



## **Innovation in Conservation** **The case of Paraguay's Atlantic forests**

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## **INNOVATION IN CONSERVATION: THE CASE OF PARAGUAY'S ATLANTIC FORESTS**

*Sarah Hutchison<sup>1</sup> reports from her visit to Paraguay (April 2008).*

The land-locked country of Paraguay is probably among the less well-known parts of Latin America. Some of us may know that 35 years of military dictatorship only ended there in 1989 and that it has struggled with high levels of corruption. It is also a country of great inequality, and one of the poorest in Latin America with over 30% of the population living below the poverty line. It may therefore come as a surprise that it is at the forefront of innovation in terms of conservation. Paraguay is becoming a world leader in maintaining and restoring the little of its remaining forests.

The Atlantic forests stretch from the Atlantic coast of Brazil into Paraguay and also Argentina. In Paraguay they are humid and semi-humid sub-tropical forests with a high diversity of species, many of which are unique to these forests. In some of the larger remnants of forest, big cats (such as jaguars, pumas and ocelots) and large birds (such as the bell bird and harpy eagle) can still be found. There are also a large variety of toucans, an incredible diversity of colourful amphibians, and reptiles like the green anaconda and the broad snout caiman.

These Atlantic forests covered 33% of the eastern part of Paraguay in 1984. In just 20 years, this amount fell to 13%. Cattle ranching and then the soya boom, driven by land reforms which handed over significant areas of forests to farmers, have contributed to this significant loss.

### **Introducing a Tradable Development Rights Mechanism**

In 2004, the Attorney General's Office in Paraguay (Fiscalia) approached the WWF Paraguay team with the idea of initiating a Tradable Development Rights Mechanism (TDRM). TDRMs had already been used by the conservation community in other countries to adapt market-based tradable permit systems to the context of land conservation. In such a mechanism, a farmer who has deforested his land in a non-priority conservation area is allowed to continue developing all of his land by purchasing conservation rights from forest owners in priority conservations areas.

The TDRM mechanism had the potential to generate huge benefits for biodiversity, by protecting existing forest and creating corridors of regenerating forests along watercourses and between forest blocks. These corridors can aid the movement of large-ranging species such as puma and ocelot, and also help species affected by climate change move across the landscape as conditions change.

No one at that point knew if, or how exactly, such a mechanism would work in Paraguay but it set in motion an intensive process of talks and consultations to establish whether it would be possible to create a system of incentives that would reward forest conservation and restoration as well as penalise deforestation.

By this time, the WWF Network and its partner organisations were in the process of defining a biodiversity vision for the Atlantic forests – a tool that contributes to the land-use planning of key ecoregions. This vision presented a diagnosis of the current situation and proposed a set of actions to be implemented for the conservation of the remaining forest.

Like in many Latin American countries, Paraguay's environmental laws look very good on paper. The forest law states that landowners of more than 20ha in forested areas should retain 25% of their land as forest, as well as keep 100m of forest along each side of rivers and

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streams. In reality, although established in 1973, this law has only ever been sporadically applied, and in many places forests were cut and burnt almost in their entirety.

To be able to implement a TDRM or any other solution to this problem, the first step had to be to start applying the law systematically. With the use of satellite images, land tenure maps and Geographical Information Systems (GIS) technology, it was possible to see exactly who retained the required forest cover and who did not. In other words, who was in 'forest debt' and who was in 'forest credit'.



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However, applying the law across the country at the same time was an impossible task. "If the law was applied everywhere, 330,000 people would have to be imprisoned," explained WWF-Paraguay advisor, Calixto Saguier (pictured, left), with a smile. Saguier's charisma, determination and political savviness have been crucial in the progress made to date.

Another factor which limits the application of the law is the fact that a land register – a crucial tool for linking satellite images of forest cover to the actual landowners – only exists in two of the country's regions: Itapua and Alto Parana. These regions, which are very different both socially and economically, were therefore chosen as pilot regions.

## How the TDRM works

The introduction of the TDRM into a particular area starts by a process of communication, involving a public meeting with the municipal authorities, the Attorney General for the Environment, the National Forestry Service and the Secretariat of the Environment.

Landowners are then given the opportunity to sign up to have their situation assessed by the Attorney General's office. They then agree to correct any forest deficits they have and comply with the law. This commitment is made in a legal setting, in the presence of the Environment Attorney, the local attorney, and legal representatives of the Environment Ministry and the National Forest Service. A notary is also present.

