

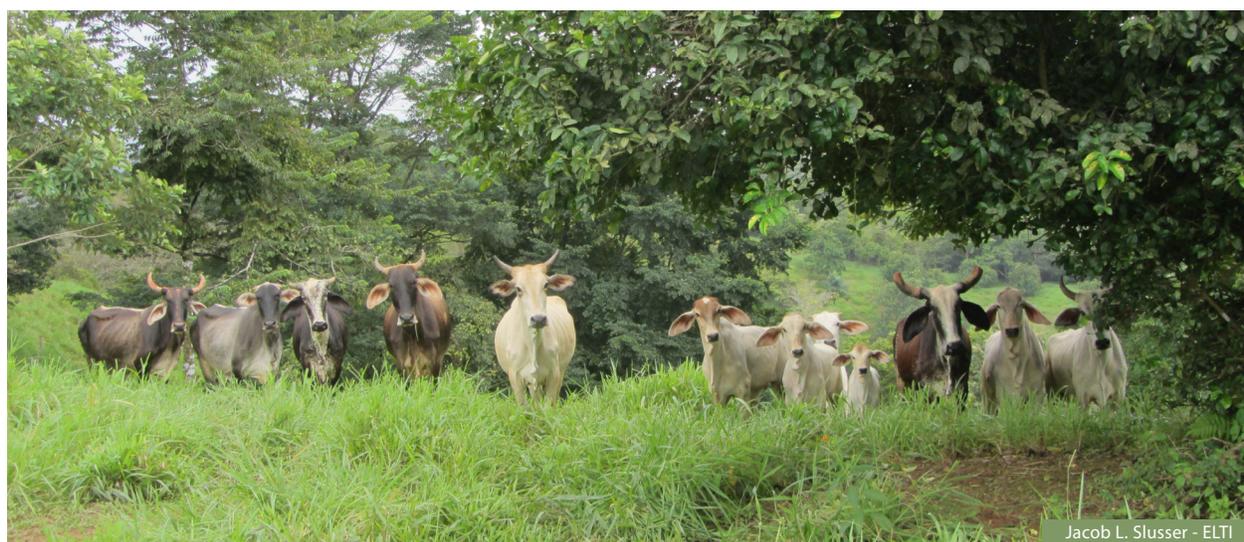
COURSE REPORT

**Ecological Restoration Strategies for
Cattle Ranching Landscapes of the Azuero**

District of Pedasi, Province of Los Santos
July 27 - 31, 2015

A field course organized by:

The Environmental Leadership & Training Initiative (ELTI) and the Association of Livestock and Agro-Silvopastoral Producers of Pedasi (APASPE)



ESTRATEGIAS PARA
LA RESTAURACIÓN ECOLÓGICA
EN PAISAJES GANADEROS DE AZUERO

Background: The Azuero Peninsula, an agricultural intensive region with the lowest rates of forest cover in Panama, is currently suffering from the worst drought in nearly 100 years due to a strong El Niño effect. The monoculture agriculture and livestock landscapes that are common in the region are proving to be highly vulnerable to such droughts and other extreme climatic changes because of the lack of their ecosystem resiliency. One common land use, conventional cattle ranching, continues to degrade land by promoting hostile, treeless landscapes via the removal of tree regrowth, planting of invasive-exotic pasture grasses, recurrent fires, overuse of agrochemicals and overgrazing. As a result, these pasture landscapes offer low farm productivity, environmental degradation and increased vulnerability to climate change, which threaten rural livelihoods and the ranching sector.

