

## COURSE REPORT

# Sustainable Cattle Ranching in the Santa Maria River Watershed as a Measure of Adaptation to Climate Change

ELTI Training Landscapes  
District of Pedasí, Province of Los Santos  
December 16-20, 2019

### A field course organized by:

The Environmental Leadership & Training Initiative (ELTI) and the Association of Livestock and Agrosilvopastoral Producers of Pedasí (APASPE) in collaboration with the Group for Education and Sustainable Environmental Management (GEMAS)



Photo: Eli Wittum

Participants learn about sustainable ranching practices during a visit to an APASPE model silvopastoral farm.



ESTRATEGIAS PARA  
LA RESTAURACIÓN ECOLÓGICA

**Background:** According to the Food and Agriculture Organization of the United Nations (FAO 2014), 27% of Panama's lands are considered "dry and degraded," caused mainly by unsustainable conventional cattle ranching. Panama's Santa María River Watershed, which consists of over 200,000 hectares of land shared by three central provinces and one indigenous reservation (Veraguas, Herrera, Coclé and Ngöbe Buglé, respectively), has over 50% of its land use focused on conventional ranching (INEC 2010). Much of the watershed has been deforested and degraded, resulting in the loss of ecosystem services, especially potable water and irrigation uses, thus negatively affecting public health and rural livelihoods.

ELTI is an initiative of:

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Photo: Eli Wittum

Participants learn about how forests function and the important services they provide, which can help to make cattle ranching systems more resilient.

As an alternative to conventional cattle ranching, silvopastoral systems (SPS) incorporate diverse trees and intensifies natural processes to conserve biodiversity but also increase on-farm yields. In order to facilitate a change in sustainable land-use, farmers need to have a better understanding of the principles of ecological function and how silvopastoral practices can be integrated into traditional ranching livelihoods. To build this capacity, since 2013 ELTI has offered hands-on, field-based courses that teach the fundamentals of sustainable ranching strategies for landowners to restore forest cover and protect water sources. ELTI utilizes their Training Landscapes, located in the Azuero Peninsula, which teach restoration principles through its network of model farms and demonstration sites.



Photo: Eli Wittum

APASPE member Dolores Solis discusses the different ecological restoration strategies he has implemented on his farm to conduct more sustainable ranching.

Participants of this course were selected from farmers who are implementing silvopastoral systems via their participation in the project: *Sustainable Livestock in the Middle and Lower Watersheds of the Santa María River as a Measure of Adaptation to Climate Change*. The project, financed by the Adaptation Fund “seeks to support and strengthen the capacities and skills of small livestock producers, located in the middle and lower watersheds of the Santa María River, so that they can implement climate change adaptation measures and with them, achieve climate resilience and environmental quality in its productive systems through the establishment of silvopastoral systems, increased pro-

ductivity, and restoration of the connectivity of livestock landscapes.” Over a period of five days, this course provided the practical basis to understand how to increase farm resiliency with ecological restoration strategies such as SPS and others.





Participants conduct a diagnostic of their farm as a first step of the farm planning exercise.

**Course Objectives:** The overall goal of the course was to educate participants on the role that forests play in providing ecosystem services and the range of sustainable ranching strategies that can be integrated into livestock landscapes in order to conserve important water sources while also enhancing production. Additionally, all participants were guided in the process of developing a farm management plan as a first step of planning to participate in the project.

**Content:** The course was divided into six training modules, illustrated through guidebooks and case studies, introductory lectures, field-based demonstrations, and group exercises facilitated by ELTI staff and APASPE members, as follows:

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

**Module 2: Forest degradation and limitations for restoration**

**Module 3: Strategies for the restoration of ecosystem services in cattle ranching landscapes**

**Module 4: Silvopastoral systems as a tool to achieve sustainable cattle ranching**

**Module 5: The role of community organizations in ecological restoration**

**Module 6: Development of a farm management plan**

**Field-Course Format:** This course took place over five days at ELTI's Training Landscapes in the tropical dry forest, located in the Los Santos Province of the Azuero Peninsula. ELTI's sites demonstrate the varied biophysical and socio-economic contexts of different types of land use: (1) the Achotines Forest Reserve, a tropical dry forest ecosystem with both old growth and younger secondary forest; and (2) the APASPE model farms, which are privately-owned by members who have established silvopastoral systems, practice sustainable cattle ranching and other forms of forest conservation on-farm. Due to the size of the group, the participants were divided into two groups, each group corresponding to 2.5 days in the field. The following activities occurred throughout the week:



Participants from the first group of producers and ELTI Staff.

**Day 1:** Course participants arrived at the Achotines Tuna Laboratory and were introduced to the laboratory's activities. Saskia Santamaría (Neotropics Training Program Associate) facilitated an introductory presentation about ELTI and the objectives of the course. Jacob Slusser (Neotropics Training Program Panama Coordinator) led a field walk through ELTI's interpretive trail system, within the Achotines Forest, where he discussed tropical dry forest ecology, including species identification, functional characteristics, forest regeneration and succession, and the range of ecosystem services that forest ecosystems provide. Parti-

cipants gained a better understanding of the species, interactions and processes that occur to maintain the biodiversity necessary to maintain equilibrium in ecosystems.

