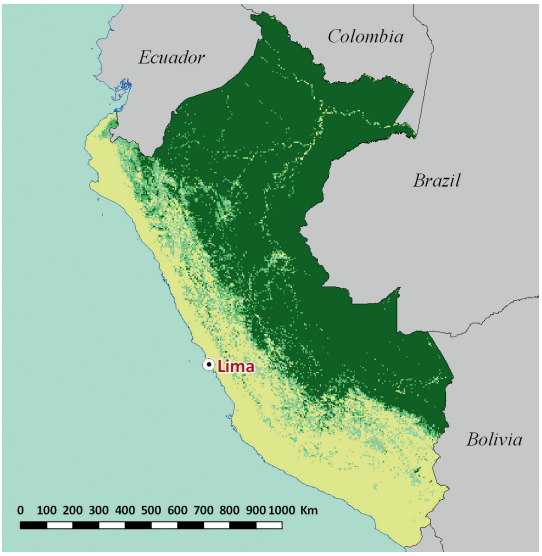
PERU



Forest resources

Peru has a land area of 129 million hectares and an estimated population in 2010 of 28 million people (United Nations Population Division 2010). It is ranked 78th out of 182 countries in UNDP's Human Development Index (UNDP 2009).

Peru has three broad ecoregions: the desert coastal region, which covers 13.6 million hectares; the semi-arid Andean mountain range (*sierra*), which covers 39.2 million hectares; and the Amazon Basin, including the eastern humid slopes of the Andes, covering 75.7 million hectares. FAO (2010a) estimated Peru's forest cover at 67.9 million hectares, which is 53% of the total land area; 92% of these forests are in the Amazon Basin. Other estimates of forest area include 71.3 million hectares[a] and 72 million hectares (Government of Peru 2010).

Forest types. The main forest type in Peru is humid forest (rainforest) in the Amazon. It covers about 57 million hectares, with sub-types that depend on altitude and soils, particularly their position in relation to rivers. Terrace and hill forests – on rolling terrain with moderate slopes – are the most widespread humid forest sub-type, covering about 37 million hectares. The alluvial forests, including those on the lower river terraces, offer some of the best potential for integrated forest management and agroforestry because of their vigorous growth, flat terrain and good accessibility; their upper stories are generally 35–40 m in height. These forests have been used intensively in the past, leaving large expanses of secondary forest (*purma*) dominated by stands of fast-growing, light-demanding pioneer species.

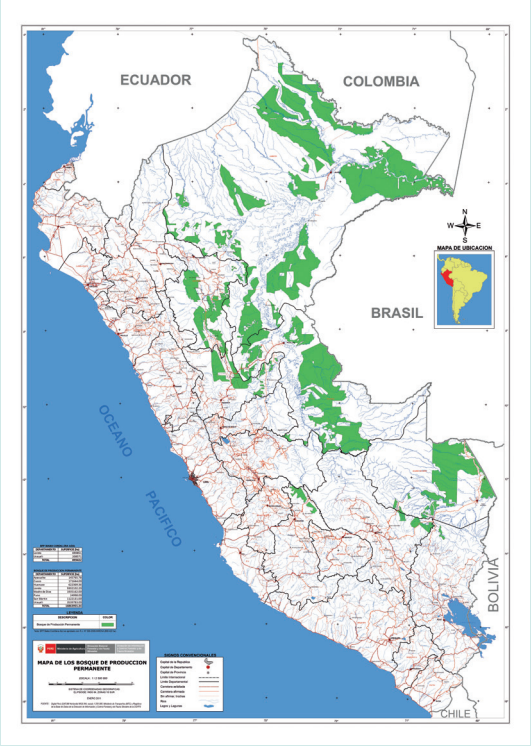
There are about 11.2 million hectares of arid and semi-arid forests on the coast and semi-humid forests in mountain and inner-mountain valleys.[a] Peru has about 5300 hectares of mangroves at Tumbes, in the extreme north bordering Ecuador (Spalding et al. 2010).

