

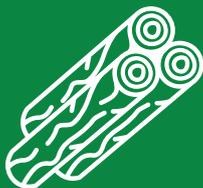
Natural Capital Accounting: Making Forests Count

Forest accounts can help shape good policy on matters ranging from timber extraction to reduction of greenhouse gases. In Colombia, forest accounts have even helped to quantify the environmental impact of the country's long conflict and estimate the environmental dividends of peace.

When forest accounts are linked to other natural capital accounts—such as those covering land, water, or energy—they can yield even more detailed data of value to policy makers. For example, understanding the impact of deforestation on an ecosystem's ability to buffer flooding threats can contribute to better land-use planning.

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The business value
of **WOOD**



US\$0.4 trillion

Global value of the
timber industry

The value
of **TREES**



US\$3.7 trillion

Value of conserving forests
just to cut greenhouse gas emissions

Sources: United Nations Environment Programme (UNEP) and World Bank, 2012.

Card 1 A Landscape View of Forests in Southern Palawan, the Philippines

What Do the Accounts Show?

Forest land dominates the Southern Palawan landscape, but it is rapidly changing. In 2003, all types of forests—including forests with closed canopies, open forests such as wooded grasslands, and mangrove forests—covered 82 percent of the land; by 2014, that figure had dropped to 70 percent.

Changes in the composition and types of forests affect biodiversity, carbon sequestration, and ability to regulate water flow. Cities and agriculture are increasing significantly, changing the landscape, increasing waste and pollution, and placing greater demands on resources such as water and energy.

Why Is This Important?

Information from forest and land accounts—such as the data seen below—can be used to support detailed land planning. For example, it can pinpoint geographical areas where rapid urbanization is leading to a loss of vegetation and increasing flood risks. The accounts help identify what factors are driving changes and what impacts these may have on forests in the future.

Because the data follow the format of the United Nations System of Environmental-Economic Accounting (SEEA), they can be linked to other statistics, such as gross domestic product (GDP).

Land Cover Changes in Southern Palawan, the Philippines (2003-14)



74% of closed forests lost, equivalent to 100,000 hectares (ha)

Total forest cover (including open forests and mangroves) declined from 82% to 70%.



10x increase in built-up areas, from 700 ha to 7,500 ha

New settlements placed added demand on resources (such as water and energy) and increased pollution.



30% of land now under crops, an increase of 67,000 ha

Perennial crops (mainly coconut and oil palm) increased by 151%, but annual crops remained steady.

Card 2 Forests and their Contribution to Colombia's Economy

What Do the Accounts Show?

Forest accounts pull together large amounts of physical and monetary information to depict the state of forests within a country (stock and flows). This includes quantitative data, such as hectares of land or tons of timber. The monetary information can be used to understand the contribution forests make to the economy.

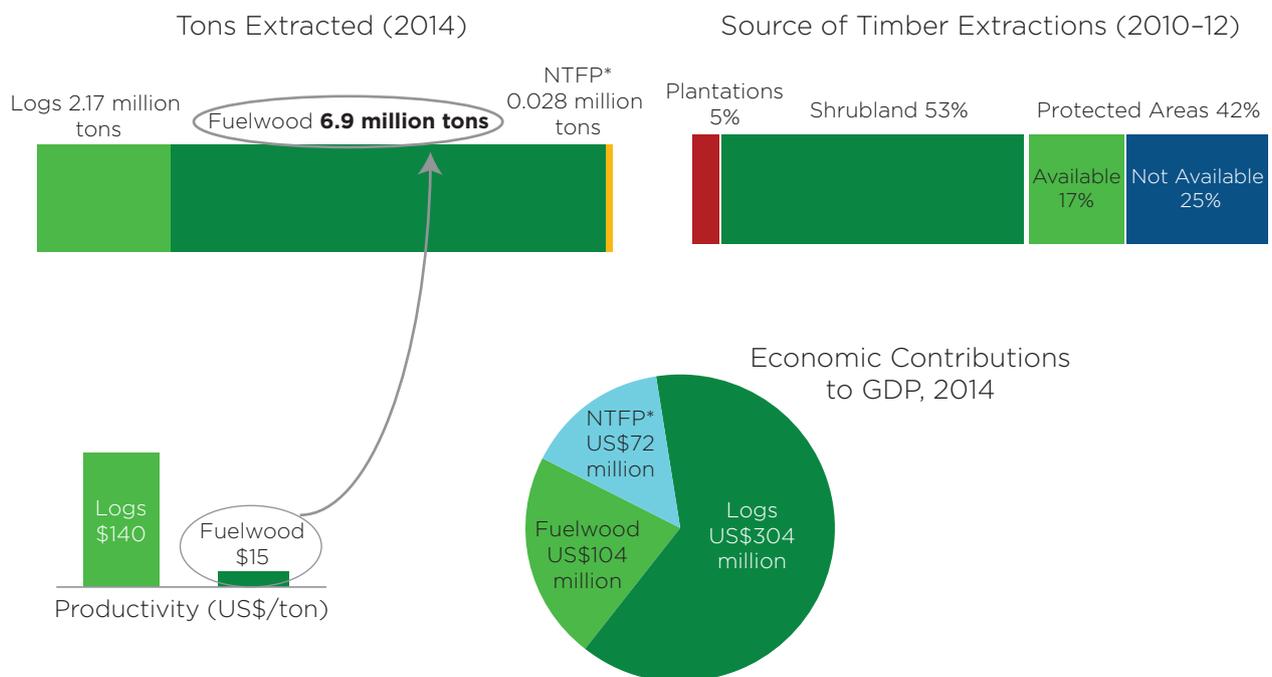
The figure below, which looks at forest use in Colombia, shows that most timber extractions were for fuelwood, which has the lowest economic returns for timber products. A significant percentage of extractions came from “not available” protected areas such as national parks.

