4.3 Costa Rica

4.3.1. Fact Box

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total estimated value of natural resources to</td>
<td>Not currently available</td>
</tr>
<tr>
<td>the economy</td>
<td></td>
</tr>
<tr>
<td>Natural Capital Growth: average annual</td>
<td>Not currently available</td>
</tr>
<tr>
<td>growth rates, 1990–2008 (from the Inclusive</td>
<td></td>
</tr>
<tr>
<td>Wealth Report [49])</td>
<td></td>
</tr>
<tr>
<td>Status of Ecosystem Services</td>
<td>High level of biodiversity, but ecosystem services are thought to be declining</td>
</tr>
<tr>
<td>Vulnerability to Climate Change and</td>
<td>Having reversed deforestation trends, pollution, soil erosion, urbanisation, increasing demands for energy, agricultural growth and</td>
</tr>
<tr>
<td>Anthropogenic action</td>
<td>climate change are all threats</td>
</tr>
<tr>
<td>National Ecosystem Assessment</td>
<td>There has been no official national ecosystem services assessment</td>
</tr>
<tr>
<td>Key legislation or planned legislation</td>
<td>The Forestry Law 7575 recognises four ecosystem services, but there is no law on ecosystem services accounting</td>
</tr>
<tr>
<td>National Biodiversity Strategy and Action</td>
<td>Costa Rica Estrategia Nacional de Biodiversidad submitted the CBD in 2000 [105]</td>
</tr>
<tr>
<td>Plan</td>
<td></td>
</tr>
</tbody>
</table>
4.3.2. Abbreviations: Costa Rica

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCCR</td>
<td>Costa Rica’s Central Bank, Banco Central de Costa Rica</td>
</tr>
<tr>
<td>CENIGA</td>
<td>National Geo-environmental Information Centre, Centro Nacional de Información Geoambiental</td>
</tr>
<tr>
<td>FBS</td>
<td>Sustainable Biodiversity Fund, Fondo para la Biodiversidad Sostenible</td>
</tr>
<tr>
<td>FONAFIFO</td>
<td>National Forestry Fund, Fondo Nacional de Financiamiento Forestal</td>
</tr>
<tr>
<td>INEC</td>
<td>National Statistics Agency, Instituto Nacional de Estadística y Censos</td>
</tr>
<tr>
<td>MINAE</td>
<td>Ministry of the Environment and Energy, Ministerio de Ambiente, Energía</td>
</tr>
<tr>
<td>MINAEM</td>
<td>Ministry of the Environment, Energy and Seas, Ministerio de Ambiente, Energía y Mares</td>
</tr>
<tr>
<td>MINAET</td>
<td>Ministry of the Environment, Energy and Telecommunications, Ministerio de Ambiente, Energía y Telecomunicaciones</td>
</tr>
<tr>
<td>MMBIEM</td>
<td>Mainstreaming Market Based Instruments for Environmental Management</td>
</tr>
<tr>
<td>NASCA</td>
<td>Northern Andes and Southern Central America</td>
</tr>
<tr>
<td>PSA</td>
<td>Payments for Ecosystem Services, Pago por Servicios Ambientales</td>
</tr>
<tr>
<td>SINIA</td>
<td>National Environmental Information System, Sistema Nacional de Información Ambiental</td>
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</tbody>
</table>

4.3.3. Background

Ecosystem services are a major source of income for Costa Rica, particularly through tourism, pharmaceutical prospecting and other services. 91% of power generation now comes from renewable sources, of which 73% is from hydropower. Over 20 years ago, Costa Rica had one of the highest deforestation rates in the world. Since then, Costa Rica has reversed the trend for environmental degradation\(^1\) and is now recognised for its strong environmental protection policies and sustainable management of natural capital. In 1997, Costa Rica became one of the first countries to establish a national PES programme [76] and to sell carbon credits internationally [106], and more recently has committed to carbon neutrality\(^2\) and pursuing green growth as reflected in the mining ban and a three-year moratorium on oil and gas explorations.

4.3.3.1. Status of national ecosystems and ecosystem services

Costa Rica is a small country with high biodiversity, with 13,680 species currently recorded in seven ecoregions, of which 850 are birds (19 currently threatened), 205 are mammals (9 threatened) and 7.6% are endemic to the country [76].\(^3\) Agricultural land makes up 35.2% of total land, while forested areas make up around 50%. Total converted land is 49.4%, while terrestrial protected areas make

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\(^1\) The deforestation rate decreased from 43,000 ha in 1983 and 13,000 in 1993, to an average of 5,000 ha in the last 5 years.

\(^2\) Http://www.unccd2012.org/.

