

Case Study Description: Costa Rica

The following is a short description of policy and research questions in the Costa Rican case study of POLICYMIX. This page will be continually updated as the case study focus is developed. Assessments of economic instruments in their policymix in case studies will take place in 2011-2013. Contact: **Fabrice DeClerck, CATIE**

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1. Introduction

The Mesoamerican Biological Corridor (text modified from B. Finegan in DeClerck et al. 2010)

Around 10.7% of Mesoamerica is currently under some category of protection for biodiversity conservation, ranging from <1% in El Salvador to 25% in Costa Rica (Miller et al., 2001). Protected areas are regionally integrated, at least on paper, into a single functional conservation area (Poiani et al., 2000), the Mesoamerican Biological Corridor (MBC). The program seeks to apply the Convention on Biological Diversity's ecosystem approach to support conservation initiatives that are strongly linked to sustainable rural livelihoods. Among the MBC's most significant achievements is the alignment of local priorities, social capital, and political will to carry out grassroots initiatives with both conservation and development objectives (Proyecto Corredor Biológico Mesoamericano, 2007). The MBC concept thus includes a strong focus on local drivers of conservation, recognizing that conservation must be considered a social process that addresses contested resources and controversial issues. Maps of the MBC (**Figure 1**) emphasize the substantial regional presence of protected areas, although recently compiled GAP analyses suggest that these do not ensure adequate representation of the region's biodiversity (e.g. SINAC, 2007), and the lack of effective management of many or most of these areas is almost axiomatic (Hockings et al., 2000).

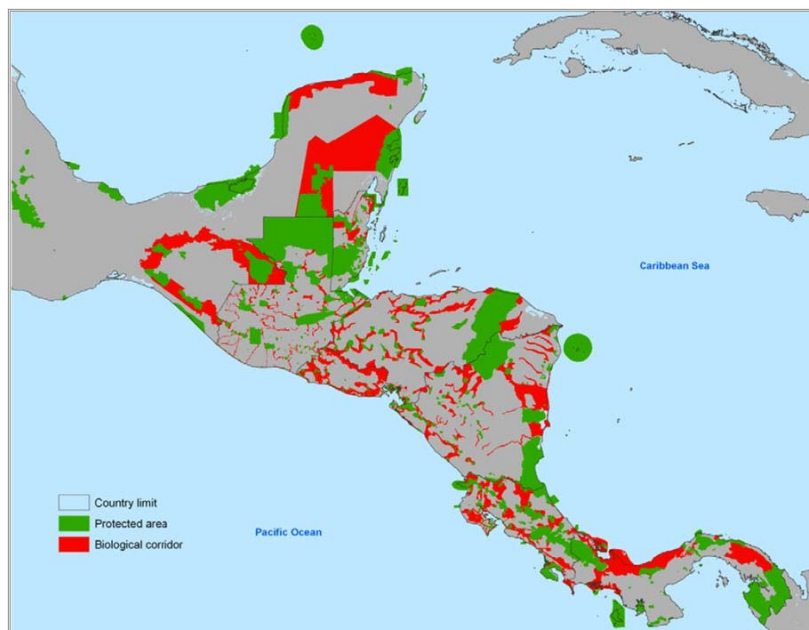


Figure 1: "The Mesoamerican Biological Corridor".

Examples from experiences in Costa Rica illustrate these points, but also serve to indicate ways in which effective participatory management of biological corridors can be achieved in Mesoamerica. Since the initiation of the MBC, the government of Costa Rica has officially recognized biological corridors and adopted them as one of its principal conservation strategies, although these areas are not legally defined as conservation areas. Rather, corridors owe their existence to grassroots initiatives that are coordinated by the country's national Biological Corridors Program, a dependency of the National System of Protected Areas SINAC. Corridor management is coordinated by local councils, which bring together a broad range of governmental and non-governmental organizations. To date, 47 biological corridors have been proposed in Costa Rica, covering some 1 753 822 ha, representing 35% of the country's land area, and potentially uniting the 160 protected areas. Of these 47 proposed corridors, 24 have active and functioning local councils.

