major contributor to gastro-intestinal disease. A meta-analysis of 300,000 children from 35 countries shows that higher tree cover upstream reduces the probability of diarrhoea.

Prior to the Darwin projects, using funds from the Government of South Korea we linked the construction of green- and grey- infrastructure in five communities at an average cost of \$30,000 per community. 464 families in the villages of María del Rosario, Santiago de Chiquitos, Yororobá, Quitunuquiña and La Asunta put 4,118 hectares of their forests into conservation, and each family now has clean water piped into their houses.

This water management model is based on the twin pillars that protecting upstream forests helps maintain potable water supplies, and that water users and local authorities need to contribute to such conservation. The innovation of this project – its real impact – was to chart a legal and financial pathway to help resolve two market failures:

- 1) Investment in water source protection—building dams and pipes, strengthening institutional capacity, etc.—must be upfront, while water benefits are delayed by 12-24 months.
- 2) The “grey infrastructure” required to efficiently access potable water is rival and excludable, but the “green infrastructure” (i.e. forests) that capture rainwater is often public.

The impact to which we expect to contribute is that “Bolivian water users achieve water neutrality (100% replenish) through upstream forest conservation.

“Business as usual” for water access projects across the Andes is that investments are made in grey infrastructure without any concern for upstream watershed management. Pipes quickly clog, dams fill with sediment, and drinking water is contaminated with faecal coliforms. Meanwhile, “Business as usual” for environmentalists is to invest donor funds and new water user tariffs to try to recover the situation through upstream restoration.

Our objective is a new “business as usual”, which a priori melds the civil engineering of grey infrastructure with the protection, maintenance, (and if necessary, restoration) of existing green infrastructure. Such integration will happen before the grey infrastructure is built to 1) ensure that upstream degradation does not prejudice the new investment and 2) “piggyback” the costs of the inexpensive green infrastructure protection onto the far more expensive grey infrastructure construction costs.

Given that thousands of rural Bolivian communities lack access to potable water and that protected forested watersheds can help clean water at low cost, we expect that the model will spread rapidly. Natura already works in more than 90 municipalities across Bolivia, and so we have direct access to hundreds of decision makers and thousands of communities where the new model could function.

The major barrier to scaling this model is that it has never yet been used. It is new and is requiring a change in thinking for both community members and municipal governments.

However, given that we have now implemented 8 integrated green-grey systems with Darwin Funds (plus the five pre-Darwin pilots), we believe that we are on our way to large scale impact. We are also in the process of negotiating a \$280,000 loan from the Interamerican Development Bank (IDB), where a team of four economists are helping us make the model self-sustainable, and we expect that this loan will be matched by a similar loan from Coca Cola.

4 Contribution to Darwin Initiative Programme Objectives

4.1 Project support to the Conventions, Treaties or Agreements

Bolivia's NBSAPs under the CBD are outlined in the 2019-2030 National Biodiversity Strategy. This project has helped achieve the following within Strategic Line 3: "Maintenance of environmental functions and Living Well in harmony with Mother Earth, by promoting regional, sub-national and local actions for the conservation of ecosystems and species of flora and fauna with a certain degree of threat and in the Transversal Lines: "contributing to ecosystem-based adaptation as a strategy for socio-ecological resilience to climate change in life systems" and "Adjusting regulations, programs, projects and actions to gender equality to ensure the equitable participation of women in Integral Management and Sustainable Biodiversity"

As part of its NDCs under the UNFCCC Bolivia expects to achieve a series of objectives in mitigation and adaptation by 2030. In terms of water, the project will specifically help "increase in a holistic manner the adaptation capacity and systematically reduce the hydric vulnerability in the country" and provide a "Significant improvement of social participation for local water management" and "Increase food production under irrigation.

In terms of forests the project will "increase the capacity of joint adaptation and mitigation through the comprehensive and sustainable management of forests" by "increasing forest areas with integrated and sustainable community management approaches" and "strengthening environmental functions (carbon capture and storage, organic matter, and soil fertility, biodiversity conservation and water availability)".

Natura has a formal cooperation agreement with the Bolivian governments "Mother Earth Authority" which commits Natura to provide "Technical and coordination support for the preparation of Bolivia's Nationally Determined Contributions", specifically through the "Technical, logistical and coordination support for the assignment of three municipalities to the Joint Mechanism for Adaption and Mitigation".

As part of the project, we had a series of meetings with the Mother Earth Authority, both in La Paz and in visits to our field sites.

4.2 Project support for multidimensional poverty reduction

The primary beneficiaries of the project are the 213 upstream beneficiary families of the Chiquitania and Santa Cruz valleys (half of the beneficiaries are female) who now have cleaner water and have receive development projects worth \$23,563. More than 2,250 downstream families are now benefiting from improved access to clean water. Females have benefited disproportionately from reductions in their daily burden of water collection. Children under five will also benefit disproportionately, as it is they who suffer the most gastro-intestinal diseases from polluted water.

Our beneficiary population were rural indigenous (Chiquitano) and peasant families in eastern Bolivia. These indigenous families live at the margins of Bolivian society practicing small-scale farming of maize, peanuts, beans, potatoes, squash, and yucca, with annual incomes of less than \$2,000. They also have the power to decide if and how watershed protection will take place or not, given that they deforest about 1.5 ha per family per year. Recognizing that indigenous women are often especially marginalized we will also focus on increasing gender equality. A transversal objective was that female-led households develop a new culture of sustainable watershed management: by project-end 30 women had ascended to community decision-making positions by building their capacities in leadership, health, and watershed management. The project has also helped build climate resilience, by ensuring that local community members have secure access to clean potable water from their own forests.