\(^3\) Figures given at www.cbd.org vary slightly from this.
up around 20% of total land area, including national parks (12% of the country), biological reserves, protected areas, forest reserves, wildlife refuges and wetlands. However, Balvanera et al. (2012) [76] calculate that natural resources are being depleted by 0.14% GNI and other sources report damage to ecosystems, particularly marine and coastal systems (see [107] and other articles from the same issue).

4.3.3.2. Ecosystems vulnerability to climate change and anthropogenic action
Population growth, urbanisation, increasing energy demand and agricultural developments are all putting pressure on Costa Rica’s natural resources. Although deforestation is no longer the threat it once was, soil erosion and water pollution are now threatening ecosystems, particularly marine and coastal resources. The MA sub-global assessment in Costa Rica’s Chirripó River basin identified logging, poaching, pollution and ecosystem fragmentation due to the unsustainable agricultural practices of non-indigenous people as current threats to the forested study area [108].

Climate change is predicted to have a negative impact on biodiversity and ecosystem services in Costa Rica. In particular, impacts to cloud forests may exacerbate risks of flooding and drought.4

4.3.4. Assessing natural capital
4.3.4.1. Institutions and institutional capacity for environmental accounting
The National Statistics Agency, INEC, and the Ministry of Environment and Energy (MINAE),5 are responsible for collating information on environmental statistics and indicators,6 which are put into the Sistema Nacional de Información Ambiental (SINIA) which acts as a base from which to determine the state of the environment and natural resources. SINIA was conceived to be a resource base for data and publications, coordinated between the National Geo-environmental Information Centre, Centro Nacional de Información Geoambiental (CENIGA), of MINAE and INEC.

4 Http://www.eeg-regionalcentrelac-undp.org/.
5 Sometimes referred to simply as the Environment Ministry, MINAE was known as the Ministry of Environment, Energy and Telecommunications (MINAET) from 2006. It reverted back to MINAE on 1 February 2013 after the telecommunications portfolio was moved to the Ministry of Science and Technology (MICIT). A bill currently in the Legislature will change the name once more to the Ministry of Environment, Energy and Seas (MINAEM) as the ministry takes on the waters and seas portfolio. See http://www.minae.go.cr/index.php/2012-06-08-20-19-22/quienes-somos.
6 Www.inec.go.cr.
The lead agencies for environmental accounting are MINAE and the Central Bank (BCCR). In addition, the National Statistics Agency (INEC), the Ministry of Finance and the Ministry of Planning are also involved.

4.3.4.2. Ecosystem and ecosystem services assessments
There has been no national ecosystem service assessment, but ecosystem services in Costa Rica have been mapped and assessed through a number of international efforts, at least in part. The Natural Capital Project set up in 2009 maps ecosystem services in the Northern Andes and Southern Central America (NASCA) region, spanning seven countries in Latin America, including much of Costa Rica, using InVEST software and other tools to generate information that can guide and inform decision making.

Numerous studies on ecosystems valuation from NGO and academia, including a Millennium Ecosystem Assessment sub-global report, assessed ecosystem services in parts of the Chirripó River basin [108].

4.3.4.3. Natural capital/environmental services accounts
Costa Rica was one of the first countries to create natural resource accounts, with the World Resource Institute (WRI) and government counterparts compiling accounts for forestry, soil erosion and fisheries as early as 1991 [109], reported in [110]. Since then, there have been examples of natural resource accounting (e.g. [111, 112]), but little is known about the value of tourist revenue generated by forests and protected areas, and the value of any benefits to local communities. Natural capital and ecosystem accounts are not currently incorporated into national accounts. However, INEC and MINAE together produce statistical reports on a range of subjects, including: air quality and emissions, hydrological resources, forest cover, biodiversity, climate, energy, sustainable development indicators and institutional management of the environment, which will aid in the development of natural capital accounts.

Pilot natural capital accounts
The Costa Rican government and WAVES project are now planning to produce pilot natural capital accounts. Asset accounts will be produced for priority areas, identified as water, forests and marine resources. In addition, there will be more

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7 Http://www.naturalcapitalproject.org/nasca.html.
9 Available at http://www.inec.go.cr.
explicit consideration of ecosystem services in existing tourism satellite accounts. This will be a useful tool for policy-makers to help determine the effectiveness of alternative policies. In addition, an opportunity to incorporate natural capital accounts into the national system during the existing Costa Rica CAB Project (2012–2014), which will change the base year and update national accounts (2012–2014), was identified in a workshop in May 2012.

