



# INSIDE STORIES

## on climate compatible development

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### Key messages

- *Watershared* agreements, which provide alternative development tools such as beehives, fruit tree seedlings and irrigation systems to upstream landowners, are a quick and low-cost route to forest conservation in upland watersheds.
- The agreements rely on local negotiations and consensus, avoiding the red tape associated with nationally funded conservation incentive schemes.
- *Watershared* agreements can address multiple objectives, for example economic development as well as forest conservation and climate change mitigation and adaptation.
- The agreements allow for the participation of poor people because formal land titles are not a requirement, and bureaucracy is low. Their flexibility means that participants can design and implement them to suit local needs rather than to comply with national policies and laws.
- Households and private sector enterprises, such as water user associations, irrigators and cattle ranchers, contribute to financing the programmes
- Public awareness campaigns can play an important part in securing the changes in behaviour and practices that are needed to make agreements work.
- One benefit of the agreements is that they have been proven to play a role in reducing local conflicts.

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## ***Watershared: Adaptation, mitigation, watershed protection and economic development in Latin America***

**Reciprocal watershed agreements – otherwise known as *Watershared* agreements – are simple, grassroots versions of incentive-based conservation that help upper watershed forest and land managers to sustainably manage their forest and water resources to benefit both themselves and downstream water users. *Watershared* agreements focus on changing behaviour through economic and non-economic incentives and building institutional capacity: in other words, on showing local authorities and water users that watershed protection is in their own interests, and then on helping to create the institutional framework needed to plan and implement it.**

The *Watershared* model was first developed in 2003, in the Bolivian village of Los Negros. Six downstream irrigators negotiated a ground-breaking deal with their upstream counterparts. “For every 10 hectares [ha] of forest you conserve for a year,” Andrés Rojas told Serafín Carrasco, “we will give you a beehive and training in how to produce honey.” And so the first reciprocal watershed agreement was struck. By 2016, an initial six farmers protecting 465 ha had mushroomed to 4,500 families conserving 210,000 ha.

### **Why *Watershared* agreements were developed**

The *Watershared* model developed as a way of side-stepping many of

the problems associated with both government and private Payment for Environmental Services (PES) schemes.

PES schemes are an increasingly popular tool to improve the management of ecosystems. Countries as far apart as Costa Rica and China have developed national PES schemes, through which individual landowners are paid by the state up to US\$60 per ha per year to leave their forests standing. Since 2003, Mexico alone has spent almost US\$480 m on paying land managers to adopt practices that maintain reliable water flows and sequester carbon. In such schemes, payments may take the form of economic incentives and subsidy

payments, cost-sharing arrangements, land-purchase deals, direct transfer payments, and subsidised public-private funds. Most of these national, government-led PES schemes focus on hydrological services either explicitly (e.g. China and Mexico) or implicitly (e.g. Costa Rica).

Small-scale private PES schemes have also been initiated over the past 15 years in places such as Heredia in Costa Rica's Central Valley and Pimampiro in Ecuador. Payments are made directly by one private entity to another to cover the purchase of land or development rights to land.

Despite intense academic focus on the PES model, by 2008 only about 30 private payments for watershed services programmes were active – i.e. had actually completed payments between entities – in all of Latin America. Fewer than 40,000 ha were under private PES contracts across the region. And only four countries (China, Costa Rica, Ecuador and Mexico) had national schemes.

Constraints included both demand-side limitations and a lack of supply-side know-how, the need for quantified baseline studies and calculations of conservation opportunity costs, the lack of clear property rights and/or enforcement regimes, and the relatively high opportunity costs of much of the land that is critical for conservation.

Crucially, government-led PES schemes can struggle to address sustainability challenges: achieving effectiveness, compliance, enforcement and cost efficiency in large programmes is difficult! National PES payments are often standardised and non-targeted, meaning landowners can choose which land



Carlos Calani, honey producer and *Watershared* participant.

parcel to enrol – land they might well have managed for ecosystem services even without the programme. Landowners across entire regions receive the same benefit, regardless of the environmental importance of their land. Moreover, top-down enforcement of forest protection in poor countries such as Ecuador can be costly and difficult.

### **How *Watershared* agreements work**

*Watershared* agreements do not rely on extensive hydrological and economic studies to define the correct payment levels. Nor do they focus on the opportunity cost of conservation as the primary driver of levels and types of compensation. Rather, they attempt to strengthen and formalise pro-conservation social norms, by publically recognising individuals who contribute to the common good by conserving their 'water factories'. They respond to one of the key findings of behavioural economic experiments, that "money . . . is the most expensive way to motivate people. Social norms

are not only cheaper, but often more effective as well".<sup>1</sup> *Watershared* 'compensations' are thus tokens of appreciation rather than economic transactions, and can comprise much lower amounts than neoclassical economic theory would predict.

