

## Establishing reciprocal agreements for water and biodiversity conservation through a social marketing campaign in Quanda Watershed, Peru

Rodrigo Martinez\*<sup>1</sup>, Kevin M. Green<sup>1</sup> and Amielle DeWan<sup>1</sup>

<sup>1</sup> Rare, 1310 N Courthouse Rd, Ste 110, Arlington, VA 22201, USA

### SUMMARY

In the high Andean landscapes of northern Peru's Cajamarca San Ignacio province, Rare and C  ritas-Peru together launched a social marketing 'Pride' campaign, targeted at upstream farmers and downstream water users, to re-align upstream and downstream incentives and create a locally-governed water institution with directives to protect upstream forests. These institutions, locally called Reciprocal Water Agreements, are based heavily on local norms of reciprocity, whereby downstream users compensate upstream farmers for setting aside riparian forests for conservation and thereby protecting local species and environmental quality. Upstream farmers are compensated in the form of in-kind payments—a combination of economic alternatives such as provision of beekeeping equipment or fencing to keep cattle from encroaching riverbanks. The purpose of the Pride campaign, based on Rare's methods, was to generate local buy-in and accelerate the process of institution-building and adoption of Reciprocal Water Agreements. C  ritas-Peru and Rare staff collaborated to construct a theory of change and a series of methods have been employed to measure progress and impact. This campaign has led to the signing of 25 Reciprocal Water Agreement contracts, securing the protection of more than 360 hectares of forest.

### BACKGROUND

In the high Andean landscapes of northern Peru's Cajamarca San Ignacio province, the expansion of coffee production, cattle ranching, and timber trade increasingly threatens forest ecosystems and the environmental services, such as water quality and biodiversity conservation. Low agricultural productivity and economic development in the area exacerbate these problems and provide limited opportunities for more sustainable practices. In 2010, the international conservation organization Rare and the local non-profit C  ritas began partnering on a pilot project in the San Jose de Lourdes municipality in the Quanda micro-watershed to change local behaviours and protect these forest ecosystem services. The Quanda watershed in the Peruvian municipality of San Jose de Lourdes extends 7,017 hectares in total. It lies between the Alliance for Zero Extinction site Cordillera del Condor and Peru's Tabaconas-Namballe National Sanctuary. Its forests serve as a connecting corridor between these two sites. The predominant ecosystem type of the upper-watershed is tropical montane and pre-montane cloud forest (Holdridge 1996). Here 26 animals and 10 plants are found which are listed on the International Union for the Conservation of Nature Red List of Species, including two identified by the Alliance for Zero Extinction: the jocotoco antpitta *Grallaria ridgelyi* (IUCN, 2012) and Mara  n poison frog *Excidobates mysteriosus* (Aguirre 2011).

The main income generation activities in the area are coffee, plantain, and maize agriculture, as well as cattle ranching (Municipalidad Distrital de San Jose de Lourdes 2007). Other income comes from timber, predominantly *Cedro* and *Podocarpus* spp. The human population of the Quanda micro-watershed consists of immigrant "colonos" that have been settling in the area for the last 30 years. According to the San Jose de Lourdes municipality's development plan, formal land titling by the central government is weak in the area,

although informal documentation issued by the local authority is recognized by the local population (Aguirre 2011; Municipalidad Distrital de San Jose de Lourdes 2007).

The area provides valuable ecosystem services, including the supply of water to 800 families living in the upper watershed, as well as the citizens of the San Jose de Lourdes urban centers and vicinities. The quality of the downstream water supply depends directly on activities upstream, where high quality forest ecosystems and functioning water utilities can provide improved filtration, and reduced soil erosion and sedimentation (Postel and Thompson 2005). Although families living downstream use water for drinking, cooking and bathing, poor water and sewage utilities in the upper watershed have led to high incidences of parasitism and morbidity (Aguirre 2011).

