

Nature-based solutions: Experiences and opportunities in agricultural landscapes in Latin America and the Caribbean

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Nature-based Solutions (NbS) are actions to manage ecosystems or to emulate natural processes, in order to address sustainability challenges in a cost-effective manner.



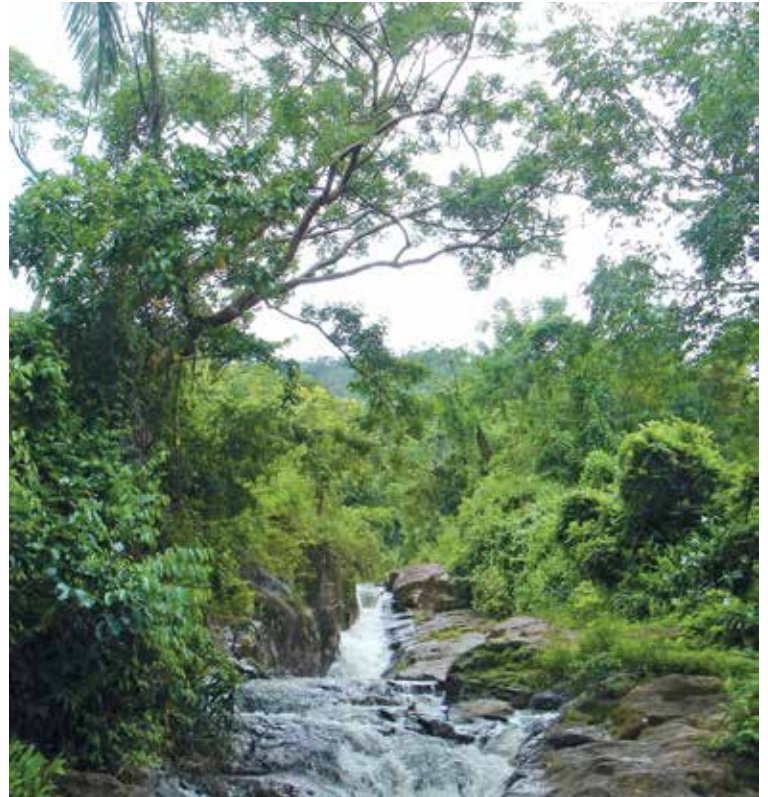
NbS are gaining traction due to their integrated approach and broad scope, which provide cost-effective alternatives for natural resource management and response to climate variability and change. Some 130 countries have incorporated ecosystem management into their nationally determined contributions, to tackle climate change. In the rural landscapes and ecosystems of Latin America and the Caribbean (LAC), nature-based approaches are not new, but are becoming increasingly relevant in light of the need to produce more, even in the context of decreasing biodiversity and climate change.

IICA is the specialized agency for agriculture of the Inter-American system, with a mission to encourage, promote and support its 34 Member States in their efforts to achieve agricultural development and rural well-being through international technical cooperation of excellence.

CATIE is an international organization, with a mission to achieve the sustainable and inclusive well-being of people in Latin America and the Caribbean, promoting education, research and outreach for the sustainable management of agriculture and conservation of natural resources.

Remediation and recovery of degraded soils in the Caribbean (Antigua and Barbuda, Guyana, Haiti, Jamaica and Surinam)

Soils constitute the second largest natural deposit or source of carbon on the planet. In addition to improving the productivity and health of soils, restoration has immense potential to mitigate climate change. IICA spearheaded a regional initiative that applied science-based in-field solutions, through the development of a four-step process for sustainable soil management: i) knowledge management, ii) technical capacity building, iii) in-field demonstrations, and iv) development of a portfolio of national and regional projects and the identification of funding opportunities. Methods for the recovery and remediation of soils contaminated by mining activities or excessive use of fertilizer were systematized, based on the introduction of organic material as a natural solution. During the three-year implementation period, the project established standardized monitoring protocols, promoted the exchange of good practices and lessons learned, and spearheaded coordination efforts between different actors and levels of government (central and municipal government) and production sectors. Close to 300 persons participated, including farmers and representatives from ministries of agriculture, universities, research centers and laboratories, private sector and community councils. The project generated a portfolio of 16 projects and an IICA cooperation strategy for the Caribbean.