In the long term, the potential beneficiaries of our new model for the financing of water provision and conservation systems will be the hundreds of thousands of families in rural Bolivia who have no access to clean water. Our new financing model will ensure that when access to water is provided by their municipal government, it will contain less faecal coliforms because of the healthier upstream ecosystem.

Our poverty reduction theory of change is that:

- 1) Lack of water in quantity and quality has negative impacts on community well-being especially the well-being of young children, who suffer disproportionately from gastrointestinal diseases from polluted water and women who must spend excess time collecting and carrying water.
- 2) Enhancing water access will improve well-being, especially of women and children
- 3) Forest conservation has an opportunity cost for landowners, so this opportunity cost must be at least partially covered to maintain well-being
- 4) Carefully selection of compensation project types, to focus on income diversification and climate resilience (e.g. projects such as beekeeping and improvements in irrigation) can have a disproportionately positive effect on poverty reduction.
- 5) By co-designing projects with local communities and helping them think through how best to use the funds that have been authorized to their community by the Popular Participation Law will maximize the probability that community members will be able to engage with the new water infrastructure.

4.3 Gender Equality and Social Inclusion (GESI)

Please quantify the proportion of women on the Project Board.	We don't have a project board
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women.	50% of project partners are led by women, Natura has a senior leadership team consisting of at least 50% women

GESI Scale	Description	Put X where you think your project is on the scale
Sensitive	The GESI context has been considered and project activities take this into account in their design and implementation. The project addresses basic needs and vulnerabilities of women and marginalised groups and the project will not contribute to or create further inequalities.	X

In the often-male dominated culture of Bolivia, women's and especially girl's voices are rarely heard. Many women own land in Bolivia's Santa Cruz valleys but are unable to use it effectively. Traditional development projects that focus on improving crop yields and productivity invariably benefit men. Our project has been different. Women are most usually responsible for collecting and managing household water supplies. By enhancing water access, we will immediately improve the living standards of many women.

Secondly, in exchange for conservation commitments, we provide economic development projects to more than 200 upstream families. We prioritized types of compensation that benefit women, such as beehives and other tools for honey production and prioritized signing agreements with females. For example, four of the 10 conservation agreements signed in Villa Serrano were with women.

Of our eight core team members, four were female. We recognize that this will not promote gender equality, but it is an internal policy of Natura, that whenever possible, females make up most team members. To increase the chance of gender equity, a woman (Maria Teresa Vargas) was responsible for project evaluation and was specifically charged with ensuring that gender issues are considered.

4.4 Transfer of knowledge

We have held a series of meetings at the local, departmental and national level to transfer knowledge and project learning to practitioners or policy makers to apply this thinking to practical conservation challenges. This is primarily through personal meetings and workshops as we try to build the network of project experimental sites.

4.5 Capacity building

We have not focused on building the capacity of staff

5 Monitoring and evaluation

Our “Innovation” project has not been standard in the sense that we have not had a series of detailed sub-activities and activities that we expected and needed to monitor and evaluate. Indeed, the nature of our innovation is that we did not expect that all individual activities would go as planned, nor that we necessarily needed to complete them all as planned.

Thus, for example, while we had expected that Activities 1.1.1. to 1.2.4 would be undertaken primarily in a series of one-on-one meetings with municipal authorities and technicians, we quickly realized that it would be more efficient to do so in a group. We therefore finalized them in unexpected fashion, in a 4-day workshop that discussed the details of the potential innovation. Similarly, after an initial analysis we concluded that – rather than undertaking the expected desk studies – the only way to efficiently assess logic and implementation feasibility was to undertake two real-life designs. We do not view such changes and the M&E challenges that go along with them as problematic. Rather they are the nature of an innovation project.

Rather than monitoring and evaluating activities, we focused on the outcome, the three outputs and their indicators

All were completed as planned, as were all the activities, or slight variations thereof and there were no major changes in the project design. Our M&E system was indeed practical and helpful to partners and stakeholders.

During the project, staff helped two World Bank consultants undertake an evaluation of natura’s work in general and this specific project. The key findings of this evaluation “Leveraging Citizen Action for Water Conservation (<https://documentos.bancomundial.org/es/publication/documents-reports/documentdetail/099417306192332086/idu06658fbc60f1620466d0b1830ec00fc674340>) were that:

- Combining the dual objective of conservation and development goals allows nature and economic needs to be addressed in unison.
- In-kind incentives promote the generation of sustainable livelihoods.
- Upstream communities participate because of a suite of economic and noneconomic motivations, including financial incentives, individuals’ social capital, and community social norms.
- Because most of the costs of Watershared are paid by local governments and water users, the program does not depend on external funding and is sustainable.

6 Lessons learnt

Lesson learning and scale-up of the basic *Watershared* model – conservation of water sources (“green” infrastructure) – is well under way across the Andes, building on 20 years of experience of Natura Bolivia, the Corporación Valle de Cauca (CVC) (Colombia) and hundreds of municipal water providers, from Yacuiba on Bolivia’s border with Argentina, to Oxapampa in Central Peru, and San Vicente de Chucuri in northern Colombia. The conservation component of *Watershared* has thus been improved, refined, and adapted in each of these local contexts and is currently being piloted in Kenya and Comoros. The municipalities and water providers that are already investing in the conservation of their water sources – some of which have partnered with us for almost 20 years – will likely be the first implementers of the new green/grey iteration that we have piloted in this Darwin project

Post-Darwin financing we will partially transfer implementation to municipal authorities, and increasingly play the role of facilitator, catalyst, and financer rather than implementer. Evidence to date suggests that *Watershared* is exponentially scalable in terms of both need and available finance. The primary constraint to scalability is the ability of Cuencas and Natura to work at scale. This is a human resource constraint, and we recognize that we will need to find new partners with scaling experience as we advance with the next phase of the program to be funded by the InterAmerican Development Bank.