If a landowner does not have the approved 25% of forest reserve on their property there are a number of options open to them:

- re-forest or allow natural regeneration on an area equivalent to their forest debt
- purchase forested land equivalent to the debt
- enter into the TDRM. Through the TDRM a farmer can meet his legal obligation by entering into a legal agreement with another landowner who can supply the forest coverage required. This could be provided by the other landowner reforesting an area of their property, or by protecting existing forest. To support this relationship Paraguay also has the Payment for Environmental Services Law that was passed in November 2006. A multidisciplinary group has assessed how much money landowners with forest should receive for the environmental services they provide. This group established a guideline payment of US\$100-180 for every hectare, every year. However, the exact nature of the agreement is decided by the two landowners.

For those that refuse to sign up to have their situation assessed, the Attorney General begins the penal process and infractors can expect to be fined and imprisoned. The time spent in prison will depend on the severity of the environmental damage caused. One of the shortfalls in the legal system is that the landowners have a five-year opportunity within which to start complying with the law, which means that they can find ways of delaying the process if they want to.

There is one other key part to the TDRM – the Zero Deforestation Law – which has closed legal loopholes which would otherwise have allowed continued deforestation. Without this law in place, landowners could have destroyed forests if more than 25% of their land was forested or they owned less than 20ha of land. In 2004 this law was introduced for a period of two years and was later extended until December 2008. There are still many cases of the law being flaunted, but in 2005-2006 the rate of deforestation in Paraguay's Atlantic forest dropped by an incredible 85%. The following year, fires unfortunately meant that forest was lost, but in general the law continues to dramatically slow deforestation.<sup>2</sup>

### **Seeing TDRM at first hand**

I arrived in Asuncion, the capital of Paraguay, in April. A trip like this is essential for a non-Paraguayan like me to understand the legal intricacies of what the TDRM is all about. With the start of the rain season long overdue, the landscape was parched and the truck we used to reach the pilot sites kicked up clouds of red dust in its trail.

All the hard lessons have been learnt in the region of Pirapo. This region has a large population of Japanese decent. They started working the land 47 years ago, and at the time received governmental credits to deforest. Now only scattered patches of forest remain amongst fields of corn, soya and pasture. Of the 690 farms, 168 have signed up to comply with the law and 38 are now actively reforesting on their lands or entering into agreement with others for them to reforest. The restoration in this area of forest reserve and the water courses of the Atlantic forest translates into 8,435ha of reforestation. The municipal mayor, Yoshio Kudo, was very clear about what needed to happen next: "Now people have to be jailed for non-compliance. This is the only way that the law will be respected." The Attorney General is now assessing the 10 properties with the largest forest deficit that have not signed up to the TDRM.

One of the most crucial lessons learnt from Pirapo was the need for every government agency involved to have a common message and act in a coordinated fashion. The Attorney General's office, the National Forestry Service, the Secretary of the Environment and the municipality all have a role to play in the process. Initially, however, the agencies were working independently and interpreting the law in their own way.

The Director of the Environmental Unit of the Attorney General, Dr Ricardo Merlo, was very clear on the impact that the TDRM has had on his institution: "Before this process started there was no hierarchical structure within the Environmental Attorney's office. Now prosecutors are organised around watersheds, with a national supervisor. It gave the ministry a new vision of work in coordination with the other agencies. We now have a line of work, a methodology, established processes and indicators resulting in better results, where before there were none of these things. It was a sea-change in public ministry thinking."

It hit home to me then that this project has catalysed a major turning point in the application of the environmental laws in Paraguay.

What of those that have taken up the scheme in Pirapo? Kozo Koda (pictured, right) is a professional agriculturalist and among the first to have his land assessed. He had not maintained forest along the river that runs through his land and was very aware that, as a professional, he needed to lead by example. He had purchased his farm from another producer, who had not looked after the soil. It has taken him 20 years to start to recover better soil condition and he has put in place several practices that help prevent erosion.



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**2** Paraguay has recently announced a further five-year extension to the law to provide the necessary time to get the financial mechanism and economic alternatives in place that will help to counter deforestation.

Recognising that forests along the rivers helps prevent soil being washed away, he has fenced off 13ha of the river banks and allowed natural re-growth to take its course, as well as planting some commercially important tree species. The results are already visible, with shrubby vegetation and saplings of around 2m high.

But the setting aside of land can have a large economic impact for the farmers, because the price of soya and other grains are at an all-time high. An average hectare of land can produce 3,000-4,000kg of soya, which sells for US\$0.32 per kg. This could mean reductions in farmers' income – which is one of the challenges of conforming to this forest law.