Permanent forest estate. Under the 2000 Forest Law (*Ley 27308/2000*), the forest is classified into the following categories: production forests (permanent and in reserve); forests on protection land; forests for future use (forest plantations, secondary forests and degraded forests for restoration); natural protected areas; forests in Indigenous and rural communities; and local forests. Permanent production forests are intended for timber and non-timber production and the conservation of forest resources, and an approved forest management plan is required. As of 2010, 33.3 million hectares of permanent production forests had been classified within the PFE.[a] However, only an area of 18.7 million hectares has so far been allocated for production purposes (Kometter 2010), and this figure is used in Table 1 for the production PFE. The area of protection forest is about 19.4 million hectares, including forests designated in the national protected-area system, privately protected areas, and regional protected areas (*áreas de conservación regionales*).[a] About 15.4 million hectares of forests are unallocated. The total planted forest is estimated at 820 000 hectares[a], nearly 600 000 hectares of which are for timber and fuelwood production and the remainder are for protection.[a] The map in Box 1 shows Peru's production forests.

Forest ecosystem health

Deforestation and forest degradation. The estimated average annual rate of forest change in Peru in the period 1990–2000 was 269 000 hectares, or 0.4%; between 2000 and 2010 it was 94 000 hectares (0.1%) (FAO 2010b). Direct causes of deforestation include the development

Box 1 Permanent production forests, Peru



Note: *Inserted as supplied, in original language.*
Source: *Government of Peru.*

of new infrastructure such as highways (e.g. *carretera* Iquitos–Nauta, the Brasil–Peru Inter-ocean Highway and *carretera* Pucallpa–Lima); new settlements in the Amazon Basin, including the expansion of urban centres; the expansion of the agricultural frontier, including for cash crops and shifting cultivation; the expansion of oil exploitation and hydro-electric schemes; mining in the southern part of the Peruvian Amazon; illegal logging; and the illicit cultivation of coca (Government of Peru 2010). Indirect causes of deforestation include migration to the Amazon region; agricultural policies favouring cash-crop development; development policies that favour energy generation; and new investment opportunities due to globalization (ibid.). About one-third of the forest estate is degraded or secondary (Table 2).

Vulnerability of forests to climate change. Peru is highly vulnerable to climate change, having low-lying coastal areas; arid and semi-arid areas, forested areas and areas liable to forest decay; areas prone to natural disasters; areas liable to drought and desertification; areas of high urban atmospheric pollution; areas with fragile ecosystems, including mountainous ecosystems; and an economy that is highly dependent on income generated from the production, processing, export and/or on consumption of fossil fuels and associated energy-intensive products.

Peru has 70% of the world's tropical glaciers, many of which are retreating at a rapid rate (there has been a decrease of 30% of glacial mass in 40 years; Government of Peru 2008). A prolonged glacial melt will exacerbate water shortages, mainly in the drier areas of the country.

Peru is strongly affected by hydro-meteorological phenomena associated with el Niño. An estimated 72% of registered emergencies (e.g. droughts, heavy rains, floods, frosts, hailstorms, avalanches and landslides) are related to these phenomena, which increased more than six-fold between 1997 and 2006. Climate models project that el Niño will intensify in coming decades.

According to the Government of Peru (2008), there was a mean increase in temperature in the 20th century of 0.31 °C and climate models project that there will be a minimum increase in mean temperature of 2.6 °C in the next 50 years. Almost the entire agricultural sector is suffering from

Table 1 Permanent forest estate

Reporting year	Estimated total forest area, range (million ha)	Total closed natural forest ('000 ha)	PFE ('000 hectares)			
			Production		Protection	Total
			Natural	Planted		
2005*	65.2–86.4	64 204	24 600	200–300	16 300	41 150
2010	**67.9–72.0**	**55 990****	**18 700‡**	**820†**	**19 400**	**38 920**

* *As reported in ITTO (2006).*
** *Calculated using the ratio of forest with greater than 60% forest cover estimated by UNEP-WCMC (2010) (81%) and the total natural forest area as estimated by FAO (2010).*
‡ *Includes only state production forests for timber use.*
† *Comprises 580 000 hectares of production plantation, 240 000 hectares of plantations for protective purposes.*

Table 2 Forest condition

	PFE	Non-PFE	Total
	'000 ha		
Area of primary forest	30 300	10 400	40 700
Area of degraded primary forest	5600	7100	12 700
Area of secondary forest	1200	4500	5700
Area of degraded forest land	-	-	-