Watershed management improvement programs in Jamaica

Currently, CATIE, in collaboration with various Jamaican government organizations is designing a monetary incentive program to encourage small farmers to implement solutions to increase soil and water retention on their farms. This includes the use of natural barriers, agroforestry systems, protection of forested areas and other actions aimed at increasing and protecting soil coverage. These investments will increase farm productivity, and consequently, the well-being of the families of participating farmers. Other users in the watershed will also reap significant co-benefits, particularly the company that supplies water to households and industries in Kingston and other surrounding cities. In turn, this will boost this area's resilience capacity in response to extreme climate events.

○ Climate-smart dairy farming

CATIE's livestock farm in Costa Rica is innovating in the area of animal genetic improvement, by developing breeds that are reproductively more efficient, less dependent on grains, and have a greater local forage utilization efficiency, and consequently a lower carbon footprint. Pasture rotation and a silvopastoral system, which includes the cultivation of nitrogen-fixing species, produces forage and reduces the use of agrochemicals. Moreover, trees enhance the environmental conditions for the cattle, whereas, proper water resource management has resulted in a 60% decrease in expenditure for this service. In addition to the improved processes, the operation utilizes rainwater harvested on the roofs of the dairy facility (30,000 liters), which provides a supply for eight working days. This natural resource economics uses animal waste to fertilize the soil and to produce biogas for electricity generation. All of these nature-based measures, designed and implemented in an integrated manner, have proven to be cost-effective, as part of a process of continuous improvement, aimed at enhancing climate change resilience and adaptation.



○ Agro-ecosystemic adaptation in Central American coffee production

In Central America, the impact of climate change on coffee production is already evident. Since 2016, the European Union and IICA, with partners such as CATIE, CIRAD y CAC, have been undertaking an adaptation project in seven countries, based on a multi-strata agroforestry system (Central American Program for Integrated Coffee Rust Management - PROCAGICA). Production management includes the development of climate-based epidemiological forecasting models, the use of coffee leaf rust-resistant varieties, and the introduction of layers of associated crops with perennial and semi-perennial species. This inter-cropping system satisfies various objectives, as it: a) includes fruit trees (banana and citrus) that provide shade for the coffee plants, thereby increasing their heat tolerance; b) increases food security and diversifies the income sources of producers; and c) creates a habitat for natural pollinators and biological control agents, given that it is a more biologically diverse system. These combined measures based on the dynamics of the ecosystem, reduce the incidence of pests and boost climate change resilience and adaptation.

Definitions

The International Union for the Conservation of Nature (IUCN) defines NbS as: "actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits". (Cohen-Shacham, E; Walter, G; Janzen, C; Maginnis, S. 2016. Nature-based solutions to address global societal challenges. Gland, Switzerland, IUCN).

Another widely used definition from the European Commission defines them as "solutions inspired and supported by nature, designed to address societal challenges which are cost-effective, simultaneously provide environmental, social and economic benefits, and help build resilience". European Commission. 2015. Nature-based solutions. Brussels, Belgium.)



The strengths of IICA and CATIE

The examples discussed demonstrate the experience of IICA and CATIE in the design, implementation and contribution to public policy, geared toward NbS. Both organizations are committed to increasing the application of these types of solutions in the rural landscapes of LAC. Moreover, they have the capacity to bridge the knowledge gaps in the application of nature-based solutions and their economic, environmental and social benefits, by leading a public policy and research agenda in this area.

A roadmap for LAC

IICA and CATIE have undertaken the task of compiling case studies on NbS and economic assessment methods. Both institutions will continue to pursue these efforts to define various types of policy incentives and to include them in agricultural business models. From an institutional perspective, CATIE and IICA will promote the establishment of inter-sectoral arrangements that support policy standardization for the scaling-up of NbS, as well as the enactment of regulations and introduction of incentives to increase their appeal vis-a-vis other alternatives. Similarly, we propose that discussion forums should be established among various actors, to define priorities in respect of environmental problems in different geographic environments, as well as their respective solutions.



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