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From Hunter to Conservationist: Carlos Solana, a Pioneering, Visionary Farmer Living in the Highland Forests of Costa Rica



FIGURE 1 Carlos Solana and his son proudly showing a trout produced on their own farm in Alto Jaular, Costa Rica. (Photo courtesy of CATIE)

Carlos Solano interviewed by Xinia Aguilar Ramirez

We must try to live in harmony with nature. We should really think through our attitudes about nature, and what we are taking from her, so that we don't destroy her at the first touch.

Carlos Solano, now 46 years old, lives in El Jaular, an area rich in plant and animal life and situated at 2600 masl within the Cerro de la Muerte sector of the Talamanca Mountain Range in Costa Rica. The Talamanca Range traverses nearly half the country and contains most of the highlands and primary forests found in Costa Rica. Talamanca forms part of La Amistad Biosphere Reserve, which is one of the country's most biodiverse areas.

A scant 10 years ago, Carlos hunted and plundered in the forest, like most of his neighbors, but this has since changed for good. Now he and other businessmen interested in conserving these forests belong to the Estación Biológica Cuericí (Cuericí Biological Station), a lodge established for foreign students who want to learn about and study highland forests. Carlos has also become a prominent breeder of trout fingerlings (young fish bred to stock rivers and lakes) and his children cultivate blackberries for domestic consumption and export. His serious and responsible commitment to conserving nature sets an example worth emulating.

Enter “man,” and with him, deforestation

About 40 years ago, Carlos Solano's grandfather arrived in El Jaular, spurred by the dream of acquiring farmland. His brother-in-law was already “making a farm” in the area and suggested that he come too (“making a farm” was an expression used, until recently, by peasant farmers to indicate the clearing of forested land to begin farming it). However, access was extremely difficult and the area was cut off from all forms of communication, which forced the colonizers to walk long distances to reach the lands they had homesteaded. As Carlos recalls,

In my grandparents' time, you had to walk forever because there was no road. The people who colonized these parts came from places close by and they didn't care about having easier access to the Inter-American Highway (the main road leading to the border with Panama). Because my grandfather was from Los Santos, which is far away on the other side of the mountains, he cut a trail through the forest to shorten the distance. That path soon became a road that led out to the highway.

As elsewhere in the world, the advent of colonization brought with it deforestation, and the forest was cut down to establish farms. This area was hit hard. Carlos remembers that

Most of these lands were progressively cleared of shrubs and small trees, leaving only a few large trees, but none of what was cut was taken advantage of. It was all just cut down to plant lima beans, potatoes, carrots, and crops in general. There were small patches of forest surrounding the farm because, at the time, it didn't matter if fires burned large tracts of forest. In fact, windy days were used to burn the forest for several farms. There were no limits to hunting; if an animal was on a neighbor's land, anyone could go in and kill it.

Logging and hunting ... times past

When asked about his family's first arrival in the area and the changes that have since taken place, Carlos recalls,

I came to the area because of my grandparents. I remember that they carried me patiently along the trail, and I loved it. ... As time passed, I used to come up here with my father to work, logging and making charcoal in La Trinidad. Years later, I met Mayela, my wife, and we have lived here, in El Jaular, for 26 years now.

However, in those days, Carlos's interests were a far cry from the conservation of nature.

They had already opened the tractor trail, and I would come to cut oak timber to sell at La Chonta, one of the sawmills in the

area, to make railroad ties and fence posts.

Because there were so few opportunities for making a living, the amount of hunting increased dramatically.

I'd kill anything that moved. We'd kill a tapir, a wild goat, or a pecari, and we'd divide it up among several families.

The same was true for logging to extract timber and charcoal. But government laws soon prohibited unlimited logging and established jail sentences for those who chose to ignore them.

Forestry law endangers survival

Prompted by the massive deforestation ravaging the country at the time, the first National Forestry Law was passed in 1969, with the goal of regulating logging. This law negatively affected the already weak and sluggish socioeconomic development in the region. The local people soon began to view State institutions, particularly the Forestry Department (now known as the Ministry of the Environment and Energy, MINAE) as their sworn enemies. These institutions were forbidding them to do what they needed to do to provide for their families and ensure their own survival. Carlos asserts that

We were used to living off the land, and then suddenly there was this law that completely prohibited all our normal activities and said that if we didn't obey, we'd go to jail. The change was like night and day, and so, of course, the farmers reacted violently.

