

Family coffee farmers improve mountain soils

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Abstract

Located in the highlands of the Panamanian Central Cordillera in the Santa Fe district of Veraguas province, the 72 636 ha Santa Fe National Park has proven critical for conveying the need for investment in the conservation and sustainable management of natural resources. It belongs to the Mesoamerican Biological Corridor, a highly biodiverse region that encompasses seven Central American countries and Mexico. In addition, it contains a strategic water reservoir for the major human settlements of the country, and the water streaming from its watershed and the related rivers has great potential to generate hydropower. Thanks to the elevation and steepness that characterize the geomorphology of the park, all the springs of the major rivers originating within the protected area may potentially generate renewable energy.

The non-governmental organization (NGO) Fundación CoMunidad works with family farmers engaged in small-scale coffee production in the protected area and its surroundings. A buffer zone outside the natural park is a forested area with trees such as *Cedrela odorata* and *Cordia alliodora* up to 30 m high and an understorey with many fallen leaves. Hence, this area is a productive system with natural or significant spontaneous woody vegetation. These lands are suitable for the production of coffee, and their humid tropical climate also allows for the production of complementary crops such as citrus, beans and vegetables. With constant rain throughout the year and favourable soil features, the area also has good agricultural potential for various forest and fruit plantations.

Keywords: Family Farmers, Coffee, Ecosystem Services, Climate Change, Latin America and the Caribbean, Resilient.

Introduction, scope and main objectives

The production of shade-grown coffee is key to the conservation of mountain ecosystems. In Panama's Santa Fe National Park, coffee is a traditional crop and one of the main income sources for many family farmers who live in the protected park area and its surroundings. The cultivation of shade-grown coffee ensures environmental, polyculture and agroforest biodiversity, contributes to soil conservation and plays a crucial role in mitigating and adapting to climate change.

The park has mountain ranges with narrow valleys and elevations ranging from 600 to 1 400 masl. Mountains slopes are steep, especially in the southern section of the Santa Fe National Park and its buffer zone, and soils are thin with good internal drainage. The predominant soils of this mountain region have a pH that tends to range from acidic (< 6.5) to very acidic (4.5). This is because the rainfall has historically induced a strong phenomenon of nutrient leaching and soils are exposed to wind erosion and other atmospheric agents.

Methodology

The work of family farmers engaged in shade-grown coffee generates multiple benefits due to the use of native species, soil conservation and improvement practices, reduced dependence on petrol and derivatives

through agro-ecology, practice of polyculture and silvopastoralism, terraced coffee plantations and crop rotation. One of the salient features of the traditional farming systems is their high degree of biodiversity thanks to polyculture and agroforestry. Diversified systems support several ecosystem services such as soil carbon sequestration, regulation of the hydrological cycle, provision of habitat for natural pollinators and control of pests and diseases through natural enemies. All this, in turn, promotes dietary diversity and improves the long-term productivity of soils, even with low levels of technology and limited resources.

Results

The techniques the family farmers have implemented for shade-grown coffee have reduced soil erosion and nutrient loss, while also respecting the ground cover, the trees and their extensive root systems which are key elements for agriculture to conserve and improve soils in mountain.



Photo 1: [Coffee / Alberto Pascual Q]

Photo 2: [Family Farmer / Alberto Pascual Q]

Discussion

All components and joint actions of this project are framed and legitimized within the Management Plan of the Santa Fe National Park published in September 2014 by the Panamanian Ministry of the Environment which calls for: • reducing the pressure on natural resources by promoting sustainable production techniques, restoring degraded areas, strengthening local capacities, income generation and use of native species, identifying crops that are suitable to the park's soil and overall improvement of livelihoods; • promoting understanding and analysis of the human-environment interaction in the park and its buffer zone, with special emphasis on indigenous communities; • promoting knowledge sharing on the biophysical, ecological and cultural features of the region; • ensuring participative management of the park involving local communities, institutions, NGOs

Conclusions

In this framework, Fundación CoMunidad works with local producers to establish shade-grown coffee as a finished brand product. This has potential to open new markets, build public and private partnerships, and identify new strategic partners, always ensuring sustainable use of natural resources and soils conservation and improvement within the Santa Fe National Park and its buffer zone.