



1.2 Sustainable ranching and restoring forests in agricultural landscapes, Panama

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Introduction

In Panama, conventional cattle-ranching practices have led to the degradation of more than one-quarter of the country's agricultural land. Cattle ranchers in Panama have little access to information about sustainable practices, and lack the economic support and incentives to implement them. In 2010, the Association of Livestock and Agro-Silvopastoral Producers of Pedasí (*Asociación de Productores Pecuarios y Agro-silvopastoriles de Pedasí*, or APASPE) was the first community-based sustainable cattle ranching association to be established in Panama. Its mission is to improve on-farm productivity and increase the integrity of ecosystem services by restoring forest cover in degraded landscapes.

As pioneers in sustainable cattle ranching, APASPE members faced many technical, cultural and financial hurdles. To support them, the Environmental Leadership and Training Initiative (ELTI) at Yale University began training and leadership activities, supported APASPE to create a project funding strategy, and provided on-site technical assistance to establish model farms. Despite many setbacks and challenges, APASPE members have learned how to better manage their association and implement a sustainable ranching project. Through this experience, many members are now local experts on sustainable ranching and forest restoration, and they train ranchers and extension agents throughout the country.



INVESTING IN BUILDING CAPACITY
AND FOREST AND FARM PRODUCER
ORGANIZATIONS EMPOWERS
LAND-OWNERS TO MAKE POSITIVE
LAND-USE DECISIONS.

The Panamanian context

Conventional and extensive cattle ranching systems are the last productive resort before abandoning degraded lands. Land degradation is the result of prior agricultural failures that drove deforestation (Murgueitio 2004). Cattle ranching relies on cutting trees,

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repeated burning and use of agrochemicals, which quickly degrade soils and ecosystem functions. From 1960 to 2000, Central American forests were reduced by more than 40%. Panama was no exception, and forest degradation has continued, although forest loss has decreased since 2000. Today, 27% of Panama's once arable land is now considered degraded; overgrazing is the primary cause.

The Dry Arch region of the Azuero Peninsula is one of Panama's most critically threatened ecosystems. It comprises dry tropical forests with limited rainfall and a pronounced dry season of five to six months, making it particularly vulnerable to the impacts of climate change. As a result of unsustainable practices, the area has suffered high levels of environmental degradation. This has led to widespread economic losses in the agricultural sector and the degradation of ecosystem services that local people rely on.



A sustainable alternative

Although it is widely believed that trees in the landscape interfere with cattle production, evidence shows that tree cover can improve productivity (e.g., Garen et al. 2011). Colombia's Centre for Research in Sustainable Agricultural Production Systems (CIPAV) demonstrated that integrating trees and shrubs into livestock production increases the amount and diversity of forage for cattle, and also provides timber and non-timber forest products. Increasing tree cover in pastures also restores degraded grazing lands, protects soils and riparian areas, and increases biodiversity. Silvopastoral systems also maintain and regulate critical ecosystem services for forage and livestock production, such as moderating microclimates, cycling nutrients and hydrological factors, and supporting pollination and pest management (Murgueitio et al. 2011). This more sustainable form of ranching is not commonly practiced in the Azuero Peninsula, however, due to a lack of technical knowledge, limited economic incentives to implement it, and widespread cultural and traditional beliefs that oppose the presence of trees in pastures (Slusser, Calle and Garen 2014).

ELTI's approach to promoting alternatives

ELTI has supported forest and farm producer organizations in Panama's Azuero Peninsula since 2009, when it held its first course on incorporating native trees into the landscape. Several farmers from the District of Pedasí had previously taken part in a native species reforestation project (PRORENA) and were keen to learn about agroforestry (Garen et al. 2009). After this first training session, they identified silvopastoral systems as most relevant to their region's main economic activities, and requested assistance to implement them.

In response, ELTI partnered with CIPAV; their goal was to introduce local producers to more sustainable alternatives to cattle production through a series of training courses and leadership initiatives that focused on silvopastoral systems. The first session was a three-

day field trip to visit six model farms in another region of Panama, where agroforestry areas had previously been established with CIPAV's technical assistance. Facilitated by CIPAV, these training sessions provided abundant opportunities for farmer-to-farmer learning. When the farmers returned to their communities, a small group of them were determined to plant their own silvopastoral systems. They once again asked for support.

A sustainable ranching forest and farm producer organization

During the first ELTI course, the Panama representative of the Global Environment Facility's Small Grants Program expressed his interest in supporting community-based forest restoration and sustainable agriculture projects in the Azuero region. However, he stressed that — as was the case with other international donor agencies — grants could provide support only to legally recognized cooperatives. This provided an incentive to form a cooperative. ELTI provided motivation and assistance as the group of farmers navigated the bureaucratic process to legally register an association, form an executive board and set up a bank account. In 2010 APASPE was legally recognized.