2. National Level Case Study

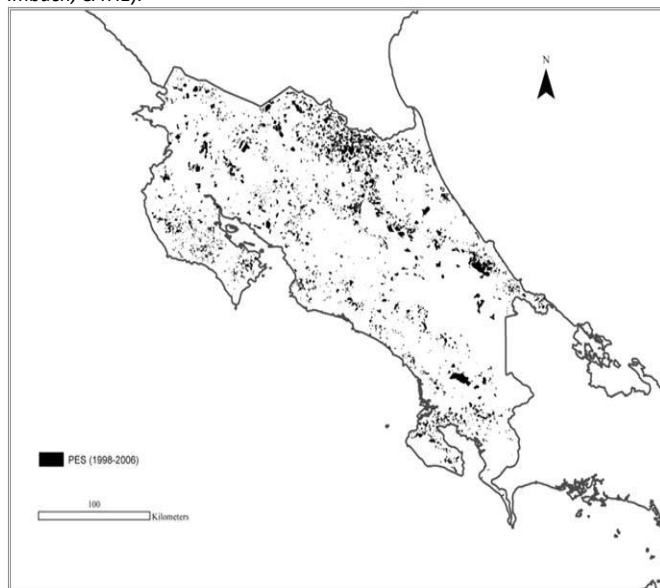
2.1 Main economic instruments in use in forest/biodiversity conservation and related regulatory instruments

The core idea of Payments for Environmental Services (PES) is that external ecosystem service beneficiaries make direct, contractual and conditional payments to local landholders and users in return for adopting practices that secure ecosystem conservation and restoration.

Costa Rica has one of the longest running national PES schemes in the world (**Figure 2**).

Introduced by Law in 1996, it recognizes the economic value of forest environmental services, and sets the system to pay landowners. By 2008 the managing institution – the National Forestry Financing Fund (FONAFIFO), had allocated over 10,000 contracts and US\$206 million, an average of US\$17.2 million per year into different PES modalities. Current distribution of contract types is protection (63%); reforestation (21%), forest management (4%) and agroforestry (12%), with increasing allocation to reforestation and agroforestry in recent years.

Figure 2. Location of PES recipients in Costa Rica (1998-2008) (Source: Pablo Imbach, CATIE).



2.2 New instruments under consideration or to be assessed

From focusing on individual ecosystem services, the PES research agenda has moved towards assessments of policies to provide multiple 'bundled' ecosystem services in land-use, distributional issues, uncertainty, social embeddedness and power relations. Recent impact evaluation studies in Costa Rica report little significant effectiveness of PES on deforestation, and only small positive results for forest re-growth. PES impact evaluation studies in Costa Rica have recently been criticized for inadequate consideration of limitations in the spatial data, sampling biases and confounding between effects of PES and prior forest policies.

However, locally controlled biological corridors have increasingly been responsible for significant advances in conservation throughout the nation. These corridors are recognized at the national level, but are managed at the local level by multiple stakeholders, including representatives of national, regional and local institutions. PES serves as one means through which land is placed under conservation although this mechanism primarily targets individual landowners, and the available funding is far below the current (and growing demand). The locally managed biological corridor steering committees permit residents to the landscape to identify critical ecosystem services of interest to the community, to prioritize them, and to identify which portions of the landscape are most suited for providing those services – the notion of targeting and bundling mentioned above.

Of increasing interest, and importance is Costa Rica’s “Peace with Nature” initiative (<http://www.peacewithnature.org/>) which sets much of the national agenda, and which take a functional approach to biodiversity conservation. This presidential initiative was started by Nobel Peace Prize winner and former Costa Rican President Oscar Arias and was officially launched on July 6, 2007. The proposal includes an internal agenda for Costa Rica that aims to achieve environmental sustainability for the maintenance and restoration of the ecosystems and ecosystem services. The primary (and bold) ambitions of this program are: (1) to make Costa Rica carbon neutral by 2011, (2) to create and implement environmental management plants in all governmental entities, (3) to continue to increase forest cover in Costa Rica and strengthen the system of protected areas, (4) to incorporate environmental education for sustainable development in the Public Education curricula. According the initiative web site, the Initiative was initially created through executive Decree No. 33487-MP December 29, 2006. This Decree makes the Initiative of Public Interest, and all Ministries and decentralized public institutions are required to affiliate with the Initiative through concrete action. A Presidential Committee of 25 members and a high-level Executive Committee were also established. The Peace with Nature Initiative is led by an Executive Office, whose offices are located in the Ministry of the Presidency. The combination of increasing national incentives for conservation with growing participation in local participatory planning institutions provides a unique opportunity to study multi-scale interactions and incentives for conservation.

3. Local Case Study: The Chorotega Biological Corridor

The Chorotega Biological Corridor (CBC) one of the regional biological corridors that comprises the greater MBC. The CBC is situated in northwest Costa Rica in the Nicoya Peninsula in land that was originally covered by semi-deciduous tropical forest (**Figure 3**).