## **Visionary thinking**

The municipality of Alto Vera is the poorest of the four pilot sites chosen. The San Rafael Park takes up almost 60% of its area, and therefore the municipality's funding comes from the taxes paid on the remaining 40% of lands. However, what it lacks in financial resources it makes up for in sheer enthusiasm and dedication. A very young mayoress, Angelica Aquino, met us with two of her equally young environmental promoters. As is the ritual in Paraguay, the native tea yerba mate was passed around in the guampa (the cup and metal drinking apparatus used for yerba mate). With great pride they explained the work they are doing to build local capacity to control forest fires, provide environmental education and reforest. One of their short-term dreams is to have the country's first ever indigenous forest fire-fighting brigade (something told me from their look of determination that this dream will soon become reality).

For the TDRM to be a success, a constant supply of native saplings of many species is required for the reforestation efforts. The WWF Network and a local NGO, Pro Cosara, have built a tree nursery in Alto Vera which is producing 25 native tree species – more than any other nursery in the region.

The nursery (pictured, right) plans to be self-financing very soon from the sale of the plants, but 10% of the production will always go to the municipality so that they can donate saplings to schools and other groups that cannot afford to buy them.

When the Attorney General's office instigated one of the first fines of its type for infringement of the forest law, the revenue was given to one of the WWF Network's partner NGOs, Fundacion Moises Bertoni. These funds have financed the replanting in 150 ha of land belonging to 31 families in a very poor but important part of the Pirapo watershed, the Libertad del Sur. It has been one of the first indications that things can be different in the future.



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We later discussed the example of Alto Vera with Fidel Ojeda, the mayor of Santa Rita, one of Paraguay's wealthiest municipalities. Here the soya boom has really taken hold. This can be seen by the depletion of the forests to make way for farming land. Here the majority of the landowners are infringing the law and are in 'forest debt'. Despite the welcome economic progress that the area has enjoyed as a result of soya, Ojeda wanted the TDRM for his municipality because of the negative impact on water and climate from the loss of forests in the region. The mechanism was launched in April 2008.



WWF has been providing the GIS training necessary to assess forest cover, property by property. And our meeting included the handing over of a computer on loan to the municipality (pictured, left) which will ensure that the municipality has the in-house capacity to implement and monitor the TDRM.

### **The impact of soya farming**

The success of soya farming in Santa Rita has impacted badly on the Ache indigenous communities. Once the guardians of large expanses of forest, the Ache now have legal rights to relatively small areas. Traditionally hunter-gatherers, they still use their traditional bows and arrows to hunt but there is little to be found in their limited forest due to competition from other hunters.

In the Ache community of Ypeti mi, their communal forest of 1000ha is now completely surrounded by soya farms. The community is constantly being invaded by surrounding mestizo<sup>3</sup> groups that have long cleared their own forests. Now they observe with much pain the deterioration of the next closest forest block, the Caazapa National Park, which was once part of their ancestral ground and is now being degraded.

“We want an opportunity to help manage the reserve properly,” explained their young Cacique (chieftain), Teresa Wachugi (pictured, right).



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With sadness in her eyes, she explains how their main challenge is the lack of clean water. They are forced to drink muddy water from the stream or the well, which sometimes dries up completely. Five people died with bloody diarrhoea the previous week. The streams they drink from run through soya fields that are intensively sprayed with agrochemicals. I asked if the water had been checked to see if chemicals present were at safe levels – maybe this would help to hold those responsible to account.

WWF-Paraguay employee, Angel Brusquetti seemed doubtful that it would make a difference to have this information: “There are many such denouncements made and none are acted upon.”

At present the forest does not provide this community with any income. The little money they have comes from communal agriculture, which is insufficient to meet the full needs of the community. The TDRM provides some hope that at least some of the soya farmers in Santa Rita will start to pay the Ache for the continued protection of their forests.

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<sup>3</sup> people of mixed European (Spaniard) and Amerindian ancestry living in the region of Latin America

## Conservation on small farms

The Ache can benefit from the TDRM because they own the legal rights to 1,600ha of land. However, because the TDRM only applies to properties over 20ha, many of the smallest landowners cannot participate. Trying to maintain forest cover on small properties that also aim to practise subsistence agriculture is a challenge but small farmers are also aware of their need for firewood – which is still the only source of energy for cooking in most of the region.

The WWF Network and its partners have to employ different mechanisms for encouraging forest conservation and regeneration on these small farms. One of the priority areas that has been identified as an important green corridor is the community of Corazon de María, an area between two protected areas – the National Park Caazapa and the Private Reserve Tapyta. The aim is to establish biological corridors of woodland that allow species to move from one area to the other.