In areas such as Bolivia's Los Negros valley, where the Andes meet the Amazon, extensive cattle grazing is the primary threat to forest cover and hence to the quality and quantity of downstream water. Cows enter forests, especially along riverbanks, to drink and graze. They defecate and urinate in streams, graze seedlings and compact soil; as a result, levels of faecal coliforms in the water increase, vegetation regeneration is reduced, and rainfall runs off compacted soils more rapidly. This leads to increases in flooding and sedimentation, and decreases in dry season water flows and water quality. As a result, agricultural production, incomes and quality of life decrease.

The original *Watershared* agreement in Los Negros<sup>2</sup> tried to reverse this vicious cycle. Upstream forests were protected

from cattle incursion by landowners such as Serafín Carrasco, who were compensated for their conservation efforts. Downstream water users, such as Andrés Rojas, provided Serafín with alternative development tools, such as beehives, fruit tree seedlings and irrigation tubes. Biodiversity was protected, water quality and quantity increased and livelihoods improved, both downstream (more/cleaner water) and upstream (landowners had new development alternatives). By 2016, 40 Bolivian municipalities had appropriated and adapted the *Watershared* model and had changed the behaviour of almost 200,000 people: 4,500 upstream farmers were conserving 210,000 ha of water-producing forest, and 195,000 downstream users were paying them approximately US\$500,000 a year to do so.

The model has been replicated remarkably quickly. In Bolivia, *Watershared* promoters first arrived in Cuevo municipality in March 2012. Less than 11 months later, the local government had committed to investing US\$2,289 and was signing its first *Watershared* deal with 54 families, who received 46 rolls of barbed wire and wire staples in exchange for signing contracts to conserve 1,905 ha of forest for three years. In San Ignacio, Peru, authorities created a fully functioning Watershed Management Department in the municipal government within three years, even though funding from a supporting local non-governmental organisation (NGO) came to an end.

While there have certainly been a few *Watershared* failures, local PES schemes have not yet shown themselves able to self-replicate and have the same rapid on-the-ground impacts as *Watershared* schemes.

The rapid success of low-cost *Watershared* schemes seems to have been because the agreements are perceived as a grassroots collaborative process for watershed management. This is in contrast to perceptions about the alternatives: centralised water pricing, the 'commodification' of natural resources, and PES as a taxable revenue stream for central government.

### **Learning from the *Watershared* agreements**

The major lessons learned implementing *Watershared* over the 15 years since the first schemes were implemented in 2003 are as follows.

#### **Local leadership and decentralised project design are key to *Watershared* delivery**

A number of characteristics of *Watershared* appear to promote efficiency, including the principle of subsidiarity. The schemes seem to work best when they are designed, managed and monitored locally, and are nested in and coordinated with relevant regional and national government policies.<sup>3</sup>

Indeed, *Watershared* rules are, by definition, developed locally. Local people were instrumental in originating the model and designing the first agreement.<sup>4</sup> The model requires and facilitates a local, long-term financial commitment to conservation: municipal governments and water users' associations must commit funds before the facilitating NGOs provide start-up funding. Given that a local financial commitment, requiring public money, is required for programme initiation, local officials take great interest in designing the schemes.<sup>5</sup> At new *Watershared* sites

in Bolivia, such as Cuevo, local finance comprises up to 90% of the water funds' capital, so the mayor's office has needed to be fully involved in the process. At the 10 pilot *Watershared* sites in Colombia, Ecuador and Peru, donors put very little cash into the water funds, so local institutions such as those in San Ignacio had to contribute.<sup>6</sup> This has increased the sense of local ownership and thus the potential for sustainability.

While the underlying philosophy of *Watershared* is the same everywhere – "people who produce water, share it; people who use water, share the benefits" – local details vary significantly. In Mairana, Bolivia, leaders decided to make strategic land purchases in addition to entering standard reciprocal watershed agreements. In Guasca, Colombia, landowners were asked to make voluntary commitments to land set-asides before engaging in discussions on compensation. Fundamental to the *Watershared* model is an inherent flexibility that allows local participants to design, adapt and refine programmes based on realities on the ground, rather than being bound by national policy or legal frameworks.

In Colombia, although the Roncesvalles reciprocal watershed agreement scheme depended on voluntary contributions, the Queremal and San Vicente schemes accessed municipal and other local funds. Interestingly, in Guasca, the regional government body responsible for conservation, the Corporación Autonomía Regional del Guavio, worked with municipal authorities to set up a fund that has great potential for sustainability: of the 1% of municipal incomes that legally must be allocated to upper watershed protection, the water

fund is guaranteed to receive 1%. It took almost three years of intensive effort to achieve this consensus and negotiate the legal maze that stood in its way, but the resources deployed were minimal compared with those used by previous donor-led projects.

