

COURSE REPORT

Training of Trainers:

Ecological Restoration Strategies for Agricultural Landscapes of Panama

Province of Chiriquí, Panama

September 1-3, 2019

A field course organized by:

The Environmental Leadership & Training Initiative (ELTI) and the United States Peace Corps



Photo: Eli Wittum

Participants learn how to conduct a rapid assessment of a degraded pasture in order to develop forest restoration strategies.

Background: The Republic of Panama is known for providing a critical link in global trade via the Panama Canal, as well as its recent impressive economic growth within Latin America. Despite this progress, Panama suffers from stark economic disparities. Extreme poverty is still high in rural areas at 27%, while indigenous territories are above 40%¹. Economic opportunities in rural areas are sparse and landowners often rely on conventional agriculture and cattle ranching practices

1. World Bank Panama Profile: <http://www.worldbank.org/en/country/panama/overview>

ELTI is an initiative of:

Yale SCHOOL OF FORESTRY &
ENVIRONMENTAL STUDIES



Photo: Eli Wittum

Participants review native tree species seeds and learn about their phenology and how to break dormancy for planting in a seed germinator bed.

that involve the cutting and burning of forests to plant annual crops and pasture grasses. When practiced on marginal, steeply sloped land, soils quickly erode and lose fertility, leading to low agricultural production, decreased ecosystem integrity, and few social benefits. As a result, the Food and Agriculture Organization (FAO) (2014)² estimates that 27% of Panama's agricultural lands are dry and degraded, which severely impairs the ability of these areas to generate the range of ecosystem services necessary to support sustainable production systems including soil fertility, provision of water, carbon sequestration, and biodiversity.

Given this context, rural landholders can benefit from capacity building and access to information about more sustainable land use practices, especially considering changing climatic conditions. Invited by the Panamanian Government, the United States Peace Corps helps to address this need by sending professionals to "serve as Peace Corps Volunteers (PCVs), who work at the grassroots level toward sustainable change that lives on long after their service."³ Volunteers are assigned for a two-year period to rural communities that request assistance from the Peace Corps. The cultural exchange and development assistance that PCVs provide is critically important for improving human capacity, providing better opportunities for rural people and sharing goodwill between countries.

To strengthen the technical background of PCVs from the Community Environmental Conservation sector in their role as environmental conservation extension agents, ELTI delivered a "training of trainers" (TOT) course, which was facilitated as part of the Peace Corps Panama's "In-Service Training," a two-week technical training offered to PCVs after serving six months in their respective communities.

2. Panama America (11/20/2014): <http://www.panamaamerica.com.pa/economia/27-de-deterioro-registran-algunas-tierras-del-pais-953263>

3. United States Peace Corps Website: <https://www.peacecorps.gov/volunteer/>



Participants practice filling nursery bags with seedling substrate composed of organic soil, rice husk and organic fertilizer.

Course Objectives: The general objective of this training of trainers (TOT) course was to provide PCVs with the basic knowledge and skill sets needed to teach and facilitate forest restoration strategies with community counterparts in their host sites. Since the communities are comprised of a mosaic of agriculture and cattle ranching systems, the course focused on introducing a range of strategies that can help to restore ecological function to create landscapes that are more resilient to climate change. The course also focused on providing PCVs with the tools to disseminate and train others on how to utilize restoration knowledge and skills.

Content: The course was divided into three training modules, illustrated through introductory lectures, field-based demonstrations, and group exercises facilitated by ELTI Staff and guest experts:

Module 1: *Forest ecology, disturbance and degradation*

Module 2: *Forest restoration conceptual model and range of strategies*

Module 3: *Technical approaches to native tree species propagation and reforestation*

Field-Course Format: This course took place over three days. The first day focused on introductory presentations, followed by two days of field-based activities. Due to the size of the group, the 20 participants were split into two groups, each group corresponding to one day in the field. The course included the following specific activities:



Photo: Eli Wittum

Farm owner Ramón Batista discusses how he manages his shade coffee

Day 1: Participants visited the agroforestry farm of Ramón Batista, a coffee producer and member of the Association of Producers of Renacimiento (APRE). Ramón discussed the history and objectives of his farm, detailing how he has transformed his farm with more ecological practices. Participants also learned about coffee producers in the region, including the history of coffee production and new challenges farmers are facing due to climate change. The visit provided an opportunity for volunteers to become more familiar with the tree, shrub and bamboo species that are utilized in agroforestry systems and the types of strategies that producers are using to conduct ecological restoration and enhance their traditional livelihoods. After lunch, Jacob Slusser, Neotropics Training Program Panama Coordinator, facilita-

ted presentations about ELTI and ecological restoration. He discussed tropical forest ecology and restoration approaches, which covered both theoretical and practical methods of restoring forests in human-dominated landscapes. The presentations also included case studies and practical approaches to communicating forest restoration to landowners. Volunteers discussed the barriers they have faced in their communities and received feedback on how to overcome them.

Day 2: Participants returned to the farm of Ramón Batista to learn more about native tree species propagation and practical approaches to reforestation in degraded areas. Before commencing, Jacob reiterated that reforestation should always be the last option when developing a forest restoration strategy due to its complexity and high cost in terms of time and resources. Jacob started by leading a session about the factors to consider and steps to construct a small-scale community tree nursery. Next, PCVs constructed a seed germinator bed, learning about different species, their phenology, seed types, storage and scarification processes. Once the bed was constructed and disinfected, participants practiced scarifying seeds and varied planting practices. Participants also learned about making substrate and practiced mixing and filling bags. Finally, participants transplanted seedlings from the seed germinator bed into prepared bags. To conclude the nursery session, Jacob stressed the importance of carefully selecting tree species for reforestation projects based on their ecological and social importance, since selected tree species must be able to function in degraded site conditions as well as have value for local people.



Photo: Eli Wittum

Peace Corps Panama Staff and volunteers practice tree planting techniques learned during the course to reforest a degraded riparian area of a farm.

For the reforestation activity, Jacob led a field-based session to demonstrate different tree planting techniques and had participants plant trees in a designated riparian area of a local farm. Jacob demonstrated practical strategies for establishing different reforestation plots and sizes, utilizing simple tools such as a roll of twine and lightweight three-meter PVC tubes to quickly and accurately measure out planting distances. Afterwards, Jacob discussed best planting practices, specifically calling attention to digging 40-centimeter holes to breakup compact soils and planting saplings with high amounts of organic material or with nearby forest soils which contain beneficial microorganisms. He also discussed post-planting maintenance including fertilizing, mulching with cardboard, and digging mini-swells and barrier walls for sediment and water catchment as well as more long-term silvicultural management via pruning and thinning. Participants then worked in teams to plant 75 trees in a degraded spring that had been selected by the property owner in order to restore.

Day 3: The same field-based activities were conducted for the second group of 10 volunteers. At the end of each day, time was reserved for reflection and discussion, especially to review strategies for communicating climate change and forest restoration themes to community counterparts. Participants also completed course evaluations.

Participants: This course was developed for 20 Peace Corps Volunteers serving in Panama as extension agents in the Community Environmental Conservation sector. These PCVs serve for over two years in rural communities of Panama, assisting landholders and local groups in designing, planning and implementing biodiversity conservation and forest restoration projects.



Photo: Eli Wittum

Participants learning about native species tree propagation from an ELTI guide book.



A group photo of course participants and farm owner Ramón Batista, at the end of the training session.

The course was developed and facilitated by Jacob Slusser, ELTI's Neotropics Training Program Panama Coordinator, with the assistance of Peace Corps Panama staff and "the Association of Producers of Renacimiento (APRE). Local landowner and APRE member Ramón Batista, facilitated visits during the training and Peace Corps Panama Staff Members Francisco Santamaría, Leyla Wittgreen and Sara Caez Rivera also assisted in sessions during the training. Eli Wittum, Peace Corps Response Volunteer who serves as ELTI's Multi-Media Specialist, documented the event by taking photos and video of the event.

Outcomes and Follow-up: Participants were actively engaged throughout the course and were grateful for the opportunity to receive practical training on forest restoration strategies, which is of high interest in their communities. Participants rated the course a 4.8 out of 5. Many PCVs expressed interest in attending ELTI's 5-day forest restoration course offered at the Azuero Training Landscapes. In addition, PCVs discussed possible ideas for participating and requesting assistance from ELTI's Leadership Program to develop restoration projects in their communities.

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.