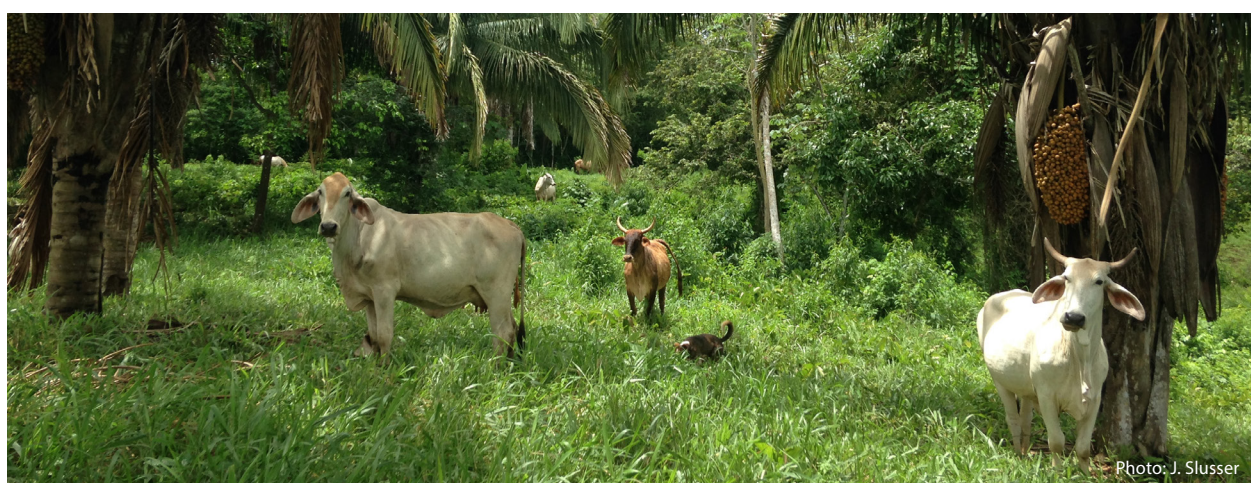


COURSE REPORT

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

**ELTI Focal Training Sites
District of Pedasi, Province of Los Santos
July 24-28, 2017**

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



Silvopastoral systems (SPS) in the tropics integrate diverse species that is a more environmentally friendly system that also increases livestock production.



ESTRATEGIAS PARA
LA RESTAURACIÓN ECOLÓGICA
EN PAISAJES GANADEROS DE AZUERO

Background: The tropical dry forest, the most endangered ecosystem in the Neotropics, is threatened by the dominance of extensive conventional cattle ranching. The consequences of this land use system are particularly evident in the dry forest ecosystem of Panama’s Azuero Peninsula. Deforestation and soil degradation has impaired ecosystem services, which are necessary to support ranching and agricultural livelihoods. In addition, the extremes in rainfall and drought associated with climate change further compound the stresses of unsustainable land use practices and make efforts to restore the ecosystem particularly challenging. Nevertheless, advances in forest restoration and silvopastoral system (SPS) practices have shown to enhance production and ecosystem services in cattle ranching landscapes. SPS integrates trees, forage shrubs, and livestock production for a more efficient land use system. Unfortunately, these

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Photo: S. Santamaria

Participants learn about the characteristics of key tree species in the dry tropical forest.

practices are virtually absent from the Panamanian landscape, mostly due to the lack of information and incentive available to cattle ranchers.

To strengthen forest restoration capacity, ELTI offers practical, hands-on field-based courses, facilitated at ELTI's Focal Training Sites located in the Azuero Peninsula. In the Focal Training Sites, course participants learn the importance of the scientific method in the development of sound restoration strategies from on-going research and group exercises in the model farms, interpretative trail networks, and demonstration areas for the Focal Training Sites. To communicate the practices and benefits of forest restoration to other landowners in a practical and culturally appropriate manner, ELTI integrates landowners from the Association of Livestock and Agrosilvopastoral Producers of Pedasi (APASPE) as co-facilitators. APASPE is a local organization from of environmental leaders at the forefront of transforming the Panamanian ranching sector by promoting the use of sustainable practices in order to benefit the environment, producers, their families, and other inhabitants of the region. APASPE members effectively disseminate their knowledge and experiences to other decision makers by facilitating "farmer to farmer" exchanges on their model farms.