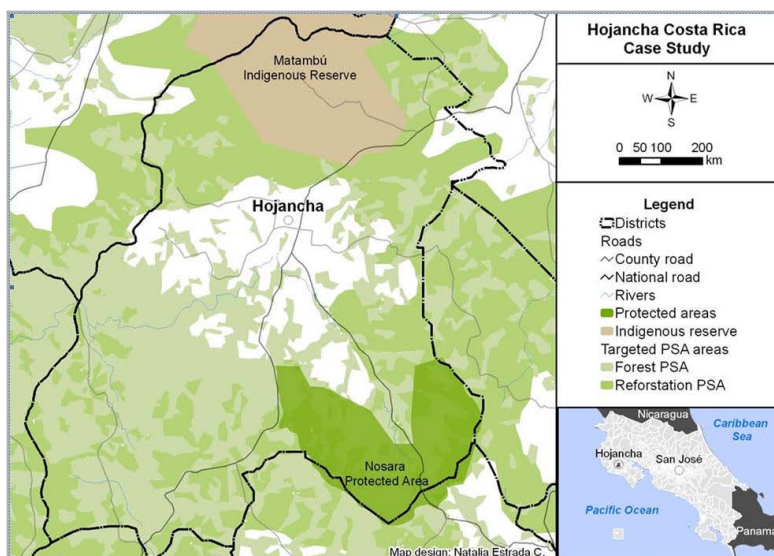


Figure 3: "The Chorotega Biological Corridor, one of the regional corridors which comprises the greater Mesoamerican Biological Corridor."

The dry and moist forests of the Chorotega region (**Photo 1**) are amongst the most threatened in Mesoamerica as well as being amongst the least studied. The biodiversity of the extensive pastures that have replaced these forests have significantly lower species richness of birds and butterflies than in adjacent silvopastoral and forest systems (Saenz et al 2007). The corridor, which encompasses 153,000 ha, connects the Barra Honda National Park and the Tempisque Conservation Area.



Photo (1) by: Nilsa Bosque-Perez

Key districts located in the CBC include Hojancha, Monte Romo, Puerto Carrillo and Huacas. In addition the CBC includes the Matambú Indigenous Reserve of Guanacaste (800 ha) comprised of 1100 indigenous habitants. Geographically, the CBC is located in the North Pacific of the province of Guanacaste and features an elevational range from sea level (Puerto Carrillo) to 900 m.a.s.l (Altos del Socorro). The total population is relatively low with 6776 habitants and a population density of 25 habitants/km². Poverty persists outside the agriculture/forestry sector among the urban poor and landless. Unemployment rates show that the area is still vulnerable to poverty.

The region enjoys a long rainy season between May and December, but is affected by a significant dry season between the months of January and April when water can become scarce. During this dry season, agricultural productivity low, particularly in pasture systems when forage becomes scarce. The region includes portions of the Pacific coast of the Nicoya Peninsula whose beaches are renowned and increasingly being developed for vacation homes and hotels, predominantly by foreign investors from the US and Europe.

3.1 A brief history of deforestation and recovery

From about 1910 the area was colonized by subsistence farmers as well as commercial farms producing coffee, grain and livestock. Livestock farming gradually became the main production activity over time. As a result, forest cover decreased to below 20% by the 1960s. At this time, the

local population reached its peak with 30 inhabitants per km². Following Hojanca's colonization, a large percentage of virgin forest was converted to subsistence agriculture (maize and beans) and subsequently to pasture. By 1970 more than 75% of the area had been deforested with significant environmental degradation due to the adoption of inappropriate agricultural practices. The cattle production models adopted were based on the use of grass monocultures that degrade in time, which in combination with overgrazing and the use of fire as a management tool led to significant erosion, sedimentation of rivers, reduced water flows and loss of biodiversity.

The decrease in the international price of meat in the 1970's combined with the elimination of government supported loan programs for cattle grazing caused a decline in the growth rate of the cattle industry in the Chorotega region. These social drivers, combined with several strong El Niño's drought years in the Chorotega region drove the en mass abandonment of unsustainable cattle production systems in the region accompanied by a large outward migration where the population decreased by more than half in a few years.

Due to the sudden emigration and pasture abandonment, significant forest regrowth was seen throughout the area. Forest recovery was speeded up by several forestry incentives from the government introduced in 1969 and large foreign investments, and teak plantations were established in Hojanca. In 1991 the government introduced payments for environmental services to encourage reforestation. By 2005 forest covered 55% of the land surface (Vallejo et al., 2006) although much of this land surface is in teak and melina plantations whose contribution to biodiversity conservation and ecosystem services is subject to debate. Since 1980, local and national policymakers have implemented policies that promote restoration of biodiversity and ecosystem functions in degraded lands through the promotion of sustainable agricultural practices such as silvopastoral systems and organic coffee production. This restoration of biodiversity, has also been linked with a restoration of ecosystem function. NEAA (2009) calculated that the Mean Species Abundance, an indicator of the intactness of ecological communities, increased from 22% in 1970 to 56% in 2005 within the CBC. This change has been brought about by increasing public awareness of the ecological impacts of the expansion of cattle ranching in Costa Rica and novel institutional and policy reforms aimed at transforming the national economy from agrarian to industrial (Sánchez-Azofeifa, 2000) with unintended, but positive, conservation implications.

