Environmental Leadership & Training Initiative

COURSE REPORT

Ecological Restoration Strategies for Cattle Ranching Landscapes of the Azuero

District of Pedasi, Province of Los Santos
June 22 - 26, 2015

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


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ESTRATEGIAS PARA
LA RESTAURACIÓN ECOLÓGICA
EN PAISAJES GANADEROS DE AZUERO

Background: The Azuero Peninsula, a highly productive agricultural region of Panama, is currently facing an environmental crisis. While deforestation rates have slowed in the last ten years in the highly endangered dry tropical forest ecosystem, land degradation continues via extensive agriculture and particularly conventional livestock practices. These practices promote 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.

While the situation of degradation in productive lands in the Azuero is severe, it can be reversed if corrective action is taken. Livestock

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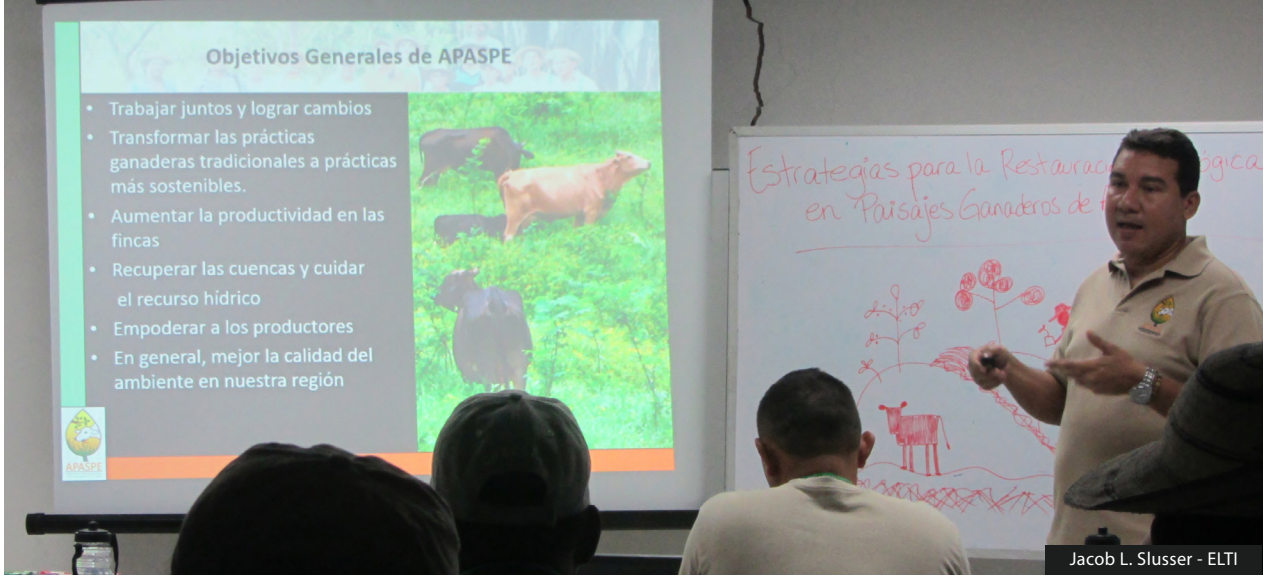
production can be more sustainable by combining better management practices with the establishment of silvopastoral systems (SPS), which integrates trees, forage shrubs and livestock production into a more efficient land use system. SPS incorporate beneficial trees and intensify natural ecological processes 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 dry up during summer months or have become contaminated due to 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.

Despite a recent increase in research of ecological restoration for agricultural landscapes, this knowledge has not been effectively communicated to local landowners in Panama, who are directly making land use decisions. In fact, in Panama and especially in the livestock landscapes of the Azuero Peninsula, there is a great need for more training opportunities to help inform decision makers about the management, use and restoration of forests, which ELTI has conducted since 2009. 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 Agrosilvopastoral 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 of sustainable practices that can be integrated into productive landscapes as a way to both restore the integrity of ecosystems and sustain production. The individual objectives were to:

- Introduce the basic concepts of forest ecology and how tropical forests influence the provision and regulation of ecosystem goods and services.
- Analyze land use in ranching landscapes and the causes of environmental degradation and its impact on the ecosystem goods and services.
- Improve the knowledge of different strategies, tools and technologies available to inform and guide decisions regarding land use and restoration of forests.
- Introduce the concepts of SPS and the menu of options that can be utilized to improve the integrity of ecosystem services and increase production in conventional ranching systems.
- Facilitate farmer to farmer discussions regarding; sustainable ranching systems, community organization and project development experiences with an established sustainable ranching organization.
- Develop strategies and individual farm management plans that illustrate where components of SPS and forest restoration can be integrated on-farm.
- Provide participants with the opportunity to meet and establish contacts for collaboration, technical assistance and to generate projects that can be supported through the Leadership Program.

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. The 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, 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 locally-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: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• 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 illustrated 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 and provide ecosystem services, which lead to negative 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 demonstrated the different types of restoration strategies that can be implemented according to different biophysical and socio-economic contexts.

• 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


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they have established on-farm, including; mixed forage bank, intensive SPS, riparian zone restoration and a timber lot reforested with native species. In addition, participants learned about the management of such systems, especially the greater dependence on biodiversity and declining need for agrochemicals. These visits served to illustrate the practical application of the themes covered in the course in an actual farm setting, which is an ideal environment to facilitate "farmer to farmer" learning.

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

APASPE 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 to the community and region. A separate session was developed to provide an informal discussion between members and the participants.

- **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 integrate ecological restoration strategies on-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 off of the diagnostics exercise, by utilizing the same method to recognize the strengths, weaknesses and opportunities of areas where the participants would apply course themes. Again, 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 site and landscape conditions, 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 and received feedback from the instructors and their peers.

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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 in the field at the demonstration sites. In addition, course collaborators: Jaime Madrid of IDB Forestal, and Belgis Madrid, Zoilo Vergara, Manuel Cedeño, Odielca Solis, Nicolas Solis and Dolores Solis of APASPE facilitated portions of the field trips to the 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 ecological function that has been degraded due to conventional practices. The audience for the course was selected by the Ministry of Agriculture (MIDA) and Environment (MiAmbiente) and the US Peace Corps and ranged from ministry officials, extension agents to community leaders and farmers whom are part of or work directly with the La Villa and El Gato River Watershed Committees.

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. Finally, this course demonstrated the abundance of interest for ecological restoration courses for diverse decision makers in the Azuero Peninsula.

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.