Environmental Leadership & Training Initiative

COURSE REPORT

Theory and Practice for Engaging Landholders and Communities in Conserving and Restoring Tropical Forest Landscapes

ELTI Training Landscapes
District of Pedasí, Province of Los Santos
March 20-25, 2023

A field course organized by:
The Environmental Leadership & Training Initiative (ELTI), the Yale School of the Environment (YSE), and the Association of Livestock and Agrosilvopastoral Producers of Pedasí (APASPE)

Students meet with the manager of the Eco Venao ecolodge and learn how they integrate forest restoration into their business model.

Background: The tropical dry forest, the most endangered ecosystem in the Neotropics, is extremely threatened by extensive, treeless cattle ranching practices in Panama's Azuero Peninsula. The degradation of forest landscapes has impaired the provision of ecosystem services – necessary to support local agrarian livelihoods. With an erratic annual rainfall and a dry season lasting from five to six months, the region's extreme climate variations compound the stresses of unsustainable land-use practices. Efforts to restore the ecosystem, therefore, are particularly challenging. Integrating forest restoration strategies into agricultural mosaics have

Students visited the Bay of Panama and the Costal Beltway in Panama City.

proven to enhance on-farm production and ecosystem services. However, successful approaches require engaging with landowners and communities to incorporate their perceptions, values, and objectives into holistic restoration interventions that provide benefits for local communities and biodiversity.

To provide a field experience focused on the socio-ecological aspects of forest restoration, this training was offered to masters students enrolled in the Yale School of the Environment (YSE) course 615 entitled, "Theory and Practice for Engaging Landholders and Communities in Conserving and Restoring Tropical Forest Landscapes." Over a period of six days, students learned from ELTI team members and local experts about the ecology of tropical dry forests, how and why these ecosystems have been degraded over time, and the distinct historical, cultural, and the socio-economic factors that shape and influence land management practices in the region. Students also visited a network of field sites that showcase a range of forest restoration and sustainable cattle ranching strategies that a diversity of landholders are adopting in the region with support from ELTI. Particular attention was given to the social aspects of conserving and restoring this unique forest type and how and why landowners and community associations facilitate and promote restoration activities on-farm. Students also interacted with local Panamanian NGOs conducting wildlife conservation at the local level as well as the national policy level regarding Panama's 1-million-hectare reforestation, its Bonn Challenge pledge, much of which is being implemented within complex agricultural mosaic landscapes of the Azuero Peninsula.

This field-based course was facilitated at ELTI's Azuero training landscape located in the Province of Los Santos in the Azuero Peninsula, which conveys ecological and social principles of forest restoration through its interpretative trail network, demonstration sites and model farms.

Course Objective: The course aimed to provide an engaging and practical field experience to students to complement the seminar course by demonstrating both biophysical and social approaches to tropical dry forest restoration in complex human dominated landscapes of a developing Central American country.

Jacob Slusser

A ship being lowered to the elevation of the Pacific Ocean in the Miraflores Locks.

Content: The course was divided into five training modules, illustrated through introductory lectures, field-based demonstrations, discussions, and group exercises, as follows:

Module 1: Panama's political ecology context
Module 2: Tropical dry forest ecology and ecosystem services
Module 3: Ecological and social consequences of deforestation and degradation
Module 4: Forest restoration strategies for sustaining livelihoods in human dominated landscapes
Module 5: The role of community-based farmer organizations in forest restoration

Field-Course Format: The course took place over six days, starting in Panama City and the remainder at ELTI's training landscapes on the Azuero Peninsula. These sites demonstrate the varied biophysical and socio-economic contexts of different types of land use ranging from well conserved mature forest to model farms established with silvopastoral and agroforestry systems, home gardens, and riparian forest restoration. The following activities occurred throughout the week:

Day 1: The first day of the course took place in Panama City, to orient students to the political, economic and ecological history of Panama and how it has influenced the current context. Introductions to the course were conducted by Jacob Slusser (Panama Coordinator) at the Panama Viejo ruins, where the origins of the city were described. Afterwards, students were given a tour of Panama City, stopping at historical sites such as Casco Viejo, the Causeway, and the former Canal Zone.