ELTI is an initiative of:

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While the situation of degradation in productive lands in the Azuero is severe, forest restoration can be achieved if corrective action is taken. Livestock production can be more sustainable by combining better management practices with the establishment of silvopastoral systems (SPS), which integrates trees, forage shrubs and livestock production into a more efficient land use system. SPS incorporate beneficial trees and intensify natural ecological processes to not only augment production, but also to improve the integrity of ecosystem services. SPS also promote the protection of remaining forests, their connectivity and the restoration of watersheds. The protection of riparian areas is critical in the Azuero, since streams and rivers of many districts have dried up or have become contaminated due to poor management and unsustainable practices. To recuperate the provision and regulation of ecosystem services in a highly fragmented landscape as the Azuero, it is necessary to understand the fundamentals underlying ecosystem services, forest ecology and the integration of forests in productive systems.

To communicate the practices and benefits of forest restoration to local audiences in a culturally sensitive manner, ELTI integrates a community group of environmental leaders, like the Association of Livestock and Agro-Silvopastoral Producers of Pedasi (APASPE) to support their training courses. APASPE is a local organization that has developed themselves as pioneers in the transformation of the Panamanian ranching sector, promoting the use of sustainable practices that help to protect water resources and restore soil quality, in order to benefit the producers, their families and all the inhabitants of the region. Therefore, their experiences and accomplishments are imperative to illustrate to other landowners that sustainable practices can be implemented and be beneficial.

Objectives: The overall goal of the course was to introduce local landowners to the role that forests play in providing ecosystem services and the types



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of sustainable practices that can be integrated into productive landscapes as a way to both restore the integrity of ecosystems and sustain agricultural production.

Field-Course Format: This course took place over five days at ELTI's Focal Training Sites in the dry tropical forest that are 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 dry forest; (2) the Madroño property, an abandoned cattle pasture that is a young-regenerating secondary dry forest; (3) IDB Forestal, a native species tree plantation that incorporates SPS practices; and (4) the APASPE model farms, which are privately-owned properties that have established silvopastoral and agroforestry systems and riparian zone restoration. The content was divided in six core training modules, illustrated through introductory lectures and field-based demonstrations and exercises facilitated by ELTI staff, APASPE members and collaborators, as follows:

- **Module 1: Basic forest ecology and ecosystem services** The first module presented a general introduction composed of three main themes: (1) ecosystem goods and services that originate from forests; (2) how tropical dry forests function; and (3) forest dynamics (succession and natural regeneration). The concepts introduced during the lectures were complemented in the field with a visit to ELTI's interpretative ecological trail located in the Achotines Forest Reserve. Throughout various demonstration sites, the participants observed different patterns, processes and characteristics of the mature coastal dry forest. Discussions focused on how abiotic and biotic factors influence the structure of the forest, its differences from wet forests and how it produces and regulates ecosystem services. Forest dynamics were demonstrated in a number of areas illustrating different rates of forest growth and change based on disturbance regimes, regeneration potential and successional phases.

- **Module 2: Land use and the degradation of ecosystem services**

The second module provided an introduction of the regional drivers of forest degradation. Examples in the field illustrated how conventional agricultural practices degrade forests and their ability to regenerate naturally, ability to provide ecosystem services, in addition to the negative socio-economic consequences upon local agrarian livelihood practices and public health.

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

The third module presented a simple diagnostic method to develop appropriate restoration strategies based on biophysical and socio-economic variables, such as: (1) ecosystem resiliency; (2) land use history; (3) landscape matrix; (4) landowner goals and objectives; and (5) resource availability. Participants were also introduced to the principles and methods for forest restoration, via a range of passive-active restoration options for productive landscapes; (1) natural regeneration; (2) assisted natural regeneration (ANR); (3) reforestation; (4) agro-successional systems; (5) agroforestry; and (6) silvopastoral systems. Field trips to the Achotines Forest Reserve and other properties that form ELTI's Focal Training Sites illustrated the different types of restoration strategies that can be implemented, their benefits and the different constraints to establishing them.