Since the beginning, APASPE's Executive Board has been the main force that drives project implementation. The board consists of four members: a president, secretary, production secretary and treasurer; they have held these positions since 2011. Three are the youngest members of the association (in their late 30s), and all four have post-secondary school education; most other members have only primary school education. Board members receive no financial compensation and all have full-time jobs in addition to responsibilities on their farms.

The Executive Board's primary responsibilities are to provide leadership for the association's development, and manage project resources so they are allocated according to requirements. APASPE holds monthly meetings to discuss progress and plan for upcoming planting seasons. Individual members can request specific agricultural inputs needed for their farms, such as fencing materials, pasture seeds, agrochemicals, organic fertilizer and tree seedlings. To receive these, members must meet two criteria: they must develop a farm management plan, and must fence or plough the plots. The board monitors progress and provides or requests technical support from ELTI and CIPAV as needed. It submits financial and progress reports directly to donors, and holds quarterly progress meetings.

Initial successes

ELTI and CIPAV conducted a two-day workshop to collect members' input to a draft project proposal to implement sustainable ranching systems that would improve cattle productivity and protect water sources in Los Asientos County. The idea was that in exchange for protecting water sources on their farms through fencing and reforestation, farmers would receive technical and material support to establish silvopastoral demonstration plots. These plots



could then be used as examples to disseminate knowledge to other ranchers. The workshop also provided a venue to discuss and better articulate a clear mission and objectives for APASPE. CIPAV and ELTI provided expertise in drafting a proposal to meet the funders' technical standards, but the project fully reflected APASPE members' vision and interests.

APASPE then submitted its first proposal, for a sustainable ranching and riparian area restoration project. The group received US\$27,000 in 2012 to carry out five tasks:

- conserve three kilometres of riparian area;
- establish 18.5 hectares (ha) of silvopastoral systems;
- reforest degraded areas with 10,000 native trees;
- participate in ten forest restoration training sessions; and
- facilitate eight outreach events with communities in the region.

Early hurdles

As part of the project, ELTI facilitated eight practical training courses with help from CIPAV technicians. Despite these efforts, implementation soon fell behind schedule. Workshop participation was consistently low, and even those who attended felt uncertain about applying the techniques on their own without on-site professional guidance. Without regular in-field assistance, many APASPE members failed to implement the project on their farms at the beginning of the planting season. Many people then grew frustrated and began to lose confidence in APASPE.

APASPE's board members quickly recognized this problem and asked ELTI to provide more frequent technical assistance. Due to the lack of local expertise with silvopastoral systems and the high costs of bringing CIPAV experts from Colombia on a regular basis, ELTI turned to the U.S. Peace Corps Response Program in Panama for assistance. The



assigned volunteer, who had experience working on agroforestry in rural communities, was able to quickly develop trusting relationships with APASPE members. Once credibility was established, the volunteer helped to build capacity, provided prompt troubleshooting assistance, coached board members in information technology, and helped to develop a communications strategy to share their results with other community members. Sharing project progress proved to be an effective way to neutralize gossip about project failures and helped to promote APASPE in the community. The assistance of a technically competent

individual, who was able to earn the trust of the community, was instrumental in improving the confidence and capacity of the APASPE board and members. It empowered them and got their project back on track.

Longer-term successes

APASPE members were then better able to see their project through. By the end of the grant period, they had established the first two model farms, with combinations of intensive silvopastoral systems (up to 10,000 trees/shrubs per ha); low-density timber trees in small pastures with short grazing and long recovery times (Murgueitio et al. 2011), and mixed forage banks and reforested riparian areas. APASPE members also protected riparian areas and planted more than 8,000 trees of 25 different native species. Soon after implementation, the model farms began to show higher levels of milk production, with a 50% increase in overall forage biomass thanks to the trees and shrubs. This higher production persisted even throughout the dry season, when pastures dried out.

With these successes, APASPE quickly gained recognition for its alternative ranching methods. Awareness-raising strategies included communicating results via public outreach events, social media

(Facebook and a blog), and hosting interested farmers and professionals. Interest in their work was also reflected in an increase in APASPE's membership, from 15 to 28 active members. Other landholders also began to carry out some of APASPE's activities on their own farms.



The donor was impressed with the success of the first one-year grant, and invited APASPE to apply for a larger two-year grant to scale up silvopastoral systems and riparian area restoration. With support from ELTI and CATIE, the second grant from GEF (2013–2015), for US\$134,000, also included \$257,000 in matching in-kind funds from other collaborating organizations and institutions.

