

Final Report on Rufford Innovation Award I-101

Business Planning for a New Protected Area: the Rio Grande-Valles Cruceños ANMI, Bolivia

Executing Institution's profile

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Executive Summary

In March 2008, Fundación Natura Bolivia was awarded £50,000 as an Innovation Award from the Rufford Foundation. The goals of Natura's Rufford project were to:

1. Develop plan to conserve the biological diversity of the Rio Grande-Che Guevara Protected Area in order maintain water supply and minimise the impact of future flooding
2. Improve local livelihoods through self-sustaining initiatives
3. Develop business plan for large-scale 'payments-for-environmental-services (PES)' initiative to serve as a model for Bolivia.

We achieved significant progress towards these goals. In addition to developing and publishing a management plan for the area, we facilitated the piloting of four locally -led, -managed, and -funded payments for environmental services financing mechanisms.

- In counterpart to the £7,920 directly invested into the funds by Rufford, the local authorities invested £9,653 as the first (2009-10) step in a 20 year commitment to upper watershed conservation
- The recently elected Mayor of Vallegrande, the largest of the municipalities in the protected area, declared his commitment to conserve every single upstream water source in his jurisdiction
- The project catalyzed the creation of the mancommunity of the Rio Grande Protected Area—an institution for municipal leaders committed to conservation through a grand 7-municipality alliance—with an additional local starting commitment of £5,500 a year.

Within the pilot PES schemes, in return for conservation of more than 1000 ha of biodiverse forest, Rufford funds provided have compensation payments to 35 families: these payments varied from fruit tree seedlings, to barbed wire to hosepipes for irrigation. By supporting the management of the protected area, the project has started to help the 2500 families that live within its limits.

1. Introduction

In March 2008, Fundación Natura Bolivia was awarded £50,000 as an Innovation Award from the Rufford Foundation. The goals of Natura's Rufford project were to:

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3. Develop business plan for large-scale 'payments-for-environmental-services (PES)' initiative to serve as a model for Bolivia.

Goals 1 and 2 have been achieved successfully. Managers of the 734,000 ha hectare protected area are now beginning to implement the Rufford-funded management plan, and the project has developed a series of payments for watershed services schemes that channel funds from downstream water users to upstream conservation activities. These scheme have been successfully initiated, albeit in the pilot phase, in four municipalities, with the Rufford seed investment of £7,920 into the water funds, being more than matched by the local authorities.

The Water Funds work like this: Municipal Government, the community water cooperative and Natura Bolivia have signed commitments for 10 years to each invest money (via donations, block grants and increases in water tariffs) to create local Water Funds. These funds then channel resources—alternative livelihood tools such as beehives for honey production—to upstream landowners, in return for long-term commitments to conserve their forests. Although these pilot schemes are still less than a year old, more than 30 upstream families are receiving benefits from conserving their forests under conservation contracts.

As an example, in the village of Huertas in the Charanguero watershed of Pucara municipality, Mr. Claudio Gutierrez received 6 bee boxes and equipment for honey production, worth almost £350, in exchange for a commitment to conserve 29 ha of forest for 20 years, while Mr. Constatino Guerreo is conserving 28 ha of forest in exchange for 1400 m of piping, worth £220, to allow him to irrigate his crops. Given that the annual average income in the Charanguero community is less than £700, these are significant increases in well-being. The conservation of the Charanguero forests also has two indirect benefits for poverty reduction. Firstly, all 70 community members are now able to access cleaner water. Secondly, the stream powers a microhydroelectric plant, and with water flowing faster and cleaner, 700 families in 17 rural communities have more reliable electricity supplies.