Source: Derived from Government of Peru (2010).

increasing water stress due to melting glaciers and changing precipitation patterns. The productivity of especially small-scale agricultural production systems is under threat, particularly in mountainous regions, jeopardizing the income of smallholder families**.**

Through a supreme decree, the Government of Peru recently established the National Commission for Climate Change (*Comisión Nacional de Cambio Climático*) led by the Ministry of Environment (*Ministerio del Ambiente* – MINAM) comprising representatives of government agencies, NGOs and the private sector. The 2003 Climate Change National Strategy is being updated. Forests and trees play an important role in Peru's climate-change adaptation strategy. However, adaptation and mitigation strategies remain separate, and forest activities are considered to deal with mitigation rather than adaptation.

SFM policy framework

Forest tenure. Table 3 shows Peru's forest area by tenure. Forest lands are classified as public forests, Indigenous forests or private forests. Communities own an estimated 12.6 million hectares of the country's forests (ITTO & RRI 2009), and nearly 1200 Indigenous communities possess land rights in the Peruvian Amazon. However, there is uncertainty over this ownership.[a]

Criteria and indicators. Peru has developed standards for forest management. It has adopted national C&I based on the Tarapoto Process, and concession management plans are based on these. The Government of Peru used the ITTO C&I in its submission to ITTO for this report.[a]

Forest policy and legislation. The revised national forest strategy prepared in 2002 was officially adopted by the Peruvian government in August 2004 (in *Decreto Supremo* 031-2004-AG) (ITTO 2006). It is implemented through the Forestry and Wildlife Law (*Ley Forestal y de Fauna Silvestre – Ley* 27308), which was adopted in 2000. The law prescribes several options for SFM and reforestation, including 40-year concessions for commercial timber, NTFPs, ecotourism and environmental services (Article 10); the sustainable management of forests belonging to Indigenous communities (Article 12); the sustainable management of local forests by local governments and rural populations (Decree 014/2001); and the establishment of 40-year reforestation concessions (Article 28) (ITTO 2006).

As a consequence of the ratification of the United States–Peru Trade Promotion Agreement, in 2007

Table 3 Forest area, by tenure

Ownership category	Total area*	Of which PFE	Notes
	'000 ha		
State ownership (national, state or provincial government)	54 500**	39 300	PFE: publicly administrated forests, including forest concessions for timber and Brazil nut, state reforestation and protected areas.[a]
Other public entities (e.g. municipalities, villages)		2900	Forests reserved for communities and Indigenous groups (ITTO & RRI 2009).
Owned by local communities and/or Indigenous groups	13 200	13 200	*Tierras de comunidades indígenas* (ITTO & RRI 2009).
Private owned by individuals, firms, other corporate	1950	1650	Industrial owners and smallholders combined.[a] (ITTO & RRI 2009 gave a figure of 5.2 million hectares.)

* *Note that the total is in the range given in Table 1.*

** *Includes 15.2 million hectares of forests that are not yet classified.*

the Government of Peru embarked on a process to reform the forest policy and law as well as to restructure and decentralize the system of forest administration and governance. This was done on a fast track through a series of supreme decrees, including the issuance of a new forest law. However, the outcome was highly controversial and led to a prolonged period of (at times violent) protest by civil society and Indigenous people. Ultimately it led to the rescinding of the forest law and other related decrees and to the formation of a national roundtable for dialogue and reconciliation.

The approval of transference of responsibilities from the National Institute of Natural Resources (*Instituto Nacional de Recursos Naturales* – INRENA, the former forest service) to regional governments for forest-sector administration and governance was enacted by Supreme Decree No 011-2007-AG. Decentralization focuses on four key faculties: administration; control; monitoring; and promotion. The process of decentralizing facilities to regional governments has been slow and problematic, and the transfer of funding and resources is proving to be a major obstacle.

Based on the extended reform dialogue since 2007, a process to completely review the forest law and forest policy was launched in 2009 through the creation of a multi-stakeholder platform to advance the reform process in a participative and transparent way. The proposed new law emphasizes issues relating to the governance of forest resources and SFM and particularly refers to participatory forest management and the need to apply the principle of free, prior and informed consent to the management and conservation of forest resources. The draft law proposes the creation of the National Forest and Wildlife Service (*Servicio Nacional Forestal y de Fauna Silvestre* – SERFOR) under the Ministry of Agriculture as the national forest authority. It further recognizes regional governments as the regional forest authorities following the prescriptions of Article 51 of the Organic Law on Regional Governments (*Ley Orgánica de Gobiernos Regionales*).