What worked well, and what didn’t work well? Our iterative, experimental approach worked very well as we tried to chart a pathway in the labyrinth of municipal laws, regulations and procedures. What didn’t work as well was when our innovative searching bumped up against municipal government bureaucracy. In terms of project outputs, levels of compliance with the conservation agreements are not as high as we would have expected, and so we are trying to understand why that should be and what we can do about it.

If you had to do it again, what would you do differently? We struggle, as an institution with our own bureaucratic inertia. Decisions often take longer than they need to take, and we are (slowly) developing processes to help us be quicker and nimbler.

What recommendations would you make to others doing similar projects, for example tackling the same issues or working in the same geographical area? Experiment, experiment, experiment! Conservation can profitably learn from other sectors, such as start-ups, which aim to pilot, quickly collect data and “fail fast”. Failure in conservation needs to be better rewarded, but only when implementing organizations innovate and quickly learn from their mistakes, and change course or pivot based on the data they have collected. This has been the philosophy of our innovation project.

What key lessons have been learnt as a result of this project? (including administrative, management, technical, M&E). We believe that Darwin could usefully rethink reporting requirements for Innovation projects. Innovation projects, by definition, do not necessarily go as planned! Activities, outputs and outcomes may change, but reporting requirements and sections seem to closely resemble those of more traditional Darwin projects. Reporting on an innovation, within the same reporting format as a standard project, is somewhat constraining, and we have often found ourselves somewhat at a loss of what to write.

7 Actions taken in response to Annual Report reviews

Our interpretation of the review of our last Annual report was that the reviewer was somewhat frustrated by the lack of detail in our description of our processes, and our trials and tribulations of iteratively zig zagging to an outcome, and the fact that it was often unclear in our writing if and how we were going to achieve our outcomes and impact.

For example, the reviewer noted:

“.. the AR ... lacks detail on how the project has gathered information and moved through its workplan. Whilst we do not expect all of the information collected to be reported in the AR, we do expect some insight on key information points and evidence of how they have led to decisions/actions that contribute towards delivering against the logframe. In subsequent ARs, it should be clearer what information the project team have gathered, what the outcomes of activities were, and clearer evidence should be provided regarding their completion”.

“there is little evidence of baseline data collection and little narrative detail given to support the assertion that the project is on track to deliver its Outcome”.

“... there are serious issues with the AR regarding the lack of detail given about project activities This makes it hard to say with confidence whether the project ... has delivered as expected....”

These points are well taken. However, having reflected on these comments, we are still rather confused about what level of details were required, why such details are needed, and the value (and indeed the possibility) of providing them in “mid-stream” of an innovation project.

As we understood it, the whole idea of an innovation project is that it runs an elevated risk of not achieving its outcomes, and even some of its outputs – but that this would be acceptable.

In a trial-and-error experiment, it is very difficult mid-stream to provide “*some insight on key information points and evidence of how they have led to decisions/actions that contribute towards delivering.*” To be honest, we really don’t know how we were able to navigate one route but not another, and we really couldn’t, even now, provide useful *baseline data ... and ... narrative detail* about why, after year 1, we were able to “*assert ... that the project is on track to deliver its Outcome*”.

But at the end of year 2, we have achieved what we set out to achieve and more. We are still not sure, either after year 1 or now, why this has worked. We were just confident that an experimental innovation would allow us to test and refine our new Watershared model.

Finally, the reviewer felt that:

“there is little information on if the new grey-green infrastructure will provide the water neutrality targeted in the impact statement or how this could be measured. Secondly, there is no target on the number of water users targeted by the project, nor clarity on how the number of users impacted will be measured.

...there needs to be clearer evidence of how the project intends to monitor its impact...

We are not sure what this comment is referring to. Agreed that things were unclear with only one of our three outputs completed, but as noted above:

Over the two years of the project, we successfully designed and piloted in seven municipalities this innovative financing model for integrated water access and conservation, putting 4,574 hectares under conservation agreements, which translates as ~ 3,348,168 tCO₂e (4,574 ha * 200 tC per ha *3.66) sequestered.

Conrado Tobon (University National of Colombia (Medellin)), has calculated that one hectare of forest in the project area provided adds extra 700 m³ to streamflow in the dry season so, our 4,574 hectares under conservation adds 3,201,800 m³ to the ecosystem.

The seven projects have provided more secure water supplies to (and hence have improved the resilience of) 2,256 downstream families and have provided development projects to 213 families as compensations for their conservation activities.

We have thus achieved all our outcomes, implementing 7 (rather than 3) integrated green-grey systems. We are on our way to transformational change given that we have three more projects being implemented, three more in the feasibility stage, and five more in the pipeline likely to be funded by a \$280,000 InterAmerican Development Bank loan.