Municipality	Watershed	Government + Water Coop match for Rufford / Natura funds	Hectares to be conserved in phase 1	Cost per ha /year	Upstream provider families	Beneficiary families
Moro Moro	La Tranca, 592 ha	£864+ £1234 per year for 10 years	137	£1.4	11	300
Pucara	Charanguero, 1280 ha	£864+ £86 per year for 10 years	662	£0.35	13	400
Postrevalle	Los Pozos, 250 ha	£493 + £185 per year for 10 years	90	>£1.2	10	300
Vallegrande	Palmarito, 500 ha	£987 + £4937 per year for 10 years	166	>£1.2	2	1000
TOTAL	2622 ha	£9653	1055	£1/ha/yr	35	2000

In such a short project, we have not yet been able to measure positive changes in species conservation. However we can report that more than 1000 ha of forest are now formally

conserved under long term contracts at a cost of less than £1/hectare/ year. By conserving upstream forests through formal contracts we have reduced the threat of clearing or cattle grazing on these lands for 20 years. Such conservation will likely also have a positive effect on aquatic biodiversity in the watersheds and on downstream water quality. In 2010, using counterpart funds, we completed baseline surveys of water quality (levels of fecal coliforms, temperature and turbidity), and macroinvertebrate diversity at 3 locations (above, within and below each community) in every (i.e 120) community in the Rio Grande Protected Area.

In 2011 we will undertake abundance and diversity measurements of two taxa (dung beetles and amphibians) as proxies of biodiversity in general, in the same 120 communities. With these baseline datasets completed, we will be able to measure, with a high degree of accuracy, changes in the environment. Because we will be measuring such change in communities where we work, *as well as in communities where we do not work*, we will be able to accurately attribute such any changes caused by the PES intervention.

We thus believe that the Rufford-funded project has laid an important foundation for guaranteeing water supplies in upstream and downstream communities in the reserve.

In addition to water scarcity, one of the world's greatest environmental challenges is climate change. The Rufford project has proved to be a first step in developing a sustainable source of financing for climate change adaptation and mitigation. The project has already catalyzed local funds for forest protection: the reciprocal agreements through which water users pay to maintain forest cover provide a grass-roots source of adaptation finance, negotiated by the local community, for the local community. In addition, focusing the compensation payments on productive activities will develop new income generation opportunities that are alternative and complementary to agriculture. Upstream recipients of compensation from the Water Funds will use their capital to diversify their activities, for example, into honey production, which is not as dependent on local weather patterns as is agriculture. These new activities and incomes, which diversify risk, will be a first step in a local adaptation to climate change.

The Rufford project is thus a first step to ensure:

1. **Water security for east-central Bolivia** (protection of upstream water sources)
2. **Climate Change (CC) Mitigation and Adaptation** (conservation of water producing dense tropical forests, and shifting local economies away from climate-dependent annual agriculture to alternatives such as honey production and perennial fruticulture)
3. **Sustainable Financing of CC Mitigation and Adaptation** (development of municipality-managed and-financed Watershed Protection Funds)
4. **A CC Mitigation and Adaptation Model** that can be applied nationally/internationally

The development of the Rufford-supported model responds to the agenda of the UNFCCC COP16 in Cancun, where parties agreed upon a forest deal to provide finance for countries who avoid emissions from deforestation, to finance developing countries adaptations to climate change, and a new UN climate fund. As we try and refine it further, the project model will demonstrate to the parties how grassroots, bottom-up initiatives can provide both complementary financing and local monitoring capability, in order to ensure that CC mitigation and adaptation activities are results-oriented and additional.