The National Forest Conservation Program for Climate-Change Mitigation (*Programa Nacional de Conservación de Bosques para la Mitigación del Cambio Climatico*) was launched in July 2010 and is considered to be the country's major forest development plan. The project Conserving Community Forests (*Conservando Bosques Comunitarios*) is the Program's first intervention, aiming to generate direct financial transfers to Indigenous communities that contribute to forest conservation.

Institutions involved in forests. Restructuring and decentralization processes are ongoing in the administration of forests in Peru and there have been rapid and sometimes chaotic changes (Kometter 2010). The first steps were taken in 2007 with the dismantling of INRENA and the redistribution of its forest administration and governance functions to the Ministry of Agriculture (*Ministerio de Agricultura* – MINAG), the newly created MINAM, and the Agency for the Supervision of Forest Resources and Wildlife (*Organismo Supervisor de Recursos Forestales y del Fauna Silvestre* – OSINFOR). OSINFOR was created in June 2008 under the Presidency of the Council of Ministers (*Presidencia del Concejo de Ministros*) and oversees forest-related taxation, the sustainable management of forest goods and services and forest conservation. Within MINAG, a new General Directorate of Forests and Wildlife (*Direccion General de Flora y Fauna Silvestre* – DGFFS) was created in 2008. However, for most of the period since its creation the DGFFS has operated with a very limited budget and few staff. In mid 2010, based on the proposals made in the draft forest law, SERFOR was made operational under MINAG, with particular functions in a new system of decentralized forest management under the regional authorities for forests and wildlife (Government of Peru 2010). The National Service for Protected Areas (*Servicio Nacional de Areas Naturales Protegidas* – SERNANP) under MINAM manages the National System of Public Protected Areas (*Sistema Nacional de Areas Naturales Protegidas por el Estado* – SINANPE). MINAM is also responsible for the development of REDD+ in Peru.

Indigenous peoples' associations have an increasing influence on the development of forest policies in Peru. The Inter-ethnic Association for Development of the Peruvian Jungle (*Asociación Interétnica de Desarrollo de la Selva Peruana*) and the National Institute for the Management of Andean, Amazonian and Afro-Peruvian Settlements (*Instituto Nacional de Desarrollo de Pueblos Andinos, Amazónicos y Afroperuanos*), which deals with the protection of the interests and cultural heritages of Indigenous peoples in Peru as well as territorial reform, are both strongly involved in forest issues.

Box 2 Active forest concessions by administrative region (December 2009)

Region	Number of concessions	Total area (ha)	Average area (ha)
Huánuco	48	284 342	5923
Loreto	250	2 644 756	10 579
Madre de Dios	85	1 267 111	14 907
San Martin	34	494 668	14 549
Ucayali	171	2 871 925	16 794
Total	**588**	**7 562 802**	**12 861**

Source: Based on Kometter (2010).

The National Strategic Planning Centre (*Centro Nacional de Planeamiento Estratégico*) also plays a role on questions relating to forest-tenure allocation and forest use.

National development institutions such as the Peruvian Amazon Research Institute (*Instituto de Investigación de la Amazonía Peruana*) continue to play important roles in the promotion of SFM at the local level. National and international NGOs are very active in Peruvian forestry and are influential in the development of policy. For example, WWF Peru, *Foro Ecológico*, Conservation International Peru, ProNaturaleza (*Fundación Peruana para la Conservación de la Naturaleza*) and *Red Ambiental* are important in driving forest conservation and the forest concession reform process. Various private-sector organizations are also involved, the most active being the National Forestry Chamber (*Cámara Forestal Nacional*), the National Timber Corporation (*Corporación Nacional de la Madera del Perú*) and regional forest producer associations, in particular those of Madre de Dios and Ucayali. The University Agraria La Molina has a strong forestry faculty that is actively involved in SFM research and serves in an advisory capacity to MINAG regarding CITES listings of timber species.

