

## COURSE REPORT

# Ecological Restoration Strategies for Cattle Ranching Landscapes of the Azuero

ELTI Focal Training Sites  
District of Pedasi, Province of Los Santos  
September 25-30, 2016

A field course organized by:  
The Environmental Leadership & Training Initiative (ELTI)  
and the Association of Livestock and Agrosilvopastoral Producers of Pedasi (APASPE)



Saskia Santamaría - ELTI



ESTRATEGIAS PARA  
LA RESTAURACIÓN ECOLÓGICA  
EN PAISAJES GANADEROS DE AZUERO

**Background:** Panama's Azuero Peninsula is a region that has suffered severely from land degradation, most due to conventional agriculture and livestock systems. Conventional cattle ranching, in particular, occupies over 50% of the land area in the Azuero and promotes hostile, treeless landscapes via the removal of tree regrowth, planting of invasive-exotic pasture grasses, recurrent fires, excessive use of agrochemicals and overgrazing<sup>1</sup>. Such degraded pasture landscapes result in impaired ecosystems and increased vulnerability to climate change, which threatens the agricultural sector and those that depend on it. While the situation of degradation in the Azuero is severe, ecosystem restoration can be achieved if corrective action is taken. Livestock production can be more sustainable by utilizing silvopastoral system (SPS) practices, which integrates trees, forage shrubs and

1. Castillo et al. 2015. Mapa de Cobertura y Uso de la Tierra 2012. MiAmbiente & Programa OUN-REDD.

ELTI is an initiative of:

**Yale** SCHOOL OF FORESTRY &  
ENVIRONMENTAL STUDIES

In collaboration with:

Smithsonian Tropical Research Institute PANAMA



livestock production into a more efficient land use system. SPS incorporate beneficial trees and intensifies natural ecological processes to not only augment production, but also to improve the integrity of ecosystem services.

To strengthen environmental capacity, ELTI offers intensive field-based courses situated in diverse biophysical and socio-economic landscapes. ELTI courses convey the concepts, techniques and advances of tropical forest restoration through a series of lectures, case studies and field-based visits. For a more hands-on experience, courses are facilitated at ELTI's Focal Training Sites located on the Azuero Peninsula, which utilize model farms, interpretative trail networks and demonstration areas to provide course participants with the opportunity to learn about on-going research and partake in group exercises, illustrating the importance of the scientific method to develop sound restoration strategies.

To communicate the practices and benefits of forest restoration to other land owners in a practical and culturally sensitive manner, ELTI integrates landowners from the Association of Livestock and Agrosilvopastoral Producers of Pedasi (APASPE), as co-facilitators. APASPE is a local organization of environmental leaders at the forefront of transforming the Panamanian ranching sector, promoting the use of sustainable practices in order to benefit the environment, producers, their families and other inhabitants of the region. APASPE members effectively transmit their knowledge and experiences to other decision makers by facilitating "farmer to farmer" exchanges on their model farms.

**Objectives:** The overall goal of the course was to introduce extension agents and local landowners from critical watersheds in Panama to the role that forests play in providing ecosystem services as well as the types of restoration strategies that can be integrated into agricultural landscapes to restore ecological function.

**Field-Course Format:** The course was divided in six training modules, illustrated through introductory lectures, field-based demonstrations and group exercises facilitated by ELTI staff and APASPE members, as follows:

Module 1: ***Forest ecology and ecosystem services***

Module 2: ***Land use and the forest degradation***

Module 3: ***Strategies for restoring ecosystem services in ranching landscapes***

Module 4: ***Sustainable ranching as an alternative to conventional methods***

Module 5: ***Community environmental organizations for advancing ecological restoration***

Module 6: ***Developing a farm management plan***



**Field-Course Format:** This course took place over five days at ELTI's Focal Training Sites in the tropical dry forest, located in the Province of Los Santos in the Azuero Peninsula. These sites demonstrate the varied biophysical and socio-economic contexts of different types of land use: (1) the Achotines Forest Reserve, a mature tropical dry forest; (2) the Madroño property, an abandoned cattle pasture in the early stages of a regenerating secondary forest; (3) IDB Forestal, a native species tree plantation that incorporates cattle grazing in the understory; and (4) the APASPE model farms, which are privately-owned properties that have established silvopastoral and agroforestry systems, home gardens and riparian forest restoration. The following activities occurred throughout the week:

- **Day 1:** The course participants arrived in the afternoon and introductions were conducted. Saskia Santamaria (Neotropics Training Program Assistant) facilitated an introductory presentation about ELTI and the objectives of the course. Jacob Slusser (Neotropics Training Program Panama Coordinator) delivered an introductory lecture on the importance of ecosystem services and how tropical dry forests provide them.

- **Day 2:** Jacob presented an introductory lecture on forest ecology and degradation of Panama's tropical dry forests and then led a field trip on ELTI's interpretive trail network, within the Achotines forest, where participants visited six different demonstration areas. The walk included the following topics; dry forest species identification, functional characteristics, sucesional guilds, forest regeneration and successional phases and hydrological cycles in riparian areas. In addition, participants worked in groups to conduct a soils assessment on macro-fauna, soil structure, texture, infiltration and pH, comparing differences between a ridgetop and lowland forest.