2. Evaluation of Specific Project Activities and Outputs

PROPOSED ACTIVITY	ACTUAL RESULTS AND OUTPUTS
Objective 1: Develop plan to conserve the biological diversity of the Rio Grande-Protected Area to maintain water supply and minimise impact of future flooding	
<p>1.1: <i>Complete basic studies to define key areas to zone for upper watershed forest management.</i> We will subcontract local institutions and experts to undertake the necessary hydrological and socio-economic research required to appropriately delimit the protected area, its core, and areas for integrated use.</p>	<p>Throughout 2009 we undertook a series of baseline studies of the ANMI Rio Grande-Valles Cruceños including analyses of birds, fish, mammals and plant diversity, socio-economics and culture, and hydrological modelling. Some of the more interesting results are that the ANMI supports:</p> <ol style="list-style-type: none"> 1) Three major forest ecosystems; Boliviano-Tucumano, Chiquitano and Dry InterAndean 2) 96 families, 933 genera, and 2415 species of plants, (161 endemic, 55 endangered) 3) 58 fish species, 362 bird species (including three endemics) and 105 mammal species (four endemics) <p>Based on the hydrological modelling results, Sampurno Bruijnzeel (Vrije University Amsterdam) Stefan Uhlenbrook of the UNESCO IHE (Institute for Water Education, Delft, Netherlands) and Mauricio Auza (San Simon University, Cochabamba, Bolivia) visited the Rio Grande PA in 2010. The team concluded that in order to significantly improve on the Rufford-funded modelling, we needed far more intensive field data collection. We were thus able to successfully leveraged our Rufford results to gain €240,000 from UNESCO-IHE to fund a PhD plus four Masters theses. These hydrological studies have been initiated: meanwhile we continue to use the project-funded modelling results.</p>
<p>1.2: <i>Undertake municipal meetings in the upper watershed to develop support for forest management /conservation.</i></p>	<p>We have held literally hundreds of meetings in the five upstream ANMI municipalities (Moro Moro, Pucara, Vallegrande, Samaipata and Postrevale) developing the concept of the protected area and a decentralized management structure. We created the “Mancommunity” of the Rio Grande-Valles Cruceños: an association of the Municipal Governments of the area that will act as overall decentralized management authority for the protected area.</p>
<p>1.3: <i>Develop management plan with local authorities.</i> Based on the results of the hydrology and socioeconomics studies we will refine the management plan, which will then be circulated among upstream and downstream stakeholders.</p>	<p>After a yearlong process involving five staff from the Santa Cruz Department Protected Areas Directorate, two Natura administrators and 18 technical staff, and 40 municipal and local authorities, we completed the Management Plan for the ANMI Rio Grande. The plan comprises 69 pages of background, a 10-page zoning proposal (see Annex 1 for primary zoning map), 55 pages describing the proposed management structure and 107 priority activities, and was approved by the Departmental Government in December (available in Spanish on request). The results of the initial data collection process, funded by Rufford, persuaded Harvard University to collaborate with us on a baseline socioeconomic analysis of all families in the ANMI.</p>

Objective 2: Improve local livelihoods through self-sustaining initiatives

2.1: Meetings with downstream water users to build consensus about scale of flooding problem. The goal of this project, and what makes it innovative, is that we will be asking well-off downstream farmers to pay the costs of reserve management.

On October 17th 2009 we held a forum in the town of Vallegrande that brought together upstream farmers and municipalities with the industrial agriculturalists from lowland Santa Cruz. We have since undertaken a series of individual meetings with downstream water users, both agro-industry (ANAPO) and the city of Santa Cruz (SAGUAPAC, private businesses, and the Municipality). While the lowland environmental service users showed interest in the concept of financing upstream land management, they expressed a desire to see more data before committing funds, and a general wariness to contribute to a high-profile initiative, given the current political instability in Bolivia.

We have started collecting the hydrology data through the UNESCO funded Ph.D. and Masters, and have also focused our more grass roots actions working with the water cooperatives and local governments in the upland municipalities within the Rio Grande Protected Area. Even within these “upland” municipalities, there are upstream landowners and downstream water users, so in Moro Moro, Postrevalle, Vallegrande and Pucara we spent significant project resources on a series of meetings with municipal governments and the water and electricity cooperatives about the importance of preserving water-producing forests.

2.2: Negotiate with downstream farmers to develop payment schemes. As the results of the scientific studies become available we will present them downstream, in order to develop a model payments scheme.

Negotiations with the lowland municipalities are on hold, pending more detailed hydrological data, but within the uplands municipalities we advanced significantly in creating mini “Water Funds” by which Municipal Governments, local cooperatives and Natura can invest in upstream conservation. Our greatest efforts were in developing the infrastructure within local institutions where the water funds could be based. We then identified four micro watersheds (2622 ha) in four municipalities to pilot the Water Fund concept, and used £7,920 of Rufford seed capital to leverage a commitment of £9653 from the local authorities.