Status of forest management

Forest for production

Details on the allocation of forest concessions in Peru given in ITTO (2006) were still valid in 2010. As of the end of 2009, 588 forest concessions had been registered in the Huánuco, Loreto, Madre de Dios, San Martín and Ucayali regions of Peru over a total area of 7.56 million hectares (Kometter 2010; Box 2). Five hundred forest concessions had approved and valid contracts with government, 27 concession contracts were under review, contracts had been annulled in 29 concessions, and 32 contracts were in the process of annulment. Of all concessions (most of them established between 2002 and 2004), 85% had contracts at the beginning of 2010 (Kometter 2010).

The average area per concession is quite small – 12 900 hectares. Given their relatively small size, their financial viability will depend in large measure on their ability to obtain good prices. Many are in formerly selectively harvested areas such as the flood zone along Amazonian tributaries and constitute what in some areas will be the third intervention within the last 30–40 years (ITTO 2006). Since many primary species are no longer present in large volumes, the concessions are increasingly harvesting lesser-known species and intensifying their logging operations.

In addition to forest concessions, there are two other concession types that allow for the exploitation of timber: Brazil nut concessions and reforestation concessions. There are a total of 983 Brazil nut concessions, all located in Madre de Dios, covering an area of 864 000 hectares (Kometter 2010). As of the end of 2009, 293 reforestation concessions covering 135 000 hectares were registered in Peru, with most (245) located in Madre de Dios over an area of 112 000 hectares.

The forest law still in force (Law 27308, 2000) specifies forest audits every five years. The renewal or suspension of concession agreements depends absolutely on the results of such audits, which are based on the application of a set of C&I for SFM derived from ITTO and the Tarapoto Process (ITTO 2006). In addition, inspections are still being carried out in forest concessions as part of the country's CITES Appendix II mahogany observation strategy (Kometter 2010).

Silviculture and species selection. The regulations for concession agreements require the application of

detailed silvicultural prescriptions. Concessionaires must apply a polycyclic management system with a minimum rotation of 20 years.[a] A minimum diameter limit is determined for each species, and at least 10% of adult trees of each species must be retained in each harvest area as seed trees.[a] Liberation thinning, refinement and enrichment planting are specified to help regenerate forests after harvesting.

At least 100 species are used for timber, but about 25 meet 80% of the demand.[a] In the past, the most important timber species harvested in the Peruvian Amazon was *Swietenia macrophylla* (caoba). While still an important species, caoba is no longer in the top ten harvested species by volume. However, the falsification of information concerning the illegal cutting of caoba and other illegal practices have been reported: in 2008, for example, 32 concessions covering an area of more than 400 000 hectares were prosecuted for such offences.[a]

Peru and Bolivia are the largest exporters of caoba, while *Guazuma* spp (bolaina) and *Calycophyllum spruceanum* (capirona) are the most traded species in the domestic market. Other important species include *Virola* spp (cumala) *Amburana cearensis* (ishipingo), *Dipteryx micrantha* (shihuahuaco), *Hura crepitans* (catahua) and *Cariniana decandra* (cachimbo). Table 4 shows the five most commonly harvested species, ranked by average sawnwood production for the period 1991–2008. The most important fuelwood species are *Prosopis pallida* (algarrobo), *Eucalyptus globulus* (eucalipto), *Calycophyllum spruceanum* (capirona), *Acacia macracantha* (huarango) and *Polylepis* spp (queuña).[a]

Planted forest and trees outside the forest. Peru has the third-largest area of forest plantations in tropical America (820 000 hectares). Most plantations are located outside the Amazon in the Andes and the main species being planted are *Eucalyptus globulus*, *Polylepis* spp and *Alnus acuminata.* Many of these plantations are on poor soils and have had only limited success.[a] Reforestation was declared of national interest by Supreme Decree 003-2005-AG (2005); a national reforestation plan has been developed and is to be launched shortly.

In the Amazon, a considerable number of long-term reforestation and enrichment-planting trials of native species such as *Cedrelinga catenaeformis* (tornillo), *Simarouba amara* (marupa), *Parkia velutina* (pashaco) and others in the Peruvian Amazon (e.g. in Jenaro Herrera, Bosque Von