APASPE members then expanded to 11 model farms, where they demonstrated a range of sustainable ranching systems and forest restoration practices. This includes almost 40 ha of low- and high-intensity silvopastoral areas. ELTI and CIPAV continue to provide assistance and facilitate workshops on silvopastoralism, forest restoration management, and monitoring and evaluation.

After only four years of experimenting with silvopastoral systems, APASPE is widely recognized throughout Panama. Since 2012, the group has hosted more than 700 visitors and trained hundreds of national and international professionals and other farmers through ELTI's field-based and on-line forest restoration training courses. APASPE members also serve as co-facilitators during the courses, sharing lessons on their technical experiences and candidly discussing successes and failures in implementing a project as a newly formed group. In addition, APASPE has directly mentored other ranchers in forming their own producer organizations and preparing project grants.

Long-term challenges

APASPE's successes have not occurred without setbacks. The most basic, but most ingrained challenge was the deeply held cultural belief that cattle and trees do not mix. The conventional cattle pastures that have dominated the region for the past 100 years are mostly devoid of trees. Spanish colonizers cut down forests and fenced pastures with



barbed wire; this was the way that homesteaders claimed land (Connelly and Shapiro 2006). This preference for “clean” pastures is rooted in cultural beliefs, and in the assumption that trees shade out pasture grasses and harbour predators (Heckadon-Moreno 1984 and 2009). For traditional ranchers, pastures with trees are aesthetically displeasing, the sign of a “lazy-man’s ranch” or a “widow’s farm.”

Historically, national and international banks have funded the expansion of Panama’s agricultural frontier by loaning to farmers who transformed unsettled forests into pasture land (Heckadon-Moreno 1984 and 2009; Mozejko 2009). This meant that APASPE members had to not only defy a traditional style of ranching, but had to do so in a context where financial institutions, agricultural authorities and universities lacked any knowledge of agroforestry.

Also, as APASPE members found out for themselves, inspiring changes at the landscape scale remains elusive due to financial constraints. This is the case even if model farms can demonstrate benefits in terms of productivity and ecosystem services. Sustainable ranching systems are intensive by nature, requiring initial investments of US\$500–1,000 per ha to cover high labour costs. Although farmers who join APASPE are provided with materials and inputs, they still have to provide or pay for the labour needed to establish and manage the system. As a result of rapid economic development in Panama’s urban centres and Azuero’s own thriving tourism industry, the national demand for labour has increased. Youth are migrating out of the region or choosing to work in construction, which pays higher wages than farming. This has created a severe shortage of agricultural labour in the region and a corresponding 50% increase in labour costs in the past five years.

To overcome this, APASPE members relied on one of their main assets: being an organized group. They realized that they and their families could provide the necessary labour, and so decided to revive the “juntas,” a traditional system of community work for harvesting corn or rice, or for the construction of adobe homes. During juntas, landholders provide food and drink in exchange for labour. Work parties commonly include more than 100 people, and are extremely efficient in the hilly landscapes of the region where mechanization is not possible. APASPE organized the members in juntas that prepared land and planted trees; individual farmers could then take over the maintenance work.

Continuing challenges

Although the use of the junta tradition in agroforestry has helped to alleviate some financial burdens, APASPE members face challenges that may be more difficult to overcome. Interest in maintaining agrarian livelihoods in the region is waning, especially among youth, who prefer to work in other sectors. Today, most APASPE members are older men.

Despite the proven potential of silvopastoral systems and forest restoration to increase on-farm productivity and improve rural employment opportunities, distant markets and other socio-economic factors are important barriers to the long-term adoption of these more sustainable systems.

Conclusions

These were the key findings:

- In the absence of incentives for small producers, the development of local grass-roots environmental leaders and organizations, such as forest and farm producer organizations, can help to generate local interest and enthusiasm for sustainable land and natural resource management.
- During the initial stages, producer organizations require frequent support to facilitate ongoing capacity and leadership development in order to guarantee long-term success.
- Facilitating formal and informal capacity-building opportunities for farmer-to-farmer learning allows producer organizations to share experiences with others, and to clearly communicate the effort and investment needed.

APASPE provides a clear example of how a producer organization can effectively tackle the challenge of improving the sustainability of farming systems and restoring local ecosystems in order to improve the quality of life. Through their struggles, members have learned to overcome many obstacles, and have emerged as insightful examples in the region for other forest restoration practitioners. In particular, they have inspired cattle ranchers and community leaders who are interested in forming producer organizations to implement sustainable agricultural systems. APASPE's experience illustrates the necessity of providing long-term support and assistance through project funding and development strategies. It also demonstrates that broader larger socio-economic and cultural contexts may hinder the long-term success of any such initiatives.

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