Similarly in Peru, the Catholic charity Caritas-Jaen developed a *Watershared* scheme in which the San Ignacio government invested US\$28,000 to create a Watershed Management Division. More than 30 landowners are being compensated from a municipal water fund capitalised by municipal taxes (*arbitrios*).

### **Watershared focuses on changing social norms, not on meeting opportunity costs**

In a number of municipalities, such as Comarapa, Bolivia, and Guasca, Colombia, landowners changed their behaviour simply on the basis of what they learned during the *Watershared* development process – without any compensation. Changing the social

norms that affect conservation is the key to a successful reciprocal watershed agreement. *Watershared's* success, therefore, may be *because* the model sidesteps discussion about the service value and opportunity costs of conservation, rather than *in spite* of this.

In response to the question “What are the impacts of deforestation?”, more than 70% of respondents associated with *Watershared* schemes noted the deterioration of water quality and/or quantity and other changes in the hydrological cycle, while only 45% of respondents associated with local and national PES schemes made these connections. More than 10% of respondents linked to PES mentioned that deforestation had positive effects, whereas fewer than 2% of *Watershared* respondents did so.<sup>7</sup> This testifies to the awareness-building aspect of *Watershared*.

Indeed, many individuals and institutions assert that *Watershared*

has profoundly changed their perceptions of the role of forests in providing water. The mayor of Zumba, Ecuador, asserted, “people have changed their perception about water”. These changed perceptions not only facilitated the collection of downstream payments but also changed upstream behaviour, even before any incentives were paid.

### **Watershared investments are cheap and low risk**

The cost of protecting 1 ha of forest under a *Watershared* agreement is a fraction of the cost of alternatives. Ecuador’s national Sociobosque scheme pays up to US\$60 per ha, while Ecuadorian *Watershared* programmes in Cuenca and Loja cost around US\$20 per ha. In Bolivia, *Watershared* costs as little as US\$1.7 per ha. Most importantly, *Watershared* funds are sourced locally: by more than 40 independent institutions, or from hundreds of thousand of individual water users. Thus, unlike national PES schemes

## **Box 1. A sweetener for forest conservation**

Carlos Calani Perez left Bolivia’s high Altiplano 20 years ago, to settle in the foothills of the Andes, near one of the most biodiverse protected areas of the planet: the Amboró National Park. Carlos moved to the lowlands in pursuit of a better life. “Everything you plant on this land, produces,” he says, gesturing to the surrounding citrus groves.

Carlos lives upstream from the town of El Torno, in the community of Villa Paraíso, along with his wife, Teodosia, and his five children. Under El Torno’s *Watershared* programme, the Calani family receives economic benefits in exchange for conserving primary forest and using agricultural practices that protect the local watershed. In 2012 they received four beehives to house a stingless native bee species, called *señoritas*, to produce medicinal honey and pollen. Carlos now has 20 beehives, from which he produces and sells honey at El Torno’s market. Each hive produces 1 kg of honey per harvest. Carlos can usually harvest two or three times a year, and the medicinal properties of the honey command a high price: up to US\$30 per kg. Honey production has become very important for the Calani family, earning them approximately US\$1,200 a year, a third of their annual income. Teodosia and her younger children take care of the hives, which are neatly installed in a grove of tangerine trees.

The development impacts of forest and watershed conservation don’t end there. The Calani family have also received support from downstream water users to build a two-room brick house. After many years of living in a small shack with adobe walls and a palm roof, their new home is nearly ready. “We are grateful for this new house that we have earned in return for protecting our forests,” says Teodosia.

that are funded from the general treasury, *Watershared* spreads risk and is less susceptible to political and macroeconomic volatility.

***Watershared* primarily works to reduce conflicts and bureaucracy**

The first *Watershared* agreement in Los Negros was born out of conflict. Downstream water users had long complained that upstream deforestation was reducing the overall flow in the Los Negros River. This disagreement boiled over when Los Negros irrigators, armed with sticks, travelled upstream to confront their neighbours. Ten years later the same irrigators were contributing around US\$3,000 a year to help the upstreamers they had attacked to protect 3,000 ha of forest 'water factories'.

In Cuenca, Ecuador, the city water provider, Empresa de Telecomunicaciones, Agua Potable, Alcantarillado y saneamiento de Cuenca (ETAPA), had for decades been working to protect the upper Yanuncay watershed. However, in upstream Soldados, villagers were viscerally opposed to ETAPA, going as far as to kidnap company staff. Downstream, demand was exceeding supply in the dry season but city users were wasting water. A two-pronged public awareness campaign called Pride for Reciprocal Watershed Agreements was able to calm tensions upstream and promote a 'shorter showers' initiative downstream, thereby resolving both of ETAPA's major problems in one go. With the conflicts resolved, and a clear local mechanism of cooperation visible to all, ETAPA was then able to contract 22 *Watershared* agreements in the middle watershed, putting 1,341 ha under conservation.