Many people had no alternative income and were forced to emigrate from the area. Later, when the Rio Macho and Los Santos Forestry Reserves were created, in 1964 and 1975, respectively, small farms in the region were expropriated, aggravating the situation. The already low population density was further reduced, with negative impacts on rural development.

An encouraging project

Despite all the discord precipitated by government efforts to conserve the high-

land forests, in 1984, CATIE (The Tropical Agriculture Research and Higher Education Center in Turrialba, Costa Rica) began the Natural Forest Silviculture Project in conjunction with MINAE. The project was financed by the Swiss Agency for Development and Cooperation. Its main objective was to evaluate the potential for sustainable highland forest management.

To achieve its objective, the project began to study the forest's natural ecological processes for the first few years. Based on observations during this period, forest harvesting activities were developed, logging roads were opened, and the impact of these activities and the forest's response to them were monitored. The local people began to protest these actions because, from their point of view, the project appeared to be doing exactly what they had been prohibited from doing. The people demanded more information and a chance to participate in the silvicultural activities. Consequently, the project and the local inhabitants decided to found a forestry committee to act as a link between governmental institutions and the communities in the Cerro de la Muerte region. Carlos Solano is the president of this committee.

The project has been working in the area for 15 years, and its work has been well received. A friendly atmosphere exists between the technicians and the local people.

I tell the CATIE technicians that I think the research they're doing is good because it is going to provide the people who live near the project area with more information about wood and its uses, about organization, and about how to get a forestry permit to cut a tree. They can also get information about other projects that can benefit their families so that we won't have to cut down trees anymore in order to survive. This way we can have tourism, ecotourism, research sites, blackberry projects, organic agriculture, and other alternatives, making it possible for a family to live in this area without having to cut down the forest.

Learning to value the forest

Carlos Solano's attitude about natural resource conservation developed from his



FIGURE 2 Not all farmers benefit from sustainable management of mountain forests. Some still use slash-and-burn for agricultural production as it feeds them in the short term. (Photo courtesy of CATIE)

"We were used to living off the land, and then suddenly there was this law that completely prohibited all our normal activities and said that if we didn't obey, we'd go to jail. The change was like night and day, and so, of course, the farmers reacted violently."



FIGURE 3 A homestead in the Los Santos Forest Reserve, which is part of the La Amistad Biosphere Reserve in the Talamanca Cordillera. (Photo courtesy of CATIE)

“You begin to value the forest more because you can see the services it offers to people. So you begin to think: the more I protect it, the more possibilities I have for survival. ... the forest feels like my other home.”

concern about the disappearance of forest plants and wildlife and from conversations with friends who were not hunters.

I have not been a conservationist for long; it's only been about 10 years since I began to think differently. I became interested because at some point it occurred to me that there weren't any more curasows or monkeys in the forest and that there were fewer tapir and pecari tracks. It made me realize that we were killing a lot of animals. I also have friends who enjoy walking through the forest and they commented on the problems they saw there. Every day I became more and more conscious. I also think that my work as a mountain guide for the Costa Rican Red Cross helped me a great deal. I learned a lot about the different products the forest offers: food, medicine, shelter.

I feel good now and grateful to my friends because what I have learned about nature is really interesting. You begin to value the forest more because you can see the services it offers to people. So you begin to think: the more I protect it, the more possibilities I have for survival. ... the forest feels like my other home.

Now Carlos shares his knowledge with visiting foreign students who want to study nature or with tourists attracted by the rich abundance of the highlands. They hire him as a guide to climb to the summit of Chirripo, which at 3800 masl is the highest mountain peak in the country.

Creation of the Cuericí Biological Station

One day, as Carlos was walking through the forest with his friends, he remarked that his grandparents' land was to be sold. He commented that his biggest concern was that the buyer might be a logging company and that they would cut down the extensive oak stand.

Faced with this possibility, Carlos and seven other people interested in forest conservation formed an anonymous society that purchased the 200 acre farm (150 ha of primary forest and 50 with secondary forest and pastures). The parcel is bordered

to the north by Tapanti–Macizo de la Muerte National Park and to the east by Chirripo National Park, thereby converting the area into a buffer zone.

