Natural Capital Accounting and Policy
Costa Rica

WAVES
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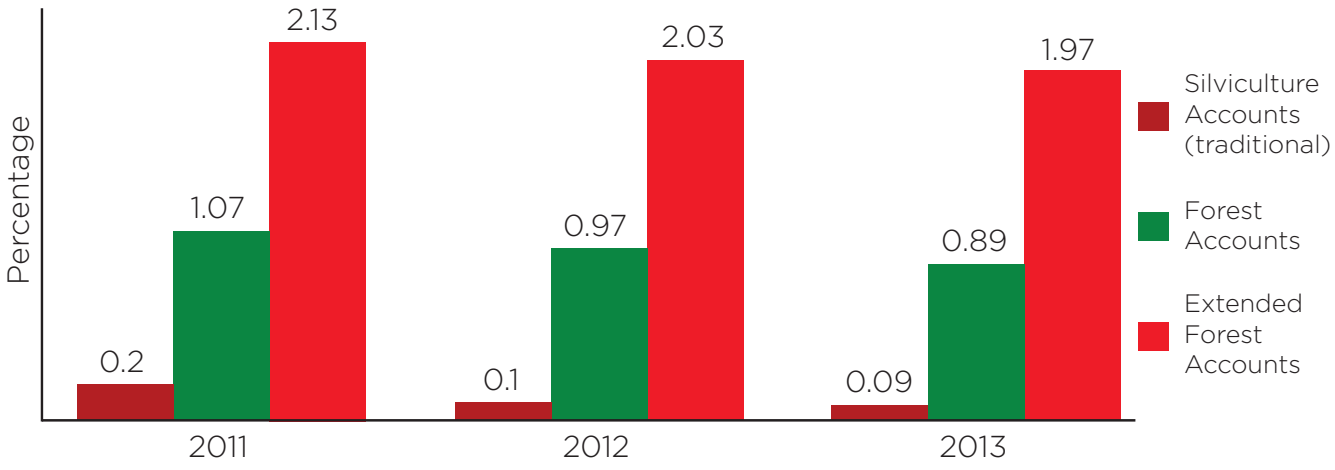
Why Is Natural Capital Important?

Costa Rica has made significant investments in conserving its abundant natural resources, with great success.

- More than half (52 percent) of the country is now covered with forests.
- More than 90 percent of electricity is generated by renewable sources. (For 150 days in 2016, the country used 100 percent renewable electricity.)
- Fourteen percent of the country's gross domestic product (GDP) comes from agriculture and agribusiness, a sector that employs 13 percent of the economically active population. Agriculture depends on and affects ecosystem processes such as water and greenhouse gas emissions. The country has signed up to pursue a new climate-smart agriculture agenda—through such efforts as the Nationally Appropriate Mitigation Action (NAMA) on coffee.

Costa Rica has prepared three main accounts—for forests, water, and energy—using the United Nations System of Environmental-Economic Accounting (SEEA). Results from the first set of accounts will start to reveal the value of natural capital's contributions to society. This data will help to define the country's policies into the future.

Figure 1. Participation of Forests in GDP



Source: Central Bank of Costa Rica. 2016. *Environmental Accounts of Costa Rica: first results.* Available at: www.bccr.fi.cr/cuentas_ambientales/documentos/Environmental_Accounts_Print.pdf.

Note: The contribution of forests to the economy traditionally focused on silviculture, with evidence of a declining contribution. Introducing natural capital accounting widens the focus beyond timber.

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What Do the Accounts Show?

Forest accounts show growth in forest cover. There was an increase of some 97,600 hectares in cover between 2011 and 2013, equivalent to 244 million tons of carbon stored in forests. This information has contributed to the government's strategy on reducing emissions from deforestation and forest degradation (REDD+), a key component of its National Plan for Forest Development 2011–20. The forest accounts have supported the design of Costa Rica's Payment for Environmental Services program.

They also reveal a truer value of the contribution of forests to the economy. This had been underestimated (Figure 1), effectively making the forest sector invisible to investments and as a source of real natural capital; with the forest accounts, these values are being revised upward. Additional information includes the contribution forests make to carbon sequestration and, when linked to their impact on regulating water flow, to hydroelectricity.

Water accounts provide quantitative and qualitative data by sector. The data can support cost-recovery models—not only showing who derives more benefits per cubic meter of water, but also monitoring inefficiencies in distribution (Table 1).

For example, accounts show high impact and efficiency from hydroelectricity: all water used (26 cubic kilometers per year) is returned to the system. More than two-thirds (71 percent) of electricity comes from hydropower; this is the main reason Costa Rica managed to generate 100 percent of its electricity from renewables for 150 days[1] during 2016. Water accounts—together with energy accounts—can inform the expansion plan for electricity generation prepared by the National Electricity Institute (ICE) for 2015–30.

The investments made in hydropower infrastructure also need to support water supply sources—promoting watershed conservation, for example—to make sure that these investments remain viable in the long term. Many catchment areas are already covered by forests, an investment that is paying off. But more attention and investments are needed in catchments nearer populated areas. It is also important to promote sustainable and resilient agriculture that does not compromise agricultural commodity supply chains.

There are high inefficiencies in domestic water provision and irrigation for agriculture. Accounts show a large discrepancy between water extracted by utilities and the average supply to households. Irrigation, meanwhile, uses about 1 cubic kilometer of water per year, half of which is not accounted for.

This information has important repercussions for infrastructure investments and potential cost-recovery strategies. For instance, the main irrigation canal (Arenal-Tempisque) brings water to dry areas of the country at a large cost; a new expansion is estimated at US$13 million. Recouping such investments requires not only better tariffs but attention to inefficiencies, as higher prices may only lead to more illegal extractions. Irrigation plays a big role in climate-smart agriculture in Costa Rica,[2] and the government is preparing a plan for this approach and looking at financing opportunities.

The domestic water sector is well served: 99 percent of Costa Ricans receive water from improved sources, and 100 percent have improved sanitation facilities. This is a great achievement, particularly in relation to Sustainable Development Goal 6. At the same time, accounts show that around 95 percent of wastewater is not collected in

sewers, and only 10 percent of the wastewater collected is treated. This means that most wastewater goes back untreated into rivers, lakes, or the sea.

Energy accounts provide evidence for choosing efficiency strategies that will have the largest impact on people, the economy, and the environment. The accounts—the first of their kind in Costa Rica—also help to identify and balance the trade-offs between different economic activities, and can be used to design and monitor national strategies for reducing greenhouse gas emissions. They quantify energy dependence by economic activity and source, and show impacts of energy use across the economy. The information feeds into the National Development Plan 2015–18 and helps shape investments in technology.

One major finding of the accounts: the relatively large energy footprint of sugar manufacturing. This economic activity is more energy-intensive than most others in Costa Rica—a function in part of the low gross value added and the use of bagasse as an energy source—and is a major source of carbon dioxide emissions (Figure 2).

Creating the accounts helped institutionalize the approach and the availability of data. The data have been well disseminated and are available as Excel files on the Central Bank website. The process of preparing the accounts was fully integrated into the Central Bank national accounting process. Background studies made sure the information was developed with a clear understanding of the components that link resources to users: institutions, legislation, and policies. The Ministry of Environment is moving on to advocacy to encourage the use of the accounts.

Table 1. Some Economic Indicators	
Water billed per inhabitant	155 liters/day
Average tariff (US$/cubic meters)	1
Unbilled water (inefficiencies)	54%
Gross added value/production	68%
Intermediate consumption in electricity production	24%
Clients attended	100%
Total water extracted	2.377 cubic kilometers (km^3)
Extractions as proportion of total water resources	2%
Water losses by water utilities	57%
Water losses in irrigation	51%
Wastewater collected in sewers and treated	10%
Population using improved sanitation facilities	100%

Source: Central Bank of Costa Rica. 2016. Environmental Accounts of Costa Rica: first results. Available at: www.bccr.fi.cr/cuentas_ambientales/documentos/Environmental_Accounts_Print.pdf.

Figure 2. Energy and Emissions Intensity

(energy in gigajoules and emissions in tons of CO_2 per million colones, the Costa Rican currency)

	2011	2012	2013
Support activities for agriculture and livestock	11 0.8	26 1.8	25 1.8
Manufacturing of sugar	156 16.2	148 15.7	144 15.2
Supply of electricity, gas, steam, and air conditioning	19 1.8	10 1.1	22 2.3
Ground transportation, except taxis	30 2.2	27 2.0	26 1.9
Taxi transportation	17 1.2	27 2.0	26 1.9
Marine, air, and terrestrial freight transportation	30 2.2	22 1.6	22 1.5

= Energy
= Emissions

Sources:
Central Bank of Costa Rica. 2017. *Primeros resultados de las Cuentas Ambientales de Costa Rica*. Available at: site.crn.go.cr/Desgargas/foro_2017/Sesion-I-Henry-Vargas.pdf.

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Notes

[1] Presidency of the Republic of Costa Rica. *Costa Rica llega a 150 días con electricidad 100% renovable en 2016.* Available at: presidencia.go.cr/comunicados/2016/09/costa-rica-llega-a-150-dias-con-electricidad-100-renovable-en-2016/ (accessed May 29, 2017).

[2] World Bank, CIAT, CATIE. 2014. *Climate-Smart Agriculture in Costa Rica.* CSA Country Profiles for Latin America Series. World Bank: Washington, DC.

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WAVES is a World Bank-led global partnership that aims to promote sustainable development by ensuring that natural resources are mainstreamed in development planning and national economic accounts.

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