Upper watershed deforestation for small-scale cattle ranching, conventional agriculture, coffee plantations, and timber extraction is predominantly responsible for reduced water quality in Quanda. These land-use practices reduce the available habitat for threatened species and exacerbate the existing pressures on biodiversity (Aguirre 2011). Because these activities are critical for income generation and other livelihood factors, prioritizing conservation in the upper-watershed has been a challenge. In addition, the local power utility, Central Hidroel  ctrica de Quanda, uses the Quanda water supply for electricity generation, producing around 12.5 megawatt hours per year to supply the power network composed by 40,600 connections in the urban centers of Jaen, San Ignacio, Bagua and Utcubamba. Observations have revealed that the quantity and regularity of water flowing into the Central Hidroel  ctrica de Quanda has been declining (Aguirre 2011).

The local office of the non-governmental organisation C  ritas del Per   has been working in the province of San Ignacio for several years on agricultural and sustainable livelihoods projects. In late 2007, C  ritas and the German development agency, Deutsche Gesellschaft f  r Internationale Zusammenarbeit, began promoting the benefits of payments for ecosystem services schemes for forest conservation and

\* To whom correspondence should be addressed: [martinezrodrigo1@gmail.com](mailto:martinezrodrigo1@gmail.com)

clean water provision. Informational workshops about best practices and lessons learned from other countries were conducted by *Cáritas* to raise awareness amongst local authorities and farmers and encourage the establishment of communal or private “conservation areas.” Despite initial interest, progress was slow. In 2009, the organization began a partnership with Rare to assist in creating local Reciprocal Water Agreements, based on the principles of payments of ecosystem services (Wunder 2007) but focused on local norms of reciprocity amongst upstream and downstream communities.

Rare is an international conservation organisation that partners with local organizations to deliver social marketing programs, called “Pride campaigns,” to encourage and enable behaviour change towards conservation. Pride campaigns have been applied to numerous environmental problems in addition to adoption of Reciprocal Water Agreements, including fisheries replenishment, shore bird conservation, and sustainable fuel wood use, amongst others.

## ACTION

Starting in 2009, *Cáritas* and Rare began working together to design and launch a Pride Campaign with the aim of setting up a Reciprocal Water Agreement institution in the San Jose de Lourdes municipality. Within a Reciprocal Water Agreements framework, upstream and downstream communities mutually agree on the hydrological ecosystem services that should be maintained, and the locally-led governance, incentives and monitoring systems to accomplish it. The institution that is created incentivizes upstream farmers to set aside areas of riparian forest for conservation or restoration by compensating them with in-kind payments for their improved land-use practices, in order that water users downstream can ultimately benefit from a regular supply of clean water.

Pride Campaigns activate communities by using targeted messages and marketing strategies to build local support and social networks, and to facilitate communication amongst key constituencies (Jenks *et al.* 2010) and, in this case, acceptance of the Reciprocal Water Agreements institution. The campaigns thereby provide communities with the social incentives to avoid environmentally damaging behaviour as well as the technical knowledge to make the change economically viable. This is accomplished through an extensive planning process that includes the formulation of a campaign theory of change. The high-level theory of change begins with the outcome, a conservation result, and then works backwards to identify the targeted threat reduction and behaviour change that is needed to achieve the desired result and, ultimately, the social marketing approach required to inspire and enable that change. The social marketing approach is comprised of specific targets to improve the knowledge, attitudes and interpersonal communication of the target audiences and to remove the technical, economic and other barriers to change. Table 4 shows the logical sequence of this Theory of Change, along with the overarching objectives of Reciprocal Water Agreement campaigns.

The implementation of a Pride Campaign depends on Rare’s training of a Campaign Manager, a local leader who, in the case of Reciprocal Water Agreements, assumes responsibility for leading delivery of the social marketing program, negotiating with farmers and community stakeholders, supporting the organizational structure of the

Reciprocal Water Agreement, and inspiring mayors and local governments to provide political and financial support.

Reducing threats to the Quanda watershed necessitated increasing local knowledge about the value of forests, overcoming citizen indifference about environmental problems and law evasion, and reducing unsustainable agricultural practices. The Pride Campaign therefore started with a situation analysis, researching the socioeconomic conditions of farmers and water users as well as the drivers of deforestation and land-use change. This analysis helped to identify the key players in the upper and lower watershed and the barriers to change. The *Cáritas* team subsequently segmented the audience and measured the existing knowledge, attitudes and practices in the community to establish a baseline. The Campaign Manager and team worked with Rare advisors to finalize SMART (Specific, Measurable, Action-oriented, Realistic and Time-bound) objectives along the campaign Theory of Change.