- **Module 4: Sustainable ranching: An alternative to conventional ranching**

This module focused on providing a more profound understanding of sustainable ranching practices, such as silvopastoral systems (SPS). Participants were introduced to three important components of SPS: (1) the context of unsustainable cattle ranching practices and its effects on production levels and ecosystem services; (2) the importance of biodiversity in agro-landscapes; and (3) the benefits of silvopastoral systems and the factors to consider in implementing, establishing and maintaining them. Participants visited a number of APASPE model farms, where each member/owner led the visit, explaining the range of alternatives to conventional ranching they have established on-farm, including; mixed forage bank, intensive SPS, riparian zone restoration and a timber plantation reforested with native



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species. In addition, participants learned about water management, which is key for cattle ranching systems, by visiting rainwater collection systems and cattle aqueducts. These visits served to illustrate the practical and beneficial application of the themes covered in the course on a locally-owned, private farm, which is an ideal environment to facilitate “farmer to farmer” learning.

- **Module 5: Community organizations: Advancing ecological restoration via local leaders**

APASPE’s Executive Board members presented on their experience of creating and managing a community-based group, specifically discussing 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 in the region. In addition, a separate session was provided to allow an informal discussion between members and participants who had questions about forming their own community association.

- **Module 6: Restoration diagnostics: Developing a farm management plan**

The final day focused on the participants utilizing the knowledge they had learned during the course to develop a farm management plan with the objective to implement ecological restoration strategies on an actual farm. Participants were provided a tour of a local, conventional farm to serve as a context to conduct a farm diagnostic. Participants were split into groups and asked a series of questions that obligated them to make observations about the property and develop strategies that were adequate for the farm and owner’s constraints. The farm owner was present to answer questions from participants, explain her values and goals for the farm and provide feedback to the proposed strategies developed by participants.

The final exercise built on the diagnostics exercise, by utilizing the diagnostics protocol they had learned in the field, but applying it to a property or landscape in their region. Participants were split into groups and each was directed to draw a picture of one of the group member’s farm on a large piece of paper. They were asked to illustrate the characteristics of the farm, such as; type of ecosystem, type of soils, topography, sources of water, existing vegetation, infrastructure and current management regimes. They were then asked to discuss the types of restoration strategies that could be completed on their farm while considering the resiliency of the ecosystem, land use history, surrounding landscape conditions, along with the owner’s objectives and the economic cost of implementing the strategy.

Applying the theory and practice learned during the course, the groups discussed and presented on a variety of different restoration strategies taken on each farm. The exercise emphasized the importance of reviewing a farm’s strengths and weaknesses and one’s resources and objectives to develop appropriate restoration strategies. In addition the participants were able to present their plan and receive feedback from the instructors and their peers.



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 and format to the participants, as well as ELTI's Leadership Program at the conclusion of the course. Jacob led the presentations on the concepts of ecosystem services, forest ecology, restoration strategies and sustainable ranching systems (silvopastoral systems) in lecture format as well as field visits at the demonstration sites. In addition, course collaborators: Jaime Madrid of IDB Forestal, and Belgis Madrid, Zoilo Vergara, Manuel Cedeño, Odielca Solís, Nicolás Solís and Dolores Solís of APASPE facilitated portions of the field trips to their model farms.

Participants: This course was designed to provide the participants with an understanding of how forests provide and regulate ecosystem services and the methods to reintegrate the ecological function that has been degraded due to conventional practices. The audience for the course was selected by the Ministries of Agriculture (MIDA) and Environment (MiAmbiente) and the US Peace Corps. Participants ranged from ministry officials, extension agents and community leaders whom reside or work directly within the critically threatened La Villa River Watershed. In addition, one international participant (an ELTI On-Line Course Alumnus) from Mexico attended the course to compliment theoretical knowledge gained from the on-line course.

Course Follow-up: Participants were actively engaged in learning about restoration strategies for cattle ranching landscapes. In addition, individuals were very excited to transmit this knowledge to their communities and implement changes in their farms. Also the participants expressed interest in receiving further ELTI trainings and professional assistance to help them develop their own community-based ranching organizations and identify potential funding opportunities, which will be conducted via ELTI's Leadership Program.

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.