Afterwards, Jacob delivered an introductory lecture about sustainable ranching methods that integrate trees into pastures via silvopastoral systems (SPS). Jacob presented SPS as a practical and ecological way for farmers to conduct their livelihoods in a more environmentally friendly manner, while also utilizing natural ecological processes to lower their costs of production and develop more climate change resilient farms.

Next, participants began the process of working on their farm management plans, which are a first step and requirement for their participation for the project. Jacob presented an introductory lecture on the ten-step process, using an example farm to conduct the different phases. Afterwards, participants worked with the guidance of ELTI Staff to do the following: define their ideal farm, list basic information about the property, draw a farm map illustrating its layout and rate their current farm on a 1-5 scale of sustainability via 12 different production and conservation indicators. Participants then plotted their results on a web to visually understand the current level of their farm's resilience. The second part of the farm plan would be conducted the following day after field visits concluded.

**Day 2:** Participants traveled to the small town of Los Asientos to meet APASPE members and visit the El Ñopo Farm of Odielca Solís, APASPE Treasurer. They were given a tour of the farm by Odielca, visiting several restoration areas and new technologies including: solar powered cattle aqueduct system, drip irrigation agroforestry system with shade coffee, mixed forage bank, intensive silvopastoral system, restoration of riparian areas via natural regeneration and native tree species reforestation conducted in a wildlife corridor. During the visit, Odielca discussed many of the challenges and lessons learned from implementing sustainable ranching activities over the past six





Photo: Jacob L. Slusser

APASPE member Odielca Solís explains how to select seeds and plant "botón de oro," a fast growing forage species.

years. Jacob and Jorge Gutiérrez (Field Technician) provided additional technical information about the systems when needed. Participants were very impressed with the productive results from such a small farm and were inspired by Odielca's efforts as a single mother as well as her passion for being a steward of the land.

Afterwards, participants visited the Los Yescos Farm and were provided a tour by owner and APASPE member, Dolores Solís. During the visit they learned about the restoration strategies conducted including; a home garden, silvopastoral systems and agro-successional systems integrating timber, agricultural crops and cattle forage species. Participants were inspired by the way Dolores had successfully esta-

blished more native tree species into the farm while also producing food and forage in the same area. Additionally, the simple solar powered cattle aqueduct system demonstrated the ease of guaranteeing permanent water and efficient usage on farm. Finally, learning how Dolores was able to improve the farm management and provide water and forage all year for his cattle by utilizing silvopastoral systems, demonstrated the effectiveness of these systems. Overall, the opportunity to visit the model silvopastoral farms established by two local farmers was an educational and inspiring experience for the participants who are embarking in a similar project themselves.

After lunch, participants returned to Achotines to continue working on their farm management plans. Based on how their farm was rated via each indicator, they prioritized which areas they wished to improve and developed their work plans accordingly. In the work plan, participants listed the indicator, the reasons why their farm scored low in that area, what were the corrective actions and what specific activities would be conducted. Most farm plans focused on improving water systems and forage, increasing trees in pastures and protecting water sources. Additionally, participants listed the resources (labor and materials) needed for each intervention and a work calendar for each activity. Finally, farm plans were completed by drawing a new map of how they envisioned the changes in the five hectares of their farm which would be conducted as part of the project.

**Day 3:** Participants were awarded their certificates and a group photo was taken. Afterwards they returned to the city of Chitré and the second group of producers departed to Achotines to begin the same activities that the first group had conducted.



Participants from the second group of producers and ELTI Staff.

**Instructors and Coordinators:** The course was facilitated by ELTI's Neotropical Training Program Staff: Jacob Slusser (Panama Coordinator), Saskia Santamaría (Program Associate) and Jorge Gutiérrez (Field Technician). Jacob delivered introductory lectures and field demonstrations on the concepts of ecosystem services, forest ecology, restoration strategies and sustainable ranching systems. Saskia introduced the ELTI program and the course objectives to the participants, while also coordinating logistical components of the course. Jorge focused on providing technical information about the establishment of silvopastoral systems. Jacob, Saskia and Jorge facilitated the farm management plan activity and worked directly with participants. APASPE members Odielca Solís and Dolores Solís facilitated model farm visits, explaining in detail the variety of restoration strategies and sustainable systems established. Eli Wittum (Peace Corps Response Volunteer) documented the event by recording video and photography.

**Participants:** The course was offered to a total of 26 participants. The 26 producers were from the Province of Herrera, who are participating in the project *"Sustainable Livestock in the Middle and Lower Watersheds of the Santa María River as a Measure of Adaptation to Climate Change."*

**Course Follow-up:** Participants of this course will be provided follow-up field visits and trainings from GEMAS field technicians and Panama's Ministry of Agricultural Development (MIDA) extension agents in order to plan, execute and monitor the farm plans developed during the ELTI training course.

**Cost:** This course was offered at no cost for 26 selected participants thanks to the support of the Adaptation Fund and implemented by the Fundación Natura and MIDA and the consortium for project implementation led by GEMAS.

*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.*