8 Sustainability and Legacy

In 2019 Natura, Cuencas and CEJIS implemented a project in La Asunta community that build the grey infrastructure of 2000 metres of pipes, installed a water tank and chlorination unit, and secured and conserved 1500 hectares of upper watershed forest. The project did not attempt to get municipal government finance, but instead relied on donors. Despite the innovative success of integrating grey and green infrastructure development into one project, forest conservation was still funded by donors (albeit donations for water access, not for biodiversity).

This project has taken the innovation one step further, to try and figure out a way to use municipal public funds for such integrated water systems. What we have undertaken – figuring out how local governments can pay for biodiversity from within water access budgets – will be a quantum leap for conservation financing in Bolivia.

In the first year of the project, we ascertained how to achieve this, and started the field intervention to demonstrate it. In the second year of the project we piloted, replicated, and then started the process to scale the innovation.

Going forward, we see four challenges to this legacy:

- *High cost of raising capital:* Although we have never raised capital, we are confident we will be able to raise scaling capital once we have proven (with an IDB loan over the next two years) that our Minimum Marketable Product (MMP) is viable.
- *Institutional ability to scale:* Prior to the Darwin project, Cuencas Sustentables was able to construct 1-2 integrated water access systems at the same time. For the Darwin project we will need to build 3-4 systems simultaneously. Post Darwin, with IDB funds, our biggest challenge will be to learn how to implement 8-10 or more at the same time. We will do this by hiring project managers from the construction sector.
- *Repayment:* all pilot communities and municipalities are so far repaying on schedule (more or less!). We have had no defaults but will mitigate this risk by undertaking thorough due diligence of each community.
- *Climate Change* will affect all water sources. Our civil engineers will need to design capture systems that are robust enough to account for likely reductions in rainfall.

9 Darwin Initiative identity

We have not yet had many opportunities to publicize our results, although we have had significant discussion about Darwin and the UK Government's contribution to our work with the former British Ambassador, Jeff Glekin and his successor Richard Porter.

We do not have a project X (Twitter)/Instagram/Flickr/Blog/YouTube etc. account but rather make project announcement through our institutional channels.

10 Risk Management

No new risks have arisen in the last 12 months that were not previously accounted for. We have made no significant adaptations to the project design related to risk. Below is a copy of the original risk register, there have been no changes to either risks or probabilities.

Risk Description	Mitigation	Residual Risk
Partners, especially program participants who are not staff, misuse funds or payments are not accounted for	Natura's accounting and safeguards system has been used with and approved by donors including USAID (5 years \$1.7 M), the European Union (8 years, \$2 M) and the Interamerican Development Bank (5 years, \$1.6 M).	Minor
Participants will travel along potentially dangerous roads, resulting in risk of accidents	Natura's travel policies require no travel after dark, respect of speed limits, defensive driving, and vehicle tracking in real time using GPS. We will also take out accident insurance policies for all participants.	Minor
Municipal governments do not provide the expected funding for the three green/grey infrastructure initiatives	Natura annually leverages significant municipal funds for conservation, so we think we can manage this risk. However, if funds cannot be raised for the three projects, then our innovation attempt will have failed. This will not be catastrophic though, as commit to providing the required £150,000.	Severe
Sexual or other harassment or abuse of participants and project Staff	All participants will have to read and sign our safeguards policy. We will identify and publicise the contact details of a female project staff member to be the point of contact for complaints and concerns, to whom anonymous complaints can be made.	Minor
Communities and municipalities do not see the need for investments in green infrastructure	Our objective is to see if this new green/grey model can work. If a community or municipality is not interested in such a project, then we will simply invite the next community/municipality. More than 30 communities have already expressed interest, so we believe that we can find enough appropriate communities	Minor
Conflict between upstream and downstream communities	Our negotiation model is a cooperative community-based participative process, and so can help resolve such conflicts. Our offer to invest along with our primary concept of reciprocity has been shown to be a low-cost, local mechanism for conflict resolution	Minor

11 Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	No
Have any concerns been investigated in the past 12 months	No
Does your project have a Safeguarding focal point?	Yes, Tatiana [REDACTED]
Has the focal point attended any formal training in the last 12 months?	No
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: 62% [5] Planned: 38% [3]
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses. No lessons or challenges	
Please describe any community sensitisation that has taken place over the lifetime of the project; include topics covered and number of participants. All the workshops held with the communities (i.e. the 2,265 beneficiary families) and local authorities have prioritise GESI issues, but we have not received feedback or concerns	
Have there been any concerns around Health, Safety and Security of your staff over the lifetime of the project? If yes, please outline how this was resolved. No concerns registered	

12 Finance and administration

12.1 Project expenditure

Project spend since last Annual Report	2023/24 Grant (£)	2023/24 Total actual Darwin Initiative Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Consultancy costs	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Overhead Costs	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Travel and subsistence	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Operating Costs	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Capital items (see below)	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Others (see below)	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
TOTAL	94,309	94,309		

Staff employed	Cost (£)
Nigel Asquith, Project Leader	
Maximo Garcia, Field team Leader	
Lisette Menacho, Municipal Engagement	
Basilio Perez, Field Technician	
Maria Teresa Vargas, Monitoring and Evaluation	
Faviola Porcel, Legal design	
TOTAL	68,289

Capital items – description	Capital items (£)
None	0
TOTAL	0

Other items – description	Other items – cost (£)
Office Costs Telephone Audit	
TOTAL	1,600

12.2 Additional funds or in-kind contributions secured

Matched funding leveraged by the partners to deliver the project	Total (£)
Donation from Coca Cola as in-kind staff salary	
Donation from Cuencas Sustentables as in-kind staff salary	
Loan from Cuencas Sustentables, that is in the process of being repaid by municipal governments	
TOTAL	164,616

Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project	Total (£)
InterAmerican Development Bank (grant) (contract not yet signed)	
InterAmerican Development Bank (loan) (contract not yet signed)	
TOTAL	370,000

12.3 Value for Money

Overall project cost (Darwin + Counterpart) was ~ £350,000. Almost £115,000 of this has already been repaid back to Cuencas Sustentables, meaning that the total cost of the project is £235,000. This has resulted in:

- 7 municipalities with an innovative financing for integrated water access and conservation
- 4,574 hectares under conservation agreements (£51 per hectare)
- ~ 3,348,168 tCO₂e sequestered (£0.07 per tCO₂e)
- 3,201,800 m³ water returned to the ecosystem (£0.07 per m³)
- 2,256 downstream families with more secure water supplies and increased resilience to climate changes (£104 per family)
- 213 families have received development projects with a value of [REDACTED] compensations for their conservation activities (= each family has received a value [REDACTED] at a cost of [REDACTED] per family)

13 Other comments on progress not covered elsewhere

To build support for the fusion of grey and green infrastructure into an integrated project (i.e., water access plus watershed protection), our marketing and communication strategy focused on two main messages. The focus of these messages to municipal governments – i.e., the potential new investors and participants in the model – was that:

- 1) Clean water is a human right, and investment should be in both constructing water distribution systems and in also protecting the forested upstream “Water Factories”
- 2) Such investments should be structured in the same way as school and hospital construction are financed, through public investments by municipal authorities.

In addition to in person meetings with local authorities in their offices, we produced a series of videos, and we held an international meeting in Santa Cruz, at the UTEPSA University with more than 200 participants, including national, regional and local governments. The meeting was opened by a representative of the State Government of Santa Cruz, and featured speakers from across the Andes.

14 OPTIONAL: Outstanding achievements of your project

I agree for the Biodiversity Challenge Funds Secretariat to publish the content of this section.

Over the two years of the project, we successfully designed and piloted in seven municipalities this innovative financing model for integrated water access and conservation, putting 4,574 hectares under conservation agreements, which translates as ~ 3,348,168 tCO₂e (4,574 ha * 200 tC per ha *3.66). According to calculations undertaken by Conrado Tobon, ecohydrologist at the University National of Colombia (Medellin), one hectare of forest in the project area provided adds extra 700 m³ to streamflow in the dry season so 4,574 hectares under conservation adds 3,201,800 m³ to the ecosystem. The projects have provided more secure water supplies to (and hence have improved the resilience of) 2,256 downstream families and has provided development projects to 213 families as compensations for conservation.

The project achieved all its outcomes, implementing 7 (rather than 3) integrated green-grey systems. We also believe that we are on our way to transformational change given that we have three more projects being implemented, three more in the feasibility stage, and five more in the pipeline. The next phase, post-Darwin is replication, standardization and roll-out. The 96 municipal governments across Bolivia that implemented previous iterations of *Watershared* are potential implementers of the green/grey financing innovation that this project has pioneered. We are currently in the process of negotiating a \$280,000 loan from the Interamerican Development Bank (IDB) (<https://www.iadb.org/en/news/two-innovative-solutions-win-challenge-tackle-water-and-sanitation-needs-latin-america>). IDB economists are helping us make the model self-sustainable.

File Type	Caption, country and credit	Online accounts to be tagged	Consent of subjects received
Images	We have included in the Annex a series of photos		Yes

Annex 1 Report of progress and achievements against logframe for the life of the project

Project summary	Progress and achievements
<p>Impact: Bolivian water users achieve water neutrality (100% replenish) through upstream forest conservation</p>	
<p>Outcome: An innovative, self-financing water access model, integrating grey and green infrastructure, is piloted by local municipalities, conserving 4000 hectares of forest and replenishing 2 million m3 of water annually</p> <p>Outcome indicator 0.1, Three integrated grey/green infrastructure water access/watershed conservation model is designed, built, financed, and maintained by municipal governments and private sector water users (KPI 1: Extent to which intervention is likely to lead to Transformational Change (1 potentially transformational change by March 2024, baseline 0)</p> <p>Outcome indicator 0.2, 4000 hectares of forest are conserved, 2 million m3 of water are restored to the ecosystem, and 300 families have access to clean water (KPI 1: Number of people whose resilience has been improved (1200 people by March 2024, baseline 0); KPI 2 net change in greenhouse gas emissions (tCO2e) (3.6 million tCO2e stored by March 2024, baseline 0), KPI 3 Number of hectares where deforestation has been avoided (4000 hectares by March 2024, baseline 0)</p>	<p>0.1. Design documents, photos of three working systems, financing contracts signed by municipal governments and private water users. The project achieved all its outcomes, implementing 8 (rather than 3) integrated green-grey systems. We also believe that we are on our way to transformational change given that we have three more projects being implemented, three more in the feasibility stage, and five more in the pipeline. We are also in the process of negotiating a \$280,000 loan from the Interamerican Development Bank (IDB) (https://www.iadb.org/en/news/two-innovative-solutions-win-challenge-tackle-water-and-sanitation-needs-latin-america). IDB economists are helping us make the model self-sustainable.</p> <p>0.2. Satellite imagery pre/post project, municipal records of land under signed conservation agreements, hydrological modelling results, faecal coliform load in community water supplies, standard carbon calculations based on existing forest plots. We have put 4,574 hectares under conservation agreements (<i>Folder Output 3.1. Signed conservation agreements</i>) based on contracts signed with seven municipalities (<i>Folder Output 1.1 Design of financial and technical model and Folder "Output 1.3 Municipal decrees approving investments</i>). 4,574 hectares under conservation translates as to be ~ 3,348,168 tCO2e (4,574 ha * 200 tC per ha *3.66). According to calculations undertaken by Conrado Tobon, ecohydrologist at the University National of Colombia (Medellin), one hectare of forest in the project area provided adds extra 700 m3 to streamflow in the dry season. 4,574 hectares under conservation thus adds 3,201,800 m3 to the ecosystem. The projects have provided more secure water supplies to (and hence have improved the resilience of) 2,256 downstream families and has provided development projects to 213 families as compensations for their conservation activities. See file ACCELERATOR PROJECTS DARWIN in the Folder <i>Publicity and publications and project summary</i> for full details and in the same folder there is a World Bank publication that discusses project results.</p>