Implementation began with the awareness elements of the marketing campaign. Campaign marketing messages in the initial phase raised awareness of the importance of water and the relationship between forest, water and electricity. Importantly, the promotional materials also carried the message of the potential of Reciprocal Water Agreements and the benefits of the incentive mechanism. With slogans such as “Arriba Conservamos – Abajo Aportamos” (Upstream we conserve – Downstream we pay) and “Si luz para siempre quiero tener, el bosque y sus aguas debo proteger” (If I want to have electricity, I must protect the forest and its waters), the campaign was officially launched in early 2010. Some of the marketing materials used included billboards, posters, t-shirts and baseball caps. Local magazines and theatrical events were also used to deliver messages in locations such as schools, fairs, marketplaces and chapels. The most powerful marketing tool was probably the use of radio stations that broadcast soap operas related to the Reciprocal Water Agreements and water conservation. In addition, a folk song was specially written to encourage the upstream population to sign conservation agreements and downstream users to support a tariff on the electricity bill for watershed conservation.

With the help of the Pride Campaign, *Cáritas* established partnerships between upstream farmers, downstream water users, municipal authorities, and the hydropower companies of Electro SAC and Electro Norte. Three community radio stations and one television channel were also strategic partners in the creation of the Reciprocal Water Agreements institution. The campaign messages and effort of Rare prompted the mayors of San Ignacio and San Jose de Lourdes to create a municipal ordinance whereby water and electricity users pay an additional tariff for “environmental services” in their electricity bill. These resources go directly to the water fund, which is administered by a Watershed Management Committee created to look after the agreements, payments scheme and monitoring requirements of land use and conservation interventions.

The Campaign Manager and his team conducted sociological surveys to inform and plan campaign activities as well as to evaluate its impact on the knowledge, attitudes and practices of the target audiences. Target audiences were divided into landowners (upstream) and electricity users (downstream). Using a stratified random sampling design, sample sizes were estimated using a 95% confidence level: 276 landowners were surveyed in the pre-campaign and 275 in the post-campaign; and 452 electricity users were surveyed pre-campaign and 460 post-campaign. Surveys were also conducted amongst landowners and electricity users at a

comparison site that did not have a Pride campaign to assess the causal attribution of changes to the campaign itself. The surveys controlled for key demographic data, such as age and education, to ensure that data were comparable across treatment and comparison sites as well as over the period of the pre- and post-campaigns.

## CONSEQUENCES

**Knowledge:** Knowledge increased significantly for three of the four primary objectives for this campaign (Table 1). Understanding the role of the Reciprocal Water Agreements as a strategy for forest conservation was particularly effective (Table 1). Increases in knowledge at the control site (Figures 1 and 2) suggest that campaign messaging may have been received in the control area or other activities were improving knowledge as well.

**Attitude:** Although there was an increasing trend in attitudes towards landowners willing to sign up for Reciprocal Water Agreements, this was not statistically significant. However, shifting attitudes among electricity users willing to pay for ecosystem services did not show a trend (Figure 8, Table 2). But at the comparison site, attitudes towards Reciprocal Water Agreements amongst landowners declined significantly, indicating that campaign activities in San Jose de Lourdes were more positive than is reflected in the not significant increase of only 7.9 percentage points. However, these minimal shifts in attitudes did not prevent the success of establishing an environmental services fee or of accomplishing

initial Reciprocal Water Agreement contracts amongst landowners (25 to date). Given the strongly documented link between changes in attitudes and in behaviours (Andreassen 1995, Johansson and Henningsson 2011), it is likely that the experiences of the initial signatories, and the attitudes they express to their neighbours about those experiences, over the next couple of years will have a strong influence on the ability to significantly increase the number of landowners with positive attitudes toward Reciprocal Water Agreements. These observations are also likely to be true amongst the downstream electricity users, where the baseline at the campaign site was already relatively high and did not decrease significantly.