Lunch was offered at Niko's Café, a traditional Panamanian restaurant. Students met George Hanily, the Director of the Panama's oldest conservation NGO, the National Association for the Conservation of Nature (ANCON)

Students visit a mature tropical dry forest standin the Achotines Forest Reserve.

and YSE alumna and former Minister of the Environment of Panama, Mirei Endara. Both candidly spoke about their careers working in the environmental conservation sector in Panama, highlighting Panama's challenges and their experiences. Students inquired about the difficulties to facilitate restoration at the government and NGO level and how to effectively engage with a diversity of stakeholders, while meeting target restoration goals.

After lunch, students visited the Miraflores Locks of the Panama Canal, where they watched an IMAX film titled "Panama: Land Divided, World United," which described the history of the canal and how it has shaped Panama as a country and its important role as a facilitator of world commerce. Students then watched ships pass through the Miraflores Locks. The day concluded with a traditional dinner and folkloric dance presentation at El Trapiche, a local Panamanian restaurant.

Day 2: The group departed Panama City and traveled the five hours to the Achotines Tuna Laboratory, a research station of the Inter-American Tropical Tuna Commission (IATTC), located on the south coast of the Azuero Peninsula. Students arrived and toured the installations. Afterwards, Jacob presented on ELTI's capacity building model in Panama, discussing the need for training, audience profiles, types of courses and the development of ELTI's Training Landscapes to facilitate interactive field-based courses.

Afterwards, students visited Eco Venao Lodge, a 140-hectare reforestation project that offers ecological lodging at *Playa Venao* (Deer Beach), a popular tourist destination. Students received an informal presentation by Nico Nickson, co-owner, who discussed the business's objectives, offering more sustainable alternatives for lodging in an increasingly developing area. Their practices include conserving forest patches, reforesting native and exotic tree species, and offering minimal impact lodging via low density construction – structures made from locally sourced materials, and use of renewable energy from a site-based solar electricity project. Students had the opportunity to ask questions about tourism development in the area, hiring local people from the community and how other hotels also focus on sustainability. Overall, the visit provided students with the perspective, values, and approach of a foreign landowner to facilitate a hospitality business that conserves the local ecosystem, integrates local communities, and generates economic profit.

Day 3: Jacob presented a lecture on the social and economic history of deforestation and degradation drivers of tropical dry forests of the Azuero. His presentation provided a background on the livelihoods and common land uses in the landscape and the barriers to implement forest restoration. Afterwards, the group

Odielca Solís, owner of El Ñopo Farm describes the range of restoration strategies she has conducted on her cattle farm.

traveled to Los Asientos to meet Alcibiades "Chivi" Vergara and his wife Edelmira, who are from two of the families that settled the area in the early 1900s. The couple provided a historical perspective on how and why the area transformed from forests into agriculture and cattle pasture landscapes. They also focused on different gender roles and the land use changes that occurred over the past decades. They also visited the family's stables and traditional home garden, which illustrated their knowledge of animal husbandry and traditional use of trees and plants on-farm.

After lunch, Jacob presented about tropical dry forest ecology, to describe the forest composition and dynamics and help students identify key plant species and their traditional uses. To complement the presentation, Jacob led a walk on ELTI's ecological trail network, within the Achotines Forest Reserve. Students learned about a mature tropical dry forest, its seasonal and structural characteristics and visualized the type of ecosystem which farmers originally encountered in the area over a century ago. Students also visited different demonstration areas to learn about the flora and fauna and how the trees interact and recover after disturbances. Jacob stressed learning how to identify the key tree species in the forest as well as their functional characteristics, which are related to their conservation and propagation in local farms.

Day 4: The course shifted to focus on forest restoration strategies for tropical dry forests. Jacob delivered an introductory presentation about the range of passive to active forest restoration strategies, highlighting many of the restoration activities conducted by local landowners. He described silvopastoral and agroforestry systems, which are strategies that have proven successful for local cattle farmers to enhance their traditional livelihoods and improve ecosystem health.

After the lecture, students were given a tour of Eco Venao. Students learned about their methods to lower their ecological impact via a solar energy project that provides the site with most of its electricity demand, a permaculture project that reintegrates organic waste from the kitchen and provides fruits and vegetables for the onsite restaurant. Afterwards, the students spent the afternoon enjoying the nature trails and beach.