<p>Output 1 The technical, legal, and financial pathway to implement a green/grey infrastructure public-private partnership model for water access and sustainable watershed management is designed</p>	
<p>Output indicator 1.1. The financial and technical model is designed, and its logic and implementation feasibility confirmed by municipal technicians (by September 2022, baseline, 0 approved models)</p>	<p>1.1. Detailed financial and technical document describing model, with signed approval of municipal technicians. We successfully designed the financial and technical model, as evidenced through three municipal governments (Quirusillas, Tomina and Trigal) approving at and signing contracts (<i>Folder Output 1.1 Design of financial and technical model</i>). These first contracts stipulate the legal justification, the legal process, and the financial details (and we have also added one financial analysis from Tomina, as an excel file)</p>
<p>Output indicator 1.2, the legal pathway for municipal investment in watershed conservation is designed and verified (by September 2022, baseline, 0 approved legal pathways)</p>	<p>1.2. Legal document describing governmental financing options, with signed approval of municipal lawyer. We worked with a constitutional lawyer to iteratively develop templates of legal contracts that would facilitate municipal financing. The attachments in the other annexes show the basic contract design (<i>Folder Output 1.2 Legal document describing governmental options</i>) we have attached a template for another financing option that the lawyer developed designed for larger jurisdictions)</p>
<p>Output indicator 1.3, Three municipalities commit to investing in pilot green/grey infrastructure projects (by March 2023, baseline, 0 municipal investments)</p>	<p>1.3. Letters of approval or municipal decrees approving investment After the three-municipality trial, the project facilitated the full commitment of four additional municipalities (Pasorapa, Villa Serrano, Moro Moro and San Rafael (Sapoco). Three of these letters of approval contracts are attached in Annex 1 (<i>Folder “Output 1.3 Municipal decrees approving investments</i>).</p>
<p>Output 2. A green/grey infrastructure public-private partnership model for water access and sustainable watershed management is financed by municipal governments and tested by local stakeholders.</p>	
<p>Output indicator 2.1. Three water access systems (the grey infrastructure of tanks, dams, pipes etc.) are built (by December 2023, baseline, 0 systems)</p>	<p>The Folder “<i>Output 2.1. Receipts of delivery of water access system</i>” includes delivery proof from Villa Serrano, Moro Moro and San Rafael municipalities, plus selected photos of the delivered grey infrastructure. These documents show that three water access systems were built and were delivered to and accepted by the Municipal Governments.</p>
<p>Output indicator 2.2. Three communities implement a new user tariff to cover maintenance costs of the water distribution system and watershed conservation (by July 2024, baseline, 0 tariffs)</p>	<p>2.2. Statutes of new tariff rules, bank statements or receipts showing fee payments. All seven communities have committed a repayment schedule based on new tariffs charged to the water users. We have attached these for the municipalities of El Trigal and Villa Serrano in Folder “<i>Output 2.2. Statutes of new tariff rules, bank statements</i>”. See the file ACCELERATOR PROJECTS DARWIN in the Folder <i>Publicity and publications and project summary</i> to list the current</p>

	<p>repayment status of each municipality. Of the \$317,247 of counterpart funds we have spent on the grey-green infrastructure during the project lifetime, \$146,813 (46%) has been repaid.</p>
<p>Output indicator 2.3. Water systems are managed sustainably by three newly created community-based water management institutions (3 institutions created by March 2024, baseline, 0 systems managed, 0 institutions trained)</p>	<p>2.3. Articles of incorporation of new community-based institutions, signed training attendance reports, levels of free chlorine levels in system We have built the institutional frameworks (or are in the process of building them) to allow community members to manage and maintain their new water systems, as evidenced in Folder <i>Output 2.3. "Articles of incorporation of new community-based institutions"</i></p>
<p>Output 3. Local communities manage their water supplies sustainability and conserve their forests</p>	
<p>Output indicator 3.1. 4000 hectares of watershed forests are protected from agriculture and cattle through fencing and/or compensation payments to owners (by December 2023, baseline, 0 hectares)</p>	<p>3.1. Signed conservation agreements (including maps). The total area of land put under conservation agreements in Quirusillas, Tomina, Trigal, Villa Serrano, Moro Moro, Pasorapa and San Rafael sums to 4,574 hectares. <i>Folder Output 3.1. Signed conservation agreements</i> includes a selection of agreements signed by upstream landowners in Villa Serrano, Moro Moro and Trigal</p>
<p>Output indicator 3.2. Protected forests are patrolled monthly to ensure compliance and, if necessary, incompliance is sanctioned and restorative measures applied (2 patrols per month, 100 beneficiary families of which 200 beneficiaries are female, by March 2024, baseline, 0 patrols, 0 families with clean water)</p>	<p>3.2. Patrolling reports, levels of fecal coliform in household water supplies, village surveys, records of any required restoration measures Folder <i>Output 3.2. Patrolling reports</i> includes monitoring reports from Villa Serrano and Moro Moro. Compliance has been generally high, but some landowners clearly did not fully understand their commitments. For example, of the 11 landowners in Villa Serrano, nine complied fully with their agreements, while one had opened an access road to part of his land, and one had cut a part of his forest. We are in the process of sanctioning these incompliances, but using the logic that we start with short-term tolerance to build long term trust, and hence sustainable conservation.</p>