This training was offered to extension agents (Peace Corps Volunteers) and community counterparts (landowners), who were interested in strengthening their knowledge and practical skills of forest restoration. Over a period of five days, course participants learned the technical skills necessary to design and implement strategies to increase forest cover and ecosystem services in cattle ranching landscapes. Additionally, participants had the opportunity to learn and exchange experiences, concepts and practical tools with ELTI facilitators, local experts, and peers.

Course Objectives: The overall goal of the course was to educate participants on 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 and sustain production.



Photo: S. Santamaria

Participants learn about arrested forest succession in a disturbed area of the forest.

Content: 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: ***Limitations for the restoration and provision of ecosystem services***

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

Module 4: ***Sustainable cattle ranching, environmental and productive contributions***

Module 5: ***The role of community associations in restoring degraded cattle ranching landscapes***

Module 6: ***Final exercise: Developing a farm plan for forest restoration***

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 by members who have established silvopastoral and agroforestry systems, home gardens, and riparian forest restoration. The following activities occurred throughout the week:

Day 1: Course participants arrived at the Achotines Tuna Laboratory and were given an introduction about the laboratory and a tour of the installations. After introductions, 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 a lecture on the importance of ecosystem services and how tropical dry forests provide them.



Belgis Madrid, President of APASPE presents on the organization's experience working as a community based association to lead sustainable ranching and forest restoration practices.

Photo: J. Slusser

Day 2: Jacob presented an introductory lecture on forest ecology and degradation of Panama's tropical dry forests. Afterwards, he 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, successional guilds, forest regeneration and successional phases, and hydrological cycles in riparian areas. In addition, participants worked in groups to conduct soils assessments on macro-fauna, soil structure, texture, infiltration, and pH, comparing differences between a ridgetop and lowland forest.

Afterwards, Jacob presented on a range of passive and active forest restoration strategies 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 cattle were released to graze in the understory once the trees reached 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.



Photo: S. Santamaria

APASPE member, Dolores Solis describes the agro-successional system he established, which integrates traditional food and forage crops with high value timber species.

In the evening, Jacob delivered an introductory lecture about sustainable ranching methods via 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 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 the APASPE project, and strategies for disseminating the successes and challenges to others.

Participants then 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. The owners of these farms integrate 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 SPS, mixed forage banks, grazing within forest plantations,



and agroforestry. The owners shared their experience of transforming conventional cattle ranches into SPS and the resulting improvement of ecosystem services and increased on-farm production.

The day also focused on restoration of riparian areas. Although sources of water are critical for ranchers, they are often degraded due to deforested buffer zones and open riparian access to cattle. In the field, participants visited two different cattle aqueducts, which utilize water banks, reserve tanks, and solar powered pumps to provide clean water to cattle. Water delivery systems are a crucial alternative to cattle freely utilizing riparian areas as a source of water. Therefore, these systems help conserve gallery forests and water sources as well as to facilitate the division of pastures for more productive intensive rotational systems.

Day 4: The final full day of training 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 with their respective community counterpart) 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 in a table, and then updating the farm map to illustrate interventions. Each group presented and received feedback by the facilitators. Although conducted as a course exercise, the farm plan is also 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 to 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.



Photo: ELTI

Participants and facilitators at the conclusion of the training course.

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 (SPS). In addition, course collaborators: Jaime Madrid of IDB Forestal, Jorge Gutierrez (ELTI), Belgis Madrid, Zoilo Vergara, Odielca Solís, and Dolores Solís of APASPE facilitated portions of the field trips to their model farms.

Participants: The course was offered to Peace Corps Volunteers (extension agents) and their respective community counterparts (landowners), who are interested in conducting forest restoration on their farms. Participants were selected from within critical watersheds and buffer zones of protected areas 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 12 selected participants thanks to collaborative support from the generous donation of the Arcadia Fund (<http://www.arcadiafund.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.