2.3: Finalize payments system, so downstreamers fund PA operating costs. We will ensure that a payments system has been designed and is ready to function as soon as the management plan is approved, so indemnifications and management can be funded immediately

Although we did not advance as far as we had hoped in developing the large-scale lowlands-highlands PES scheme, our focus on developing within-municipality PES schemes has had immediate results. In the Rufford-funded first phase of the project, 35 upstream families committed to protect 1055 ha at a cost of £1/ha/yr, to ensure that 1000 downstream beneficiaries continue to receive water.

All project beneficiaries are poor agriculturalists, a mix of women and men. As the project expands, we expect to see proportionately large changes in wellbeing for women and children, because women will benefit especially from new activities such as honey and fruit production that diversify income generation away from full-time, manual agriculture.

Objective 3: Develop business plan for large-scale ‘payments-for-environmental-services (PES)’ initiative to serve as a model for Bolivia.

3.1: Develop business plan that identifies income sources, and prioritizes their development. A business plan for reserve will be completed, focusing on short and medium term income generation.

Initial analyses concluded that there was a potential for three major revenue streams from the Rio Grande Protected Area: 1) carbon revenues from the high forests of the municipalities of Gutierrez and Cabezas; 2) tourism at more than 75 sites (13 of which were prioritized) and; 3) payments from lowland farmers for mitigation of flooding risks.

Based on preliminary results of the Rufford project we negotiated with a Bangkok-based environmental investment company (www.nollengroup.com), to undertake a more detailed business plan of the area. The mission of the Nollen Group is to “strengthen financing mechanisms for sustainable development investment in order to link innovative projects that tackle key social development and environmental challenges with investors who seek attractive risk-adjusted returns.” The Nollen Group, represented by Gijsbert Nollen (Chief Executive Officer) and Philip Williams (Assistant Investment Manager), made two visits to Santa Cruz in 2008/9.

During the period of the project, however, the political instability of Bolivia weighed heavily on the possibility of realizing the potential of carbon and tourism revenue streams. The Bolivian government position on REDD—i.e. outspoken opposition to market-based mechanisms—has served to scare away from Bolivia both voluntary and bilateral government carbon investors. The specter of protests and a generally unfavorable and uncertain business environment (epitomized by the recent “nationalization” of the oil and gas industry) has equally made tourism investments in Bolivia very high risk.

The Nollen Group business plan therefore concluded that the only viable short-term revenue stream was payments for flood mitigation.

3.2: Identify attractions, and design payments system by which local authorities can receive tourism benefits. At least three priority sites will be identified, with payment concession systems designed and agreed upon.

Although our consultant (Michael Blendinger) identified more than 75 attractions, and we looked intensively at one site (Yumao) to set up an eco-tourism program, we eventually decided not to focus on tourism as a potential short-term solution. Our analysis—shared by the Nollen Group—is that Bolivian politics are currently too unstable to make tourism a reliable income stream for the protected area. In addition, we realized that the attractions with highest potential, such as sport fishing in Yumao, would require greater investment than the Rufford project allowed us. We therefore decided to postpone investments in tourism infrastructure, and instead focus the Rufford “priority investments” on important sites for water provision/flood prevention. We thus used Rufford funds to identify the Water fund sites described above, and to kick start the payments and compensation mechanisms.

3.3. *Publish lesson learned documents and 'business-planning' manual for developing PES initiatives.* We will publish a how-to manual and at least two other articles in popular and academic journals.

As a first attempt at a PES “how-to guide”, we published *Payments for Watershed Services: The Bellagio Conversations*, edited by Nigel Asquith and Sven Wunder, which shared lessons learned from practical experiences of PES implementation from around the globe. Based on our experiences in Rio Grande—and thus based partially on our Rufford-funded work—we re-published a version of this document in Spanish in February 2009, which covers issues such as the role of law and policy, the level of investigation required, transaction costs, the “bundling” of environmental services, how to stimulate service users to pay, poverty reduction, how to balance efficiency and fairness, and the scale of PES schemes. During the Rufford grant we also published the following articles using counterpart funds:

Le Tellier, V., A. Carrasco & N.M Asquith. 2009. Attempts to Determine the Effects of Forest Cover on Stream Flow by Direct Hydrological Measurements in Los Negros, Bolivia. *Journal of Forest Ecology and Management*. **258: 1881-1888.**

Asquith N.M., M.T. Vargas Ríos & S. Wunder. 2008. Selling two environmental services: In-kind payments for bird habitat and watershed protection in Los Negros, Bolivia. *Ecological Economics* **65: 675-684.**

Vargas, M.T., M. Forno, S. Secomb and J. Torrico. 2010 Compensation for Hydrological Services in Bolivia: the Comarapa Municipal Water Fund. *Mountain Forum Bulletin* **76-79.**

In terms of more “popular” publications, the results of the Rufford project provided important input into a series of meetings and conferences facilitated by Natura Bolivia, including the following:

- El Agua en Nuestros Manos (case studies of watershed cooperativismo)
- El Agua en Nuestros Manos (meeting report)
- RACSA Meeting reports

Electronic versions of all these publications are attached to this report; hard copies are available on request.

3. Project Impact

The Rufford project received a boost in 2009, when we negotiated with Harvard University to help us develop baseline statistics for the Rio Grande Protected Area. We now count on baseline socioeconomic and water quality surveys in all 120 communities (and every single household (2500)) in the Protected Area (and will initiate biodiversity monitoring in 2011). Thus, although we cannot yet say if and by how much people’s economic situation, water quality and biodiversity have changed, we do have the baseline data so we will be able to make this calculation in the future.

The 2010 baseline socioeconomic surveys, included quantification of incomes and living standards. When we return to redo the survey three years from now, we will be able to measure changes in living standards and welfare. Because we will be measuring such change in communities where we have work with Rufford funds, *as well as in communities where we have not worked*, we will be able to accurately attribute such any changes caused by the project interventions. In the meantime, we can infer the following impacts:

Number of..	Direct	Indirect	Details
Hectares affected on the ground	1,055	2,622	In the pilot watersheds in the four municipalities, we identified 2,622 ha that will be protected under conservation contracts. All landowners of these hectares are considering joining the project. In the Rufford-funded phase 1, there are 1,055 ha already under contract.
Hectares affected by policies	734,000	734,000	The Project helped create the Mancommunity of the Rio Grande Protected Area, an institution for municipal leaders committed to conservation of the 734,000 ha reserve, through a grand 7-municipality alliance. The municipal leaders then made a commitment of £5,500 a year to start the process.
Households	35	2,500	In the first phase of the project, Rufford funds have provided compensation payments to 35 families: these payments varied from fruit tree seedlings, to barbed wire to hosepipes for irrigation. By supporting the management of the protected area, the project has started to help the 2500 families that live within its limits.

The socioeconomic baseline data are still being tabulated and analyzed, but for example preliminary analysis of the data suggest that, for example, almost 50% of children spent time out of school in the last year because of diarrhea, likely caused by polluted water. As the project begins to clean up the community water supplies, we expect we will see a reduction of childrens' time out of school sick.

4. Lessons Learned and Scaling up

By operating in four municipalities we have been able to experiment with slightly different modalities. For example, in Moro Moro the project was joint with the Municipal Government and the Water Cooperative together, while in Vallegrande, although working with both, doing so in a somewhat parallel manner, rather than in a three-way partnership, and in Pucara with an electricity cooperative rather than the Water Cooperatives. All these variations have led to useful lesson-learning for the future. Probably the biggest "change" caused by the project was the realization that we needed to change the name of our intervention. In Los Negros we started seven years ago with the term "*payments*" for watershed services, and for the last three years we switched to "*compensation*" for watershed services to focus on the non-mercantilist nature of our work. The Rio Grande project has shown the need to change the name again, to "*reciprocal agreements for water*" to better reflect our long-term goal of local self sustainability of the initiative which does not involve outside leadership or finance.