Annex 2: Project’s full current logframe as presented in the application form

Title: Replenishing Bolivia's Water Footprint: Scaling Watershed Conservation through Public-Private Partnerships			
Project Summary	SMART Indicators	Means of Verification	Important Assumptions
Impact: Bolivian water users achieve water neutrality (100% replenish) through upstream forest conservation			
Outcome: An innovative, self-financing water access model, integrating grey and green infrastructure, is piloted by local municipalities, conserving 4000 hectares of forest and replenishing 2 million m3 of water annually	0.1. Three integrated grey/green infrastructure water access/watershed conservation model is designed, built, financed and maintained by municipal governments and private sector water users (KPI 1: Extent to which intervention is likely to lead to Transformational Change (1 potentially transformational change by March 2024, baseline 0))	0.1. Design documents, photos of three working systems, financing contracts signed by municipal governments and private water users	We assume that municipal governments and private sector water users have sufficient financing to develop grey/green infrastructure projects. We base this assumption on Bolivia's decentralization laws, that guarantee municipal funds for communities, linked with the high demand for community water projects caused by the increasing frequency of drought in Bolivia. We also assume that communities are willing and able to conserve their forests, and that there is a link between forest conservation and water quality, these assumptions being based on our previous successes protecting 500,000 hectares of forests through community watershed conservation agreements.
	0.2. 4000 hectares of forest are conserved, 2 million m3 of water are restored to the ecosystem, and 300 families have access to clean water (KPI 1: Number of people whose resilience has been improved (1200 people by March 2024, baseline 0); KPI 2 net change in greenhouse gas emissions (tCO2e) (3.6 million tCO2e stored by March 2024, baseline 0), KPI 3 Number of hectares where deforestation has been avoided (4000 hectares by March 2024, baseline 0)	0.2. Satellite imagery pre/post project, municipal records of land under signed conservation agreements, hydrological modelling results, fecal coliform load in community water supplies, standard carbon calculations based on existing forest plots	
Outputs:			
1. The technical, legal, and financial pathway to implement a green/grey infrastructure	1.1. The financial and technical model is designed, and its logic and implementation feasibility confirmed by municipal technicians (by September 2022, baseline, 0 approved models)	1.1. Detailed financial and technical document describing model, with signed approval of municipal technicians	The fundamental assumptions underlying this proposal are that 1) we can integrate grey and green infrastructure into one single project 2) an integrated project will be only marginally more expensive than a standard grey infrastructure project, and 3) we can

public-private partnership model for water access and sustainable watershed management is designed	1.2. The legal pathway for municipal investment in watershed conservation is designed and verified (by September 2022, baseline, 0 approved legal pathways)	1.2. Legal document describing governmental financing options, with signed approval of municipal lawyer	convince municipal governments to pay for such integration. The innovation of our proposal will be in rigorously testing these assumptions. Bolivian communities and municipal governments have historically spent (and wasted) hundreds of millions of pounds on water access projects that have ignored upstream land use. This is especially ironic given that Natura's experiences show that watershed conservation can be remarkably inexpensive (less than £1 /ha/year). Significant municipal investments in integrated water access - watershed conservation projects thus seem financially possible (and indeed logical). What we don't yet know are the precise mechanisms by which we can such make integrated green/grey projects technically, legally and politically possible (and then widespread)
	1.3. Three municipalities commit to investing in pilot green/grey infrastructure projects (by March 2023, baseline, 0 municipal investments)	1.3. Letters of approval or municipal decrees approving investment	
	1.4. Project lessons are learned, published, disseminated, and discussed with at least 100 municipal leaders and 500 community members from around Bolivia (by March 2024, baseline, 0 meetings to discuss lessons)	1.4. Lessons learned document, list of meeting attendees	
2. A green/grey infrastructure public-private partnership model for water access and sustainable watershed management is financed by municipal governments and tested by local stakeholders.	2.1. Three water access systems (the grey infrastructure of tanks, dams, pipes etc.) are built (by December 2023, baseline, 0 systems)	2.1. Receipts and contracts, photos, signed acceptance of delivery of water access system by community and municipal authorities	We assume that Municipal governments will be able and willing to pay for the green/grey projects. We also assume that even once the projects have been approved, government bureaucratic processes will take significant time to access the finance. We will therefore use £150,000 of our own funds (from Cuencas Sustentables, not counterpart funds) to pre-finance the construction and conservation -- i.e., build the infrastructure and demarcate the conservation areas. Municipal governments will only pay for each of the water access and watershed conservation systems upon completion (i.e. only at the end of the project will they re-pay our pre-financing). We will use Darwin funds ONLY for the design and development of the model concept, and lesson learning. If all our assumptions are correct, and the project
	2.2. Three communities implement a new user tariff to cover maintenance costs of the water distribution system and watershed conservation (by July 2024, baseline, 0 tariffs)	2.2. Statutes of new tariff rules, bank statements or receipts showing fee payments	
	2.3. Water systems are managed sustainably by three newly created community-based water management institutions (3 institutions created by March 2024, baseline, 0 systems managed, 0 institutions trained)	2.3. Articles of incorporation of new community-based institutions, signed training attendance reports, levels of free chlorine levels in system	