Signing a *Watershared* agreement in El Torno Municipality.

Clearly, because it is a cooperative community-based process, *Watershared* can help resolve conflicts. Indeed, the *Watershared* message – that everyone in a watershed is part of the same problem and so can be part of the same solution – is in itself a low-cost, local mechanism for conflict resolution.

***Watershared's* success comes from rapidly piloting a programme to see what works, then refining and improving it**

The rapid development of Sociobosque in Ecuador (and the very slow development of PES laws in Peru and Colombia) suggests that it may be better to undertake a simple priority-setting exercise to kick-start a conservation incentive programme, then refine and improve the approach once a pilot project has been implemented: in other words, minimise bureaucracy to get schemes up and running, then learn from experience.

This lesson is especially stark when it comes to deciding how many studies need to be done before an incentive scheme gets up and running. In contrast to most PES schemes, *Watershared* agreements do not depend on data to drive their design: instead, they are usually initiated before scientific certainty is reached. The *Watershared* approach is to reduce bureaucracy and to design and pilot schemes using the precautionary principle.

***Watershared* has been possible despite unclear land rights**

Land tenure arrangements are highly informal in much of the Andes. Few landowners have government-approved titles, but rather rely on signed purchase contracts, some of which are generations old, as proof of possession. In general, PES schemes, especially government schemes such as those in Costa Rica and Ecuador, do not accept these informal 'titles'. Many, often the poorest, landowners therefore cannot enter the schemes.<sup>8</sup>

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The achievements of *Watershared* schemes are absolutely admirable. One of the challenges faced relates to how the priority areas for this scheme are selected and also to their financial and technical sustainability. As detailed here, the foremost criterion for selecting *Watershared* scheme areas are areas where social change is possible, not necessarily areas of greatest strategic importance for priority for forest conservation or climate change adaptation. What's more, some external funding is required, which may not always be on offer from local governments. That said, the results demonstrate the important contribution of *Watershared* schemes to climate compatible development."

– Maria Jose Pacha, CDKN Latin America

In contrast, reciprocal watershed agreements do not require formal land titles but instead rely on locally accepted definitions of who owns and controls, or grants access to, watershed forests. In Bolivia, tenure is confirmed and agreements are signed on the basis of simple assurances from neighbours and the village chief that a piece of land belongs to an individual. *Watershared* ownership decisions are thus based on local consensus, and although such tenure does not necessarily have *de jure* recognition, the *de facto* definition of boundaries used by participants in the *Watershared* scheme is often stronger.

## Conclusions

By paying to ensure their own water supplies – and in so doing adapting to climate change – downstream participants in both PES and reciprocal watershed agreement schemes like *Watershared* are simultaneously financing climate

change mitigation (through forest conservation) and supporting their own economic development (by reducing agricultural and drinking water shortages). Both types of incentive-based conservation thus lead to climate compatible development.<sup>9</sup>

*Watershared* targets municipalities where the majority of inhabitants are rural, poor and minimally educated. Given that this type of municipality is common in Latin America, it is perhaps to be expected that *Watershared* should expand more rapidly than PES: in Bolivia alone, from six farmers, 465 ha, one downstream town and no local investment in 2003, to 4,500 upstream farmers, 210,000 ha, 40 towns and 195,000 paying water users just 12 years later.

One of the defining characteristics of both local private PES and *Watershared* schemes is that they are based on the notion that local water

users should help to pay for activities that ensure the provision of their water. In short, water users should invest their own money in upstream conservation. In most *Watershared* agreements, the extra cost is itemised on users' water bills.

*Watershared* is working across 80 Andean municipalities, with the model increasingly accepted across Latin America. The conservation organisation Rare, for example, has taken the *Watershared* model to Colombia, where it is now used across the Department of Valle de Cauca. Similarly, in Southern Ecuador, the FORAGUA water fund – an alliance of more than 30 municipalities – is incorporating reciprocal watershed agreements into its watershed conservation approaches. *Watershared* is currently around 70% self funded, with resources coming primarily from local governments and water users. This bodes well for long-term sustainability.

The funding of national PES schemes, in contrast, requires a long-term political commitment. Dependence on central treasury support may be risky given the historical lack of lasting financial commitments to conservation in most developing countries. The direct link between water users and water providers in private PES and *Watershared* schemes may be less risky than the indirect links of national programmes. Further, once forests are protected using local water financing, there may be potential to raise additional funding (to protect more forests, or to increase the rate of compensation on already conserved lands) through payments for carbon sequestration from national or international investors.



Watershed agreements allow upstream landowners to protect the water sources upon which downstream users depend.

## Endnotes

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