**Interpersonal communication:** One of the strongest leading indicators of behaviour change is interpersonal communication – individuals will often validate their new behaviour within their social network prior to adoption (Vaughan and Rogers 2000). For two of the four interpersonal communication objectives, campaign activities led to significant increases in discussions among participants (Table 3). Because of the intense focus of social marketing on increasing discussions about the benefits, it is perhaps not surprising to see much larger increases in measured communications at the campaign compared with the comparison site (Figures 9 and 10), even if there was contamination of other campaign materials. The insignificant increase in interpersonal communication (according to the objective) amongst downstream electricity users (Figure 10) indicates that an emphasis on this objective in future campaign activities is likely to be an important driver of success.

**Table 1.** The pre- and post-campaign survey measurements of four Knowledge objectives at the campaign site, including calculated percentage point change and significance test.

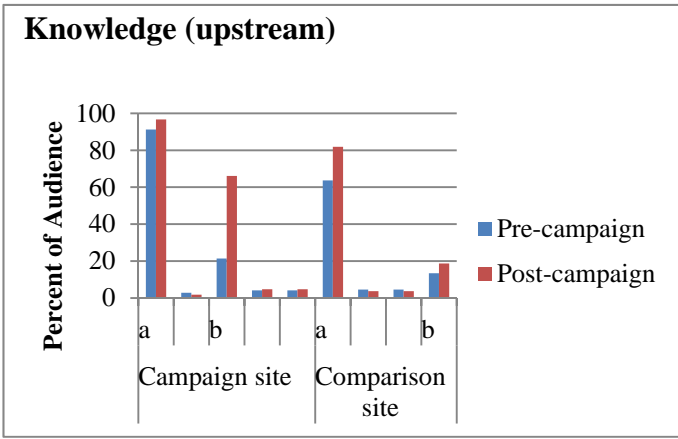
### Knowledge (campaign site)

	Pre-campaign	Post-campaign	Percentage point change	Significance (X2) at 95% conf. level
Percentage of landowners understanding the importance of conserving the forest and the production of electricity	91.2%	96.7%	5.5	No
Percentage of landowners understanding the ARA mechanism as a strategy for conserving the forest	21.4%	66.1%	44.7	Yes
Percentage of electricity users understanding the importance of conserving the forest and the production of electricity	75.7%	85.0%	9.3	Yes
Percentage of electricity users understanding the ARA mechanism as a strategy for conserving the forest	19.9%	31.8%	11.9	Yes

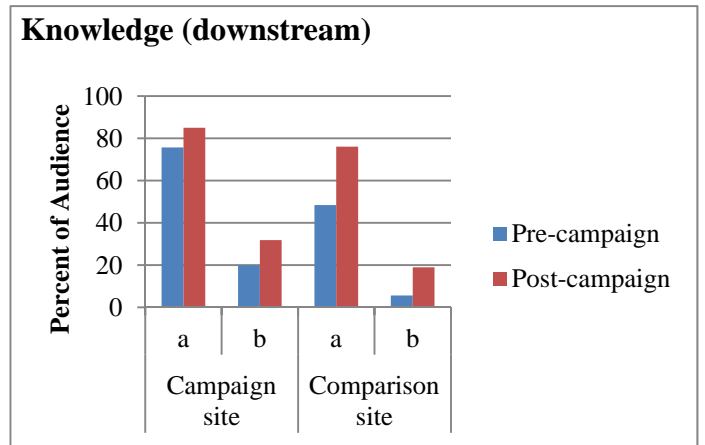
**Table 2.** The pre- and post-campaign survey measurements of four Knowledge objectives at the campaign site, including calculated percentage point change and significance test.