			succeeds, then the municipal governments will pay us back our £150,000 by March 2024. If our assumptions were wrong, and Output 2 fails, we will have lost our own money, not Darwin funds.
3. Local communities manage their water supplies sustainability and conserve their forests	3.1. 4000 hectares of watershed forests are protected from agriculture and cattle through fencing and/or compensation payments to owners (by December 2023, baseline, 0 hectares)	3.1. Signed conservation agreements (including maps)	We assume that communities will agree to conserve their forests in order to safeguard their water supplies and that they are able to do so. To minimize risk we will select communities with full legal title to the land, and with no clear and apparent risk of outsiders entering illegally.
	3.2. Protected forests are patrolled monthly to ensure compliance and, if necessary, non-compliance is sanctioned and restorative measures applied (2 patrols per month, 100 beneficiary families of which 200 beneficiaries are female, by March 2024, baseline, 0 patrols, 0 families with clean water)	3.2. Patrolling reports, levels of fecal coliform in household water supplies, village surveys, records of any required restoration measures	

Activities 1.1.1. Analyse literature to evaluate previous similar experiences in other fields 1.1.2. Meet with 20 municipal authorities and technicians to discuss concept and analyse options 1.1.3 Design draft model, share with partners and refine based on feedback 1.1.4 Finalize model and present to municipal collaborators for approval. 1.2.1. Analyse legal precedents to identify options 1.2.2. Meet with 10 municipal lawyers to discuss concepts and analyse options 1.2.3. Design draft of proposed legal pathways, share with partner lawyers and refine based on feedback 1.2.4 Finalize model and present to municipal lawyers for approval. 1.3.1. Analyse municipal documents and landuse maps to identify potential communities. 1.3.2. Discuss potential sites with municipal leaders and community members 1.3.3. Develop concept proposals for green/grey infrastructure in 10 communities and discuss with stakeholders 1.3.4. Select sites with greatest potential and finalize project design, 1.3.5. Submit proposals into annual municipal budgeting process 1.3.6. Work with municipal technicians to ensure acceptance of proposals into municipal budgets. 1.4.1. Publish and distribute lessons-learned document 1.4.2. Organize meetings and workshops to present findings to 100 municipal leaders across Bolivia. 2.1.1. Build grey infrastructure systems (pipes, dams, tanks, chlorinators/purifiers etc.), 2.1.2. Deliver functioning water access system to community members and municipal officials, 2.1.3. Municipal governments reimburse project for funds expended in construction. 2.2.1. Hold meetings to discuss new community-based maintenance tariffs, 2.2.2. Community members organize implement new tariff system. 2.3.1. Identify community members and train them in system management and monitoring, 2.3.2. Community members manage chlorination systems to maintain free chlorine at a concentration of 0.3-0.5 mg/l in community water supplies 2.3.3. Chlorine tablets are replaced on schedule and system is maintained. 3.1.1. Present and discuss watershed conservation agreement model with landowners and community members. 3.1.2. Negotiate compensation packages, and draft contracts that define responsibilities and rights. 3.1.3. Sign conservation agreements and deliver compensation packages such as fruit tree seedlings,

honey production equipment etc. 3.2.1 Community members walk transects within the conservation area and report incursions or other threats to local and municipal authorities. 3.2.2. Define penalties for infractions, notify and sanction infractors, and repair damages to watershed, such as replanting.

Annex 3 Standard Indicators

Table 1 Project Standard Indicators

Indicator number	Name of indicator using original wording	Units	Disaggregation	Year 1 Total	Year 2 Total	Total achieved	Total planned
DI-A03	Number of local/national organisations with improved capability and capacity as a result of project.	People	# of Municipal Governments. # of water users associations.	0	7 7	7 7	3
DI-B03	Number of new/improved community management plans available and endorsed.	Number	# of community watershed management plans.	0	7	7	3
DI-C01	Number of best practice guides and knowledge products published and endorsed.	Number	Best practices/lessons learned guide based on project experiences.	0	1	1	1
DI-D01	Hectares of habitat under sustainable management practices.	Area, hectares	# of hectares in community controlled protected areas	0	4,574	4,574	4000
DI-D02	Number of people whose disaster/climate resilience has been improved.	People	# of people, # of women # of girls with water and food security	0	11,280 (2,256 families * 5 members per family)	11,280 2,256 women 3,384 girls	1200 600 300

Table 2 Publications

Title	Detail (authors, year)	Gender of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Leveraging Citizen Action for Water Conservation	2023	Female	World Bank Washington DC	https://documentos.bancomundial.org/es/publication/documents-reports/documentdetail/099417306192332086/idu06658fbc60f1620466d0b1830ec00fc674340

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the correct template (checking fund, type of report (i.e. Annual or Final), and year) and deleted the blue guidance text before submission?	Yes
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	No
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line. All supporting material should be submitted in a way that can be accessed and downloaded as one complete package.	Yes
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 14)?	Yes
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Yes
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	