Day 5: The day focused on community groups and their efforts to conduct forest restoration strategies. Students spent the day meeting with the APASPE members, Odielca Solís – Secretary, Manuel Cedeño – Treasurer, and Dolores Solis. Participants also met Jorge Gutiérrez – ELTI's Field Technician, who provides follow-up assistance to ELTI alumni.

Students visited Odielca Solis' farm, a small cattle farm that is intensively managed. She described the evolution of the farm on how her efforts focus on producing beef cattle as well as annual crops, fruit, and coffee – some of which is sold in local markets. Students inquired about why Odielca made the decision to convert her conventional farm to a regenerative system. Odielca stressed both the ecological and social benefits of silvopastoral and agroforestry systems, but also highlighted how the process was difficult since it

Students pose for a photo during a farm visit.

was a system that required a high initial investment despite the area's labor shortage. Students were very interested in her experience as a single mother working in a male-dominated sector and how she has overcome social and economic barriers. Odielca emphasized that women have a different land-use ethic and are sometimes better land stewards than men, which she illustrated with the diversity of products and high yields from her farm.

After lunch with the association members, the students received a presentation from Diosa Castro, ELTI alumna and the Treasurer of the Save A Tree Live Better (SAVIM) Ecological Producer's Association. SAVIM is another community-based association that consists of ELTI alumni and have received numerous years of support from ELTI to become recognized as local environmental leaders in conservation and sustainable ranching. Diosa discussed the history of the association and learning about forest restoration and difficulties of receiving support for projects. She mentioned the support from the Small Grants Programme to establish silvopastoral systems and rainwater harvesting systems – to incentivize restoration efforts in their community, which now serves as an example for their region of the Azuero. Diosa also articulated the importance of restoration efforts to improve the local ecosystem and their agrarian livelihoods by increasing and sustaining production.

After the presentation, students visited the farm of APASPE member Dolores Solís, who utilizes several restoration strategies to improve production while conserving soil and water on his farm. Students visited the different areas where he has conducted native species reforestation and inquired about his management of the trees which have grown quickly in a short time.

Throughout the day students had the opportunity to inquire about local cultural and political issues related to restoration and sustainable ranching and the hardships of living an agrarian livelihood and the lack of assistance they receive from the authorities. Overall, the exchange provided students with a clear understanding of the complexities of conducting forest restoration in an agricultural landscape, where there are diverse landowners with differing values and objectives. It also highlighted the importance of providing farmers long-term training and leadership building to ensure long-term restoration impacts.

After the day's visits, students returned to the main plaza of Los Asientos and enjoyed dinner and the performance of a traditional accordion and bongo drum musical group.

Day 6: After breakfast, the students departed for Panama City. After lunch, Claudia Alvarado, Manager of Sustainability for Nestle Central America provided her experience with conservation and restoration efforts to improve value chains in the private sector. Students inquired about her career trajectory and the challenges of conducting sustainability efforts for a large multi-national corporation. Special attention focused on Nestle's efforts to increase biodiversity conservation efforts with the producers of their raw projects, to lower their carbon footprint and increase regenerative activities on farm. The course concluded with a final dinner in Panama City.

Students take a break while hiking the ELTI ecological trail in the Achotines Forest Reserve.

Instructors and Coordinators: The course was facilitated by ELTI's Neotropical Training Program staff: Jacob Slusser, MSc. (Panama Coordinator), Jorge Gutiérrez (Field Technician) and Saskia Santamaría (Program Associate), with support from Dr. Eva Garen (ELTI Director). Jacob delivered introductory lectures and field demonstrations on the concepts of ecosystem services, forest ecology, degradation drivers, restoration strategies and sustainable ranching systems. Jorge provided technical information about the establishment of silvopastoral systems. Saskia coordinated the logistical and communication components of the course. APASPE members Odielca Solís and Dolores Solís facilitated model farm visits, explaining in detail the regenerative strategies used on their farms and the success and challenges they faced. SAVIM member Diosa Castro provided an introductory lecture and experiences implementing restoration interventions.

Participants: The course was offered to 14 master's students from the Yale School of the Environment who were enrolled in the YSE course 615 entitled, "Theory and Practice for Engaging Landholders and Communities in Conserving and Restoring Tropical Forest Landscapes."

This event was possible thanks to Arcadia, whose Environmental Conservation grants support programmes that protect and enhance biodiversity, and provide field training and academic research.