### Attitude (campaign site)

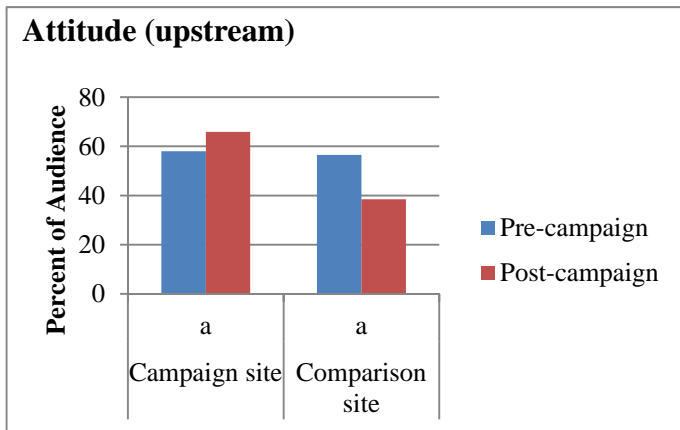
	Pre-campaign	Post-campaign	Percentage point change	Significance (X2) at 95% conf. level
Percentage of landowners who are willing to sign ARA contracts	58.0%	65.9%	7.9	No
Percentage of electricity users who are willing to pay extra to conserve the forest, in order to ensure the production of electricity	73.9%	68.1%	-5.8	No



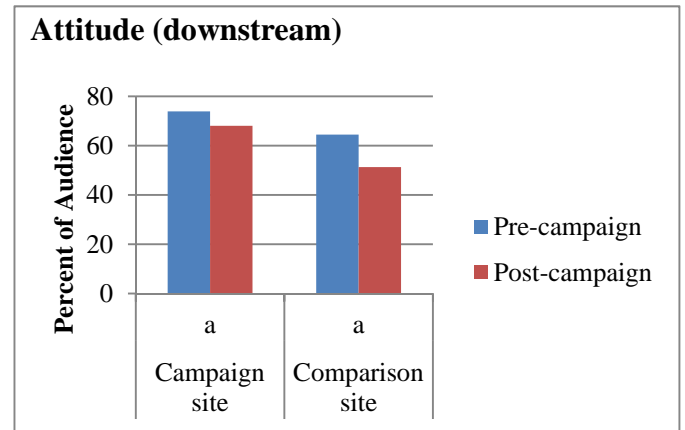
**Figure 1.** The pre- and post-campaign survey measurements of two Knowledge objectives for the upstream audiences at the campaign and comparison sites: (a) Percentage of landowners understanding the importance of conserving the forest and the production of electricity and (b) Percentage of landowners understanding the Reciprocal Water Agreement mechanism as a strategy for conserving the forest.



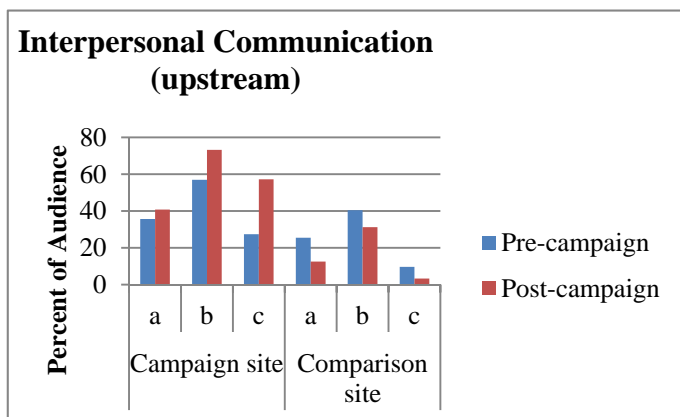
**Figure 2.** The pre- and post-campaign survey measurements of two Knowledge objectives for the downstream audiences at the campaign and comparison sites: (a) Percentage of electricity users understanding the importance of conserving the forest and the production of electricity and (b) Percentage of electricity users understanding the ARA mechanism as a strategy for conserving the forests.



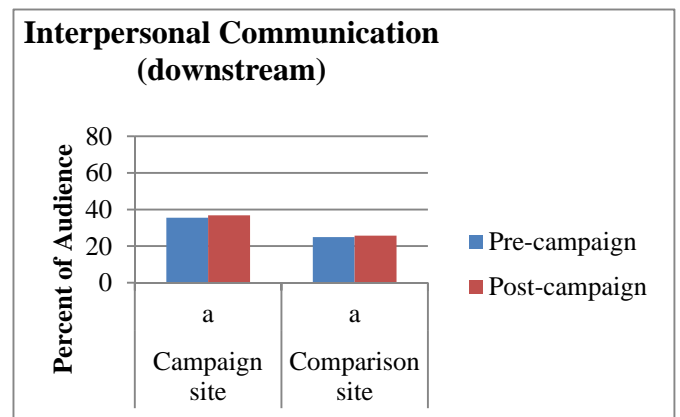
**Figure 3.** The pre- and post-campaign survey measurements of one Attitude objective for the upstream audiences at the campaign and comparison sites: (a) Percentage of landowners who are willing to sign Reciprocal Water Agreement contracts.



**Figure 4.** The pre- and post-campaign survey measurements of one Attitude objective for the downstream audiences at the campaign and comparison sites: (a) Percentage of electricity users who are willing to pay extra to conserve the forest, in order to ensure the production of electricity



**Figure 5.** The pre- and post-campaign survey measurements of 3 Interpersonal Communication objectives for the upstream audiences at the campaign and comparison sites: (a) Percentage of landowners who have, in the last 6 months, discussed environmentally friendly agricultural practices with others, (b) Percentage of landowners who have, in the last 6 months, discussed with others the importance of conserving the forest and (c) Percentage of landowners who have, in the last 6 months, discussed with others the benefits of a Reciprocal Water Agreement scheme.



**Figure 6.** The pre- and post-campaign survey measurements of 1 Interpersonal Communication objective for the downstream audiences at the campaign and comparison sites: (a) Percentage of who have, in the last 6 months, discussed with others the importance of conserving the forest for its relationship with the production of electricity.

(Table 3). Because of the intense focus of social marketing on increasing discussions about the benefits, it is perhaps not surprising to see much larger increases in measured communications at the campaign compared with the comparison site (Figures 9 and 10), even if there was contamination of other campaign materials. The insignificant increase in interpersonal communication (according to the objective) amongst downstream electricity users (Figure 10) indicates that an emphasis on this objective in future campaign activities is likely to be an important driver of success.

**Behaviour change, threat reduction and conservation result:** Preliminary indications are that the desired behaviour changes (Figure 1) are being achieved through the initial signing of 25 Reciprocal Water Agreement contracts amongst forest landowners that have to date protected 362 hectares of threatened forest habitat in the Quanda micro-watershed. The campaign initially targeted 500 hectares of forest, and the data indicate that there is significantly more willingness amongst landowners to increase the number of contracts, and thereby protected forest, in the coming years. As indicated above, and given that the behaviour is an entirely new amongst the audience, there is reason to believe that the rate of change of diffusion will continue to increase until a critical mass is reached. However, this will depend heavily on the experiences of the initial signatories and the attitudes which they communicate through their social networks (Rogers 2003).

These preliminary results suggest that a targeted behaviour change social marketing strategy can lead to quick adoption of Reciprocal Water Agreements in downstream communities, and protection of forest and riparian habitat in critical Andean ecosystems. Shifts in knowledge and interpersonal communication were particularly effective in connecting Reciprocal Water Agreements to forest protection as is demonstrated by this focus in messaging.

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**Table 3.** The pre- and post-campaign survey measurements of four Interpersonal Communication objectives at the campaign site, including calculated percentage point change and significance test.

	Interpersonal Communication			
	Pre-campaign	Post-campaign	Percentage point change	Significance (X <sup>2</sup> ) at 95% conf. level
Percentage of landowners who have, in the last 6 months, discussed environmentally friendly agricultural practices with others	35.7%	40.8%	5.1	No
Percentage of landowners who have, in the last 6 months, discussed with others the importance of conserving the forest	57.0%	73.2%	16.2	Yes
Percentage of landowners who have, in the last 6 months, discussed with others the benefits of an ARA scheme	27.4%	57.2%	29.8	Yes
Percentage of landowners who have, in the last 6 months, discussed with others the importance of conserving the forest for its relationship with the production of electricity	35.5%	36.8%	1.3	No

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