Afterwards, Jacob presented a lecture on the range of passive/active forest restoration strategies that can be utilized in agricultural landscapes. Following the lecture, Jacob led field visits to two properties demonstrating



different restoration strategies. In the Madroño property, participants were shown the results of passive and assisted natural regeneration (ANR) activities in a ten year-old abandoned cattle pasture. The practices ranged from selective cleaning around desired species to enrichment planting where favored species were absent. Participants also visited IDB Forestal, an active restoration example, where native tree species plantations were established and then cattle graze in the understory once the trees reach a certain height. Ranch manager Jaime Madrid explained the owner's objectives and management regime. The two sites were compared in terms of their success to achieve the owner's goals, while considering cost efficiency.

In the evening, Jacob delivered an introductory lecture about sustainable ranching methods via silvopastoral systems (SPS). Jacob presented SPS not just as a model for production, but as a tool to facilitate ecological restoration by increasing biodiversity and utilizing conservation practices to recuperate ecosystem function.

- **Day 3:** Belgis Madrid, President of the Association of Livestock and Agrosilvopastoral Producers of Pedasi (APASPE), presented on the experience of creating and managing a community-based group. He specifically discussed the process of obtaining legal status, the planning and application for project funding, the implementation and management of their project and the strategies for disseminating their successes and challenges to others.

Afterwards, participants traveled to the small town of Los Asientos to meet APASPE members and visit three different model farms that demonstrate a range of restoration practices where the owners have integrated diverse forest cover while maintaining production in pastures via the use of; living fences, natural regeneration of trees in pastures, restoration of riparian areas, intensive silvopastoral systems, mixed forage banks, grazing within forest plantations and agroforestry. Owners of the farms discussed their experience of transforming conventional cattle ranches into silvopastoral systems and the resulting improvement of ecosystem services and increased on-farm production.

The day also focused on restoration of riparian areas, since sources of water are critical for ranchers, but are often degraded due to deforested buffer zones and open riparian access to cattle. Manuel Cedeño, Treasurer of APASPE, delivered an introductory presentation about water management in livestock production. In the field, participants visited two different cattle aqueducts, which utilize water banks, reserve tanks and solar powered pumps to provide water to cattle. Water delivery systems are critical to restrict cattle access to riparian areas in order to conserve gallery forests and water sources as well as to facilitate the division of pastures for intensive rotation systems.



Saskia Santamaria - ELTI

- **Day 4:** The final full day was focused on putting the course concepts into practice. Participants visited a farm that had suffered high levels of degradation due to conventional cattle ranching practices. Next, they worked in groups and conducted a site diagnostic, utilizing a conceptual restoration model to develop their strategy to increase forest cover. Groups presented their plans to the owner of the farm, who provided feedback.

During the final exercise, participants worked in pairs (extension agent and their respective community counterpart) with the objective to develop a farm management plan designed for the property of the counterpart. Jacob provided an introductory lecture on the ten-step process, including; drawing a farm map, rating and qualifying their farm on twelve criteria, planning restorative activities on a table and then updating the farm map to illustrate interventions. Each group presented and were provided feedback by the facilitators. While conducted as a course exercise, the farm plan is a tool that extension agents will use in their communities to develop concrete strategies with their counterparts.

Saskia presented ELTI's Leadership Program and the types of resources and support that ELTI provides its alumni. She discussed various examples of how ELTI alumni have requested support and implemented course themes in the field. Participants filled out course evaluations and submitted them to ELTI Staff. Afterwards, participants, ELTI Staff and APASPE members joined together for a final dinner to celebrate the closure of the course.

- **Day 5:** Course certificates were presented to participants and a group photo was taken before departing.



**Instructors and Coordinators:** The course was facilitated by ELTI's Neotropical Training Program Staff; Jacob Slusser (Panama Coordinator) and Saskia Santamaría (Program Assistant). Saskia introduced the course's objectives to the participants, as well as ELTI's Leadership Program at the conclusion of the course. Jacob delivered introductory lectures and field demonstrations on the concepts of ecosystem services, forest ecology, restoration strategies and sustainable ranching systems (silvopastoral systems). In addition, course collaborators: Jaime Madrid of IDB Forestal, and Belgis Madrid, Zoilo Vergara, Manuel Cedeño, Odielca Solís and Dolores Solís of APASPE facilitated portions of the field trips to their model farms.

**Participants:** The course was offered to Community Environmental Conservation extension agents of the US Peace Corps and their respective community counterparts (landowners), whom were interested in conducting forest restoration on their farms. Participants were selected from within critical watersheds of Panama.

**Course Follow-up:** Participants were actively engaged in learning about the range of restoration strategies which can be applied in agricultural landscapes. Extension agents will work with their counterparts to implement farm management plans on their properties and help them become community-based promoters of forest restoration practices. Numerous extension agents expressed interest in applying for Leadership Program support to facilitate exchanges for other members of their community to visit ELTI's Focal Training Sites.

**Cost:** This course was offered at no cost for 11 selected participants thanks to collaborative support from the generous donation of the Arcadia Fund (<http://www.arcadiahfund.org.uk>).

---

*This event was possible thanks to Arcadia Fund, whose Environmental Conservation grants support programmes that protect and enhance biodiversity, and provide field training and academic research.*