

COURSE REPORT

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

District of Pedasi, Province of Los Santos
October 6 –10, 2014

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, while home to Panama’s famous folkloric cultural traditions, is also considered the most deforested region of the country. Degradation of the highly endangered dry tropical forest of the Azuero is due to conventional agriculture and livestock practices that promote hostile, treeless landscapes. In particular, extensive cattle ranching, which includes the planting of invasive pasture grasses, recurrent fires and use of agrochemicals, is common throughout the Azuero and has led to low farm productivity, few social benefits, environmental degradation and increased vulnerability to climate change.

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

ELTI is an initiative of:

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In collaboration with:



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Objectives: The overall goal of the course was to introduce local landowners to the role that forests play in providing and regulating 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 ecosystem 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 silvopastoral systems 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.
- Introduce the method of conducting a farm diagnostic in order to develop individual farm management plans for the implementation of adequate land use and ecological restoration strategies.
- 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 Permanent Training Sites in the dry 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, a regenerating young-secondary dry forest; 3) IDB Forestal, a native species tree plantation that incorporates silvopastoral practices; and 4) the APASPE model farms, which are locally-owned properties that have established restoration practices such as 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 and collaborators, as follows:



- **Module 1. Basic forest ecology and ecosystem services**

The first module presented a general introduction composed of four main themes: 1) characteristics of tropical dry forest ecosystems in the Azuero region; 2) ecosystem goods and services that originate from forests; 3) forest ecology; and 4) forest dynamics. 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 the influence that forests have upon the provision and regulation of ecosystem services, the characteristics of a mature forest and how forests grow and change based on their 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 provide and regulate ecosystem services as well as the negative consequences of these practices upon local agrarian livelihood practices and public health.

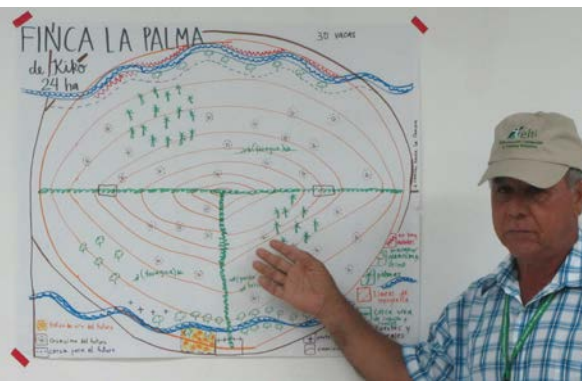
- **Module 3. Strategies for restoring ecosystem services in cattle ranching landscapes**

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 the range of passive-active restoration options for productive landscapes; 1) natural regeneration; 2) assisted natural regeneration (ANR); 3) reforestation; 4) agro-successional crops; 5) agroforestry; and 6) silvopastoral systems. Field trips to the Achotines Forest Reserve and other properties that form ELTI's Permanent Training Sites demonstrated the different types of restoration strategies that can be implemented in agricultural landscapes, considering the owner's individual social values.

- **Module 4. Sustainable ranching: An alternative to conventional cattle 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. In addition, APASPE's Production Secretary, Belgis Madrid, presented on the APASPE's efforts implementing sustainable ranching systems amongst its members. Complementing this, participants visited the APASPE model farm of member Zoilo Vergara, who has implemented various sustainable practices 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 less need for agrochemicals. The visit served as a backdrop to illustrate the practical application of the themes covered



in the course in an actual farm setting, which provided participants the opportunity to interact with property owners and ask questions.

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

Belgis Madrid provided the participants with an introduction about the experience of creating and managing a community-based group. Belgis discussed APASPE's process of becoming a legally recognized organization, the planning and application for project funding, the implementation and management of their project and the strategies for disseminating information to the community and region. A separate session was developed to provide an informal discussion between Belgis and the participants, on the challenges of managing a community organization and opportunities to work with local ministries and other organizations to advance their efforts.

- **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 an example of how to conduct a farm diagnostic. Participants were split into groups and asked a series of questions that obligated them to make observations about the farm and develop strategies that were adequate for the farm and owner's constraints.



The final exercise built off of the diagnostics exercise, by utilizing the same method to recognize the strengths, weaknesses and opportunities of their own farms. 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; riparian areas (streams, rivers and natural springs), forest cover (secondary forests, gallery forests and living fences), productive agricultural areas (forage banks, pastures, annual crops) and areas of low agricultural output (steep hills, gullies, erosion prone areas). They were then asked to discuss and draw the types of restoration strategies that could be completed on their farm while considering the site conditions on-farm, 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. While many strategies were discussed, one theme in particular focused on how to utilize natural regeneration of beneficial species in order to promote more economically feasible efforts to; 1) establish silvopastoral systems; 2) promote forest recuperation in highly sloped land not adequate for agriculture; 3) improve gallery forest diversity; 4) increase the width of riparian buffer zones; and 5) establish natural forests for timber and non-timber forest product production. This 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 and in the field at the demonstration sites. In addition, course collaborators: Jaime Madrid of IDB Forestal, and Belgis Madrid, Zoilo Vergara 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 a basic understanding of forests and how they influence the provision and regulation of the ecosystem services that they as farmers depend on for their livelihoods. The audience for the course was focused local community leaders from the La Villa and Oriá Rivers Watersheds regions, two critically important watersheds of the Azuero Peninsula, one of which (La Villa River) has resulted in high agrochemical contamination rates in 2014, leading to a state of emergency and a formal human rights complaint to the Inter-American Commission on Human Rights (IACHR) of the Organization of American States (OAS). In total twelve participants attended. In addition, the field portion of the sustainable ranching module was also attended by two Peace Corps staff members.

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 need for ecological restoration courses for local landowners in the Azuero Peninsula, who due to a lack of information, continue with conventional practices that are harmful for the environment.

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.