Carlos built his house on this farm, but since 1991, he and his family have had lots of company since they house around 250 students per year from universities all over the world for 3–10 days each. The students take biology and ecology courses focusing on highland forests, at what is now the Cuericí Biological Station. Carlos recalls,

At first it was very hard. We built a plastic house, with really basic services. Little by little, using the money the students paid for housing, without having to take out a bank loan, the lodge and the meeting room were improved and enlarged. The lodge can now comfortably house 40 people.

The facilities were built from oak trees that fell naturally or from alder extracted from an area that Carlos and his children planted and that is to be reforested.

The society owns the lands where the Biological Station is located, but it leases the services to Montaña Adentro, a company of which Carlos is a member and which also administers the courses.

The station offers lodging with hot water, food, a research area, a meeting room with electricity, and guided walks. The electricity is provided by a Pelton generator powered by pond water.

I made the generator myself, 5 years ago, and it turned out pretty well. It hardly ever gives me any trouble; you just have to replace the belt once a year and keep it oiled. It has been a great help with the students because they can use projectors, computers, and printers, and it means they can have hot water because, when there are few lights on or at night, the excess power is automatically diverted to heat water.

Despite the fact that the creation and operation of the station could generate jobs for the local people, it was not well received at first because of problems caused by restrictions imposed on the hunting and capture of birds on the property.

It created a tense situation and people got upset, but little by little they began to come round. This change was a result of some talks given by some people from the Ministry of the Environment and Energy and also because new alternatives for generating more family income appeared. It was a very interesting process. In El Jaular, there are now only two people who like to hunt; the rest of us are 100% conservationists.

Carlos and his associates have several irons in the fire. Among them is a plan to initiate school children into the concepts of conservation by having them visit the station. According to Carlos,

They talk a lot about conservation in the classroom but they never visit the forest. There are many children living near the forest who have never been in it. They don't know which tree or animal is endangered because no one has taught them. The next step is to educate the children because they are our future.

Trout breeding: Another highland passion

Carlos loves challenges as well as new projects. In partnership with one of his brothers and with the help of his children, he has become an important trout breeder and sells fingerlings to 15 families who use the fish to stock ponds for sport fishing and restaurants in the area. It is a family-owned and operated business.

To start the trout business, Carlos studied the incubation period of the fish for 14 years. He says,

I got some information from the United States on the subject, and the pamphlets described a method for taking the eggs that I started to use, but they all died. So I examined the females to see what was wrong and find out why the eggs died. After much trial and error, I was successful with the trout breeding. I don't use chemicals to prevent fungus diseases, but they still come out real strong.

Trout fingerlings are bred at Cuericí from September to January and are sold

beginning in February. Between 70,000–80,000 fish are bred every year and sold for US\$0.066 each, which translates into a total income of US\$4600–5300/year. The business has brought in enough income for some of the money to be reinvested in building projects at the Lodge. In addition, about 10,000 trout are eaten each year by students and associates and friends who enjoy sport fishing.

The adult fish are fed on worms kept to make compost from organic waste.

"We feed all the garbage produced by the students to the worms, and then feed the worms to the fish, and in turn, they provide me with excellent fingerlings," says Carlos proudly.

Closing the forest use cycle

His conviction that one can live in harmony with nature has laid the foundation for all the good experiences he has had with his various undertakings over the last 10 years. As Carlos says, he likes to be involved in a variety of projects.

By doing things, I provide myself with long-term alternatives. I always think about my projects as having a 5-year term, minimum. My idea for this farm is to close the cycle of use. It is like a wire circle that you begin to close until you know all the benefits and get the most out of them.

Carlos now plans to start an organic agriculture project. He would like to use compost produced by the worms he feeds to the trout to plant vegetables as a food source for the students and his family. He would also like to have stabled goats on his farm, like those he saw at CATIE, to produce biogas. He could use the goat manure to produce cooking gas and thereby reduce his overhead costs.

Carlos Solano has discovered the bounty Nature has to offer if one knows how to take advantage of her generosity. Carlos and his wife Mayela and their children Luis, Alexander and Anita would have a hard time leaving the peace, tranquillity, beauty, and fresh air that surround them in the highland forests of El Jaular.



FIGURE 4 Ecotourism is an important source of income in Costa Rica. Local visitors, foreign tourists, students, and scientists specifically visit such national parks as the recently established Tapanti-Macizo de la Muerte National Park to see the unique features of the local environment. (Photo courtesy of CATIE)

"In El Jaular, there are now only two people who like to hunt; the rest of us are 100% conservationists."

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