Why Is This Important?

This type of data can highlight trends in forest production and identify where investments could be targeted to maximize economic returns. For example, non-timber products such as cork, latex, and resins could be both economically and ecologically sustainable; they account for a tiny fraction in terms of volume but 15 percent of the contribution forest products make to GDP.

The use of fuelwood, meanwhile, has impacts on carbon emissions and on human health. Having detailed data about where and how it is being used can help in designing public policies to encourage people to turn to cleaner sources of energy.

Forest Use and Contribution to the Economy



* Non-timber forest products

Sources: DANE 2017: *Cuenta ambiental y económica de flujos del bosque, en unidades físicas y monetarias*. Departamento Administrativo Nacional de Estadísticas; DANE, IDEAM, MADS 2016: *Avance metodológico de la cuenta ambiental y económica del bosque. Documento de trabajo*.

Card 3 The Role of Forests in Reducing Carbon Emissions in the Philippines

What Do the Accounts Show?

Beyond their ability to supply timber, forests provide valuable ecosystem services. For example, they reduce greenhouse gases by capturing and storing carbon dioxide that would otherwise go into the atmosphere and contribute to global warming. Forest accounts help to measure such services and calculate their monetary value.

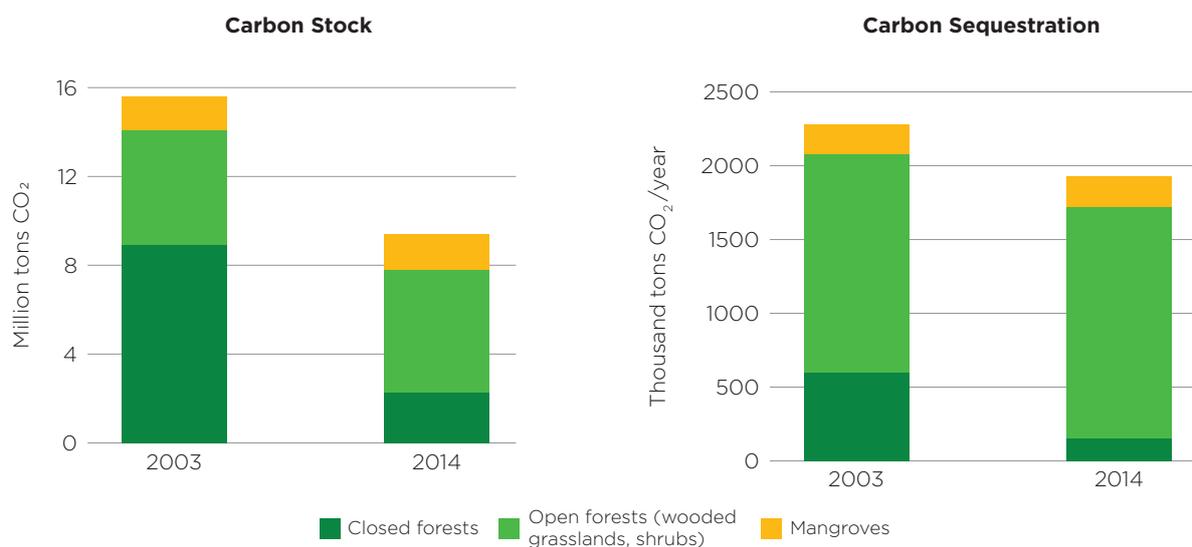
Closed forests are especially beneficial because they store nearly twice as much carbon as open or mangrove forests. Therefore, the rapid decline of closed forests in Southern Palawan in recent years is of particular concern; the total carbon stored in these forests dropped by more than 40 percent from 2003 to 2014.

Why Is This Important?

The information on Southern Palawan can be used to strengthen the Philippine Greenhouse Gas Inventory Management and Reporting System, expand the National Greening Program, and do measurement, reporting, and verification for initiatives under the international framework for reducing emissions from deforestation and forest degradation (REDD+).

In some countries, payment systems provide incentives for investing in forests and managing them sustainably. Forest accounts can provide input for these and other programs, such as the Biodiversity Finance Initiative, the Forest Investment Program, and carbon trading platforms.

Forests and Carbon in Southern Palawan



~US\$7 million lost in carbon stocks in 10 years, mainly from deforestation

US\$18–\$52 million annual value of carbon sequestration—depending on market value of carbon

Card 4 Forests as Key Components of National Development Plans in Colombia

What Do the Accounts Show?

Forests figure prominently in Colombia's National Development Plan and green growth policy, and natural capital accounting lays a solid foundation for better resource management. The country aims to increase land restoration and reduce annual forest losses, with zero net deforestation in the Colombian Amazon by 2020.

Forest accounts point to some of the pressures on the country's forests, including timber extractions from protected areas and overgrazing of cattle. They also show impacts on other ecosystem services, such as carbon sequestration and control of water flow, as well as effects on GDP.

Why Is This Important?

The more information policy makers have about the country's forests, the better equipped they will be to develop effective and sustainable strategies. Looking at the big picture can help them to:

- understand regional variations and fine-tune policies so that actions in one region do not produce negative effects in another;
- design packaged solutions for climate-smart agriculture (including water use, efficiency measures, and financial incentives); and
- assess the impact of policies to get better data on economic returns and to prioritize investments and seed funding.

Colombian Forests at a Glance



Forest cover declined from 57% to 53% (1990-2012)—Existing cover is still significant but pressure continues



Contribution to economy equaled **US\$480 million** in 2014, mostly from timber and logs

Fuelwood accounts for **76%** of the tons of raw materials extracted from forests but has little economic value



42% of timber extractions are from protected areas

58% of those extractions are illegal, from "not available" forests



40% of land is under livestock but only 19% is suitable for grazing

Downstream impacts from unsustainable land use cause soil compaction and affect control of water flow



Loss of carbon stock arising from deforestation amounts to around **7.9 billion tons of CO₂**

60% of water extracted from surface sources is vulnerable to changes in land use and pollution

Sources: DANE 2017: *Cuenta ambiental y económica de flujos del bosque, en unidades físicas y monetarias*. National Administrative Department of Statistics; DANE, IDEAM, MADS 2016: *Avance metodológico de la cuenta ambiental y económica del bosque. Documento de trabajo*.

Card 5 The Real Contribution of the Forestry Sector to Costa Rica's National Wealth

What Do the Accounts Show?

Traditionally, the contribution of forests to an economy is calculated in the form of timber produced—a limited measure that tends to seriously underestimate forests' value. This has been a problem in Costa Rica. Even though the country managed to halt and reverse deforestation in a short period of time, and currently has over 50 percent of forest cover, the value of its forests was placed at less than 0.1 percent of GDP. The forestry sector was perceived as invisible and stagnant, and the Ministry of Environment repeatedly faced budget cuts.

The introduction of the SEEA framework has improved the accounting process and

revealed an “extended forest economy” that amounts to more than 2 percent of GDP. Better accounts track more forest-related products and measure the contribution forests make to carbon sequestration and, when linked to their impact on regulating water flow, to hydroelectricity.

Why Is This Important?

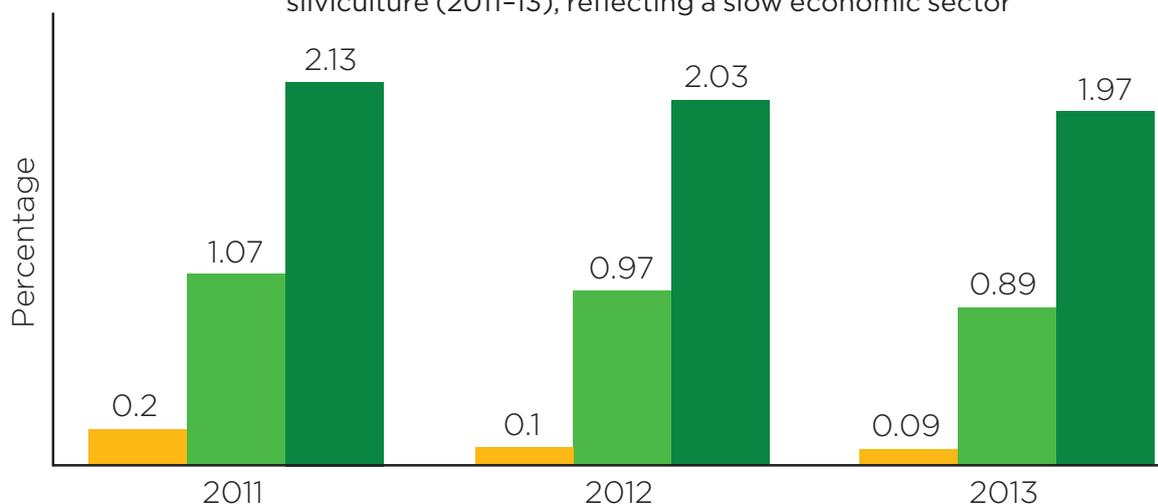
Having a more complex understanding of forests can help shape policy. The information from these accounts contributes to the country's REDD+ strategy, a key component of the National Plan for Forest Development 2011–20. The forest accounts also inform the design of Costa Rica's Payment for Environmental Services program.

Participation of Forests in GDP

13.5% increase in planted forests, incentivized through Payment for Environmental Services program

97,600 more hectares of forest (2011–13)

50% decrease in GDP contributions from silviculture (2011–13), reflecting a slow economic sector



2% of GDP from extended forest accounts, previously estimated at less than 0.1% by traditional accounting

Card 6 Forests, Poverty, and Conflict Resolution in Colombia

What Do the Accounts Show?

Natural capital accounts show that areas with the highest deforestation were linked to the country's armed conflict. From 1990 to 2013, Colombia lost 3 million hectares of forest in municipalities under conflict.

During the same period, 780,000 hectares of the country's forests were converted to unsuitable uses, such as illicit crops. And, 87 percent of illicit crops were being cultivated in municipalities with a high or very high frequency of conflict.

Why Is This Important?

Smart investments in forests and land use are expected to strengthen the country's peace agenda. As the peace process gains traction, the country can prevent further reduction of resources that were badly degraded during the years of conflict.

The accounts are among the sources that have been used to estimate the savings per year of peace in terms of avoided environmental degradation. Conservative estimates place the total annual savings from reduced degradation and deforestation at around US\$900 million.

Environmental Dividends of Peace in Colombia

US\$900 million savings from reduced degradation annually

Environmental Impacts of the Conflict (1990-2013 unless otherwise noted)

3 million hectares of forest were lost in municipalities under conflict, equivalent to the area of Belgium

58% of deforestation took place in municipalities under conflict

1.3 billion CO₂ tons were emitted, equivalent to 13% of China's emissions

780,000 hectares of forests were converted to unsuitable uses (for example, pastures in steep slopes, illicit crops)

1.5 million hectares of soil were degraded and will take at least 20 years to recover

87% of illicit crops were located in municipalities under conflict (2016)

60% of water supplies were at risk from illegal mining extractions and oil spills (2009-15)

Source: DNP. 2016. *Dividendos Ambientales de la Paz. Oportunidades para Construir una Paz Sostenible*. National Planning Department.

Wealth Accounting and the Valuation of Ecosystem Services

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.



www.wavespartnership.org

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1818 H Street, NW, Washington, DC 20433 USA