The area of primary forest in the CBC has decreased from about 18% to 12%, but was compensated by expanding forest cover. Between 1970 and 2000, the area classified as pasture in the area reduced from 60% to 20%. Croplands, the second dominant landuse also decreased from 22% to 10% in the same time period. This decrease in agricultural landuses was met with a concomitant increase in the area under secondary forests and plantation forest whose coverage increased from nil to over 40%. The area classified as forest plantations also increased from 0% to 20%. Forest activities accounted for 30% of total income in 2002, at the same time tourism became an important economic activity in the region. Incomes from forestry incentives and payments for environmental services were substantial. The share of timber production (harvest) from plantations increased from 5% in 1995 to 45% in 2002.

Primary instruments used to promote conservation in the region come from the Ministry of Natural Resources and the launching of new forestry laws and policies in addition to the protection of more than 450000 ha in private lands with economic incentives (i.e. tax deductions, reforestation loans and payments for environmental services) and the reduction of deforestation and forest fires (Calvo, 1990, 2000). Possibly the most recognized internationally was the modification of forestry laws that included the payment for environmental services (PES) and thereby creating FONAFIFO, the organization mandated managing this PES scheme. Currently, there are more than 596 ha in Hojanca that are receiving PES for reforestation, and 1386 ha receiving payment for protection including farms implementing silvopastoral systems.

Apart from PES, one of the most interesting municipal forest management and reforestation projects originated as an initiative to protect the upper part of the Nosara River watershed in the north Pacific driven by the establishment of the Chorotega Biological Corridor which actively purchased upland terrains for reforestation and water conservation. To date, 60% of the area has been recovered through land purchase, reforestation projects and negotiation of PES to other owners in the region. Other economic incentive systems are currently being developed including the certification of forest products and payment for hydrological services.

The implementation of the PES program reflects the recognition by the Costa Rican government that forests generate services that benefit society and that the generation of these benefits should be compensated. Given that the Costa Rican government has implemented this novel conservation instrument country-wide, including Hojancha, our goal is to evaluate the effects of this policy on economic and environmental outcomes. From an economic perspective, we will evaluate the program's effects on employment, economic activity, and income in the area; the later as a proxy for impacts in poverty reduction. Environmental outcomes are to be evaluated in terms of impact on deforestation rates and adoption of better agricultural management practices such as silvopastoral systems. We will compare the outcomes of the PES scheme with the results of other instruments such as protected zones in the same area.

4. Main ecosystem services under evaluation:

- Biodiversity with a focus on biological connectivity (primary, independent of role for ecosystem services)
- Hydrological Services, specifically resistance to drought through regulated water flows and increasing water capture. In many ways, activities targeting these hydrological services drive the biodiversity conservation.
- Agro-ecological services such as pollination and pest control services (primarily considered by IGERT students working in the region).
- Recreation and ecotourism particularly scenic values (secondary)
- Socio-ecological Resilience



5. Main actors/stakeholders:

- Member of the Chorotega Biological Corridor Steering Committee
- Ministry of agriculture
- Ministry of environment
- Local municipalities
- Representatives of the Hojancha municipality
- Cattle, coffee and timber farmers of the region
- Foreign visitors and residents
- General public, researchers, environmental NGOs
- Agricultural Center for the province

6. Main economic instruments in use in forest/biodiversity and related regulatory instruments:

- Opportunity cost of timber, cattle and coffee production in the area
- National Payment for Ecosystem Service Program (FONAFIFO).
- Certification Schemes for Coffee (Organic and Rainforest Alliance) and timber-potential
- Land-use laws and practices, coordination between municipalities and county/national levels
- Changes in real estate values.

7. New instruments under consideration or to be assessed:

- Voluntary conservation schemes nearby
- New certification schemes for cattle production (Rainforest Alliance)
- Combination of more protection combined with local development opportunities in relation to protected area (recreational home construction, ecotourism and cultural heritage activities)
- REDD++ and other Biocarbon funds

8. Key Collaborations:

The PolicyMix team working on the Hojancha case study will be joined by up to 5 doctoral students from the CATIE/University of Idaho Joint Doctoral Program. This team of students will collaborate to study “socio-ecological resilience in changing landscape” with projects that will largely run parallel to PolicyMix work. The students are funded by a National Science Foundation grant on Integrated Graduate Research Education and Training (IGERT). For more information, visit the following website: <http://www.cals.uidaho.edu/igert2/>

Other key collaborations will be come from CATIE’s FINNFOR project and the stakeholders mentioned above (www.catie.ac.cr/FINNFOR).

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