However, our work here is not just about forest regeneration. It is about supporting 150 families to improve the integrated management of their plots and diversify their sources of income. This is work that requires patience and long-term commitments, where trust has to be gradually built with the communities and progress made plot by plot.

## Innovative partners

Fighting forest crime is something that requires a united front. The WWF Network works with some inspirational partners. The NGO, Pro Cosara – Pro Cordillera San Rafael, is a partner that works to conserve the San Rafael protected area. It employs park guards and also patrols the San Rafael protected area from the air, in an ultra-light plane. Death threats are not uncommon and recently one of the directors was shot at. “If they think that this is going to deter me, then they are wrong,” said Director, Christina Hostetler (pictured, below). In the plane’s hanger she showed me how they have stockpiled emergency supplies for when fire outbreaks happen, and explained the training process they provide for volunteer and paid fire-fighters.



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The NGO Guyra Paraguay, which means Birds of Paraguay in the Guaraní language, is an organisation that works to protect biodiversity, especially of birds and their habitats. Guyra is supporting the WWF Network with TDRM communication and education activities in the pilot areas. Radio broadcasts, posters and videos (in Guaraní and Spanish) are being used to get key messages across. The TDRM is not perhaps the easiest of concepts to communicate, but understanding the mechanism and the legal context is imperative to its success. The Guyra team is disseminating information on the TDRM methodology and its significance to every town in the regions of Itapúa, Caazapa and Alto Parana.

The Moises Bertoni Foundation, set up to promote sustainable development through nature conservation and active public participation, is no stranger to innovation. It established the first conservation trust fund in Paraguay in 1996. Its new goal is to build on the success of the ‘zero deforestation’ campaigns (where public awareness of Atlantic forests rose from 5% to 55% in two years) and give society a way of actually getting involved in the conservation of the Atlantic forests, through a fundraising drive aimed at direct debits from credit cards. Social awareness and engagement in conservation challenges is vital for progress and also helps combat corruption. “What is the point of having a really successful project in a failed society,” questions Jan Speranza, the Director of Fundacion Moises Bertoni. The funds raised will help finance the reforestation in the Corazon de María corridor.

The community now has a tree nursery and last year it generated important extra funds for the 12 families involved in its management. A group of 20 women are bee farming, and medicinal plants are being produced for sale. Improved management in the protected areas is already having some encouraging results. Puma and ocelot footprints have been recorded for the first time in four years.

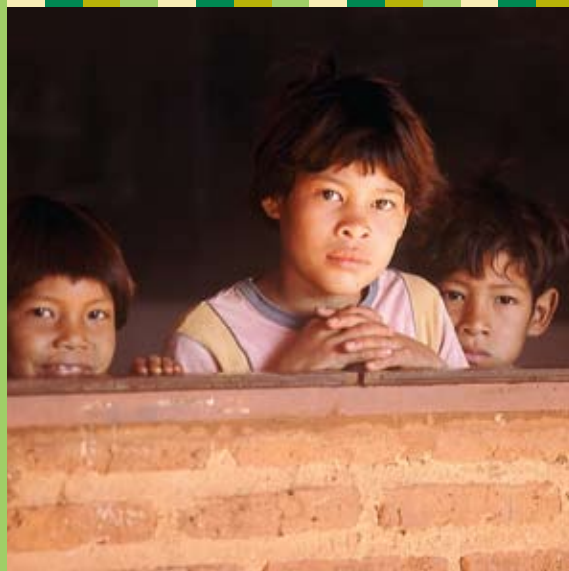
### **The challenges ahead**

The TDRM still has a long way to go to be a fully functioning mechanism, providing benefits for some of Paraguay's poorest people. But what is certain is that without it, and all the hard work invested by so many into applying the forest law and establishing the Zero Deforestation Law, Paraguay's Atlantic forests would face a bleak future.

Continued efforts by the authorities and society are now required to overcome corruption and short-term economic gain. One hopeful sign is the new Payments for Environmental Services law which will provide other mechanisms for conferring a value on the Atlantic forests for the goods and services they provide. Without such innovation and dedication, the incredible biodiversity would be lost and the effects of climate change would be even worse.

Brusquetti summed it up: "If we don't change the situation within 10 years every last remnant of Atlantic forest will disappear."





The mission of WWF is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by

- conserving the world's biological diversity
- ensuring that the use of renewable natural resources is sustainable
- reducing pollution and wasteful consumption



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