Based on the early results of the project we drafted the Bolivian National Parks Service (SERNAP) strategy for protected areas and environmental services. SERNAP is about to start implementation of its strategy, in consortium with Natura, at sites around Amboro, Inao and Tunari National Parks. In addition, in order to see if the Rufford project model can work in other contexts, we are now replicating it, through an alliance with Rare Conservation in Washington DC, at 11 sites in the northern Andes (i.e. Bolivia, Peru, Ecuador and Colombia (see <http://www.rareconservation.org/program-aze-habitat-and-watershed-protection-andes>)).

The US Government Fish and Wildlife Service has added 2 more years worth of seed capital (£33,000) for the Rufford-initiated Water Funds. Given the innovative, and apparently successful, logic of this project, a number of donors, including Harvard University (£35,000) and the British Government (NERC/DFID, \$220,000) have committed funds to develop a series of “lessons learned” of how best to undertake incentive based watershed management through locally developed downstream Water Funds.

The Rufford-funded project has helped Natura consolidate its reputation in two areas. We are now recognized as a leader in the development of grass-roots locally-managed payments for watershed services schemes: this has allowed us to play an advisory role to various institutions, including water cooperatives, international NGOs and national governments (Bolivia and South Africa). The project has also cemented our profile as catalyst and leader in the creation and management of the Rio Grande Protected Area, thus allowing us to advise national and departmental authorities on PA management.

After the Rufford project finished, Natura organized two international workshops, during which we discussed the potential of incentive-based conservation with various Bolivian politicians. After the events, the international speakers accompanied us on a field trip to some of the Rufford project-funded sites in the Rio Grande Protected Area. We used this field trip as an external, independent evaluation of the project. We therefore asked the international experts (John Liu of IUCN, plus Sven Wunder and Jan Borner of CIFOR, Christo Marais and three South African managers of the Working for Water Program, and German Mosqueras of Ecuador’s SOCIOBOSQUE Program) to comment on, evaluate and recommend improvements to the Water Funds and conservation schemes we set up with Rufford funds in Postrevalle, Pucara, Moro Moro and Vallegrande.

The report of the South African government representatives perhaps best captures what we feel we have achieved with Rufford support:

“In one ... example the project has a reciprocal agreement with the local land user for the protection of ... two hectares around a spring. The fenced in hectares are largely intact ensuring that the water source is protected. The social impact of the project on the other hand is much more than the two hectares. Local land users actively participate in project events with the result that watershed services is starting to become a “mainstream” activity in the community. At the moment Natura measures its success according to the number of hectares conserved. Although it is a good indicator it should not be the only indicator. A small area with a large social/educational impact is as valuable as a large area with very little social/educational impact. A key lesson (is) that size (of the area protected) does not always count as much as we think. The long-term success of watershed management is not only going to depend on the number of hectares that are being protected today”.

“South Africa can learn from Bolivia about how to get true buy in for watershed services from local authorities, catchment management agencies and water user associations. Although projects are being implemented at a small scale the social impact of the projects goes way beyond the geographical borders of the (Rufford) project”.

Dr. Christo Marais, Operations Chief,
Working for Water, South Africa

Proposed Budget and actual expenditure

	Proposed Budget	Actual Expenses
Salaries	£22,050	£19,421
Executive Director	2,200	3,300
Director of Science	1,500	2,376
Economist	5,500	957
Biologist	1,500	1,980
PES Consultant	2,350	2,970
Tourism Consultant	2,500	3,234
Extensionist	400	528
Other consultants	6,000	4076
Travel	£9,650	£9,975
Per diems	3,650	3,620
Vehicle, fuel, maintenance	6,000	6,355
Equipment	£2,750	£3,519
Equipment for biological surveys	2,750	3,519
Other Direct Expenses	£11,000	£11,836
Meetings	5,000	3,916
Small grants to "pump prime" investments in priority sites	6,000	7,920
Publications and diffusion of lessons learned	Counterpart	Counterpart
Total Direct Expenses	£45,450	£44,752
Overhead/Indirect costs	4,550	5,248
Total Expenses	£50,000	£50,000

Figure 1. Zoning Map of the Rio Grande-Valles Cruceños Integrated Management Area (taken from Area Management Plan)