4.3.5. Governance
4.3.5.1. Governance bodies for natural capital
The WAVES pilot natural capital accounts will be led by a Steering Committee consisting of the MINAE and the Central Bank of Costa Rica (BCCR), together with the INEC. The committee provides overall leadership of the project, and together with the country coordinator, MINAE, will also monitor and report on policy dialogue and planning with non-governmental stakeholders.

4.3.6. Current initiatives based on ecosystem services
Costa Rica has a well-established system of PES schemes (see Box 8 [p. 37, above] for PES definitions) and has become known as a leader in developing innovative financing mechanisms for conservation. A recent study identified 28 PES projects of varying sizes currently in operation in Costa Rica [76]. These include national government paying protected area managers for hydrologic services, hydroelectric and water suppliers paying local communities or NGOs for biodiversity values, carbon sequestration projects to pay local landowners, carbon offset purchasers funding the maintenance of production services, and ecotourism operators and commercial bioprospectors paying for aesthetic qualities, many of these through the national PSA scheme (see below).

4.3.6.1. National PSA scheme
In 1997, Costa Rica became the first country to establish a national PES or *Pago por Servicios Ambientales* (PSA) scheme and to adopt the terminology of environmental services. In this scheme, landowners are compensated for activities identified as contributing to ecosystem services or a sustainable environment, such as reforestation, sustainable forest management, forest conservation and regeneration activities. Landowners are under contract to manage or protect their forests for 20 years and are obliged to follow a management plan that applies to all future purchasers of the land. Carbon offsets and watershed protection are then sold to domestic and international buyers, via the government, to compensate landowners.

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Since its inception, the scheme has been mainly (around 80%) financed by allocating the revenue from a 3.5% tax on fossil fuel sales (about US$10 million per year in 2006) to FONAFIFO,\(^{11}\) the semi-autonomous National Forestry Fund that administers the PSA programme. Additional funds supporting the project have also come from revenues from a forestry tax, a World Bank loan (through the Eco-markets Project, 2001–2006), grants from the GEF,\(^{12}\) the German government (for forest protection) and the Norwegian government (for carbon sequestration), Conservation International (for agroforestry contracts and tree planting) and from 2007 through the World Bank Mainstreaming Market Based Instruments for Environmental Management (MMBIEM) project. In addition, GEF funds for the Costa Rica component of a silvopastoral scheme in three countries were also channelled through the PSA programme [113, 114] (see Box 9).

The Costa Rican PSA scheme built on previous initiatives, such as the incentives for timber plantations, mainly through tax rebates, in the 1970s, later broadened through the Forest Credit Certificate, CAF (Certificado de Abono Forestal) [115], in 1986 and the Forest Protection Certificate, CPB (Certificado para la Protección del Bosque), in 1995. These meant that when the PSA scheme began, there was already a system of payments for reforestation and forest management and the management institutions in place.

The PSA programme in Costa Rica is widely regarded as a success [116]. In its first five years, payments were made to over 4,400 people [117], and in the first 8 years of implementation, half a million hectares (a fifth of the country’s forested area) was enrolled in the scheme. The significant decrease in deforestation is also largely attributed to the PSA scheme. In 1900, 85% of Costa Rica was forested, but by 1987 that had decreased to only 29%. Following significant changes in the 1990s, in 2008 forest cover had increased to 51% [118]. However, there are limits to what PES schemes can achieve. In Costa Rica, within the 1.4 million ha of biodiversity priority conservation areas outside of protected areas, carbon and water financing is a significant option for about 0.2 million ha and 0.3 million ha respectively. A Biodiversity Conservation Trust Fund (Fondo para la Biodiversidad Sostenible, FBS), set up to provide long-term conservation payments in this area, provides some funds for the remaining 0.9 million ha, but despite efforts the local tourism industry have so far avoided providing financing [112].

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\(^{11}\) Http://www.fonafifo.com.

\(^{12}\) Grants for PES schemes from International donors such as GEF are sometimes considered as payments from the global community for the biodiversity services provided by Costa Rica’s forests.
Hydropower

FONAFIFO has now reached a number of agreements with water users for them to pay for the water services they receive. This started as a voluntary scheme with hydropower producers [119], but in 2005, Costa Rica introduced a compulsory water tariff, of which only a portion is channelled through the PSA programme, and the rest of which is allocated to the Ministry of Environment and to protected areas. Funds are used for national water management, specific conservation projects and for the conservation, maintenance and restoration of the basin ecosystem, including the purchase of land for groundwater protection and for protecting significant water sources [120]. See Box 11 (p. 80, below) for details of watershed funds.

Box 9. Silvopastoral Systems

In the past, the clearing of land to make way for permanent pasture was one of the main causes of primary forest deforestation in Central America [82]. In an effort to reduce pressure on primary forest from ranching-induced deforestation, the World Bank Silvopastoral Scheme\(^\text{13}\) was established to introduce payment incentives for farmers adopting integrated silvopastoral farming systems in degraded pasture lands in three countries, Costa Rica, Colombia and Nicaragua. The project developed technologies to help control livestock-induced deforestation, addressed socio-economic issues linked to livestock grazing and identified means to overcome barriers (e.g. financial, knowledge or policy) to the adaptation of silvopastoral systems.

The project was largely successful. The change to silvopastoral systems allowed farmers to increase productivity (i.e. local socioeconomic benefits) and reclaim degraded soils, and also provided improvements to ecosystem function and global conservation benefits. Between 2003 and 2008, the accumulated PES per farm was US$2,500, US$2,400 and US$2,300 for Costa Rica, Nicaragua and Colombia, respectively, resulting in 12,262 hectares of improved biodiversity and carbon sequestration indices. In addition, the project demonstrated improvements to other ecosystem services, including better water infiltration, soil retention, soil productivity, reduction of fossil fuel dependence (e.g. substitution of inorganic fertiliser with nitrogen fixing plants), diversification of farm benefits, scenic beauty enhancement and land rehabilitation. One innovative element of the project was that payments varied depending on the degree of environmental service being provided. This eliminated inefficiencies and allowed farmers to decide the degree of conservation effort they were willing to make [121].\(^\text{14}\)

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\(^{14}\) Projects to scale up these schemes also include adjustments for farm location, as similar land use changes in different areas will provide different environmental services that should not be equally rewarded.
4.3.7. Legislation

4.3.7.1. Policy
Costa Rica has a stated “green growth strategy”. It has committed to carbon neutrality, increasing the share of hydropower, expanding eco-tourism and sustainable management of forest and marine resources.\(^\text{15}\) Mining activities are also banned and there is a three-year moratorium on oil and gas exploration.

The National Biodiversity Strategy and Action Plan aims to promote the conservation and fair and equitable use of the country’s biodiversity. One of its thirteen strategic points is the “internalisation of costs for environmental services and incentives”.\(^\text{16}\)

4.3.7.2. Support and implementation of international objectives
Costa Rica is a signatory to the CDB, and as such submitted the *Costa Rica Fourth National Report to the Convention on Biological Diversity* in 2009 [122] and the National Biodiversity Strategy and Action Plan [104]. Costa Rica has also ratified international agreements such as the Convention on Biological Diversity and its Protocol on Biosafety, laws which are supported by a mandate stipulated in Article 50 of the Political Constitution of the Republic of Costa Rica [123].

4.3.7.3. Legislation (planned or in force)
1996 Forestry Law No. 7575
There is currently no law on natural capital accounting, but ecosystems have been recognised as providing critical services. In 1996, Costa Rica adopted Forestry Law No. 7575, legally recognising four critical services provided by forest ecosystems, namely (1) carbon sequestration, (2) hydrological services (including provision of water for human consumption, irrigation and energy production), (3) biodiversity protection and (4) scenic beauty for recreation and tourism [112]. This law also established a framework for payments to landowners for these ecosystem services, and established the National Fund for Forestry Financing, FONAFIFO,\(^\text{17}\) to manage the PSA. In addition, the Forestry Law also prohibits forest conversion and requires all working forests to be placed under an approved management plan.

Since then, a number of decrees have been introduced, adapting the forestry law and affecting the national PSA scheme. These include:

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\(^{15}\) See National Development Strategies on energy, tourism, water, forest and marine resources.


\(^{17}\) Article 46.
• **Fiscal Simplification and Efficiency Law No. 8114** (2001) fixing FONAFIFO’s share of fuel tax revenues to 3.5%, guaranteed through the Ordinary National Budget\(^{18}\).

• Fiscal Simplification and Efficiency Law No. 8114 (2002) introducing an agroforestry contract

• **Executive Decree No. 30762** (2002) giving FONAFIFO all management of PES, excluding the organisations budget, which must be approved by the ministry of finance.

• **Law No. 8058** regarding World Bank and GEF funding for PES

• **Law No. 8355** regarding PES funding from the German aid agency KfW, and from Conservation International

• **Presidential Decree No. 32868** (2005), inaugurating and regulating the Water Charging Scheme.

• **Biodiversity Law No. 7788 (1998)**, stipulating the protection and consolidation of protected wildlife areas, including provisions for PES schemes [123]

For details of forestry laws relevant to PES before 1996, see Bennett and Henninger (2009) [118].

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\(^{18}\) Originally, article 69 of the Forestry Law 7575 assigned one-third of fossil fuel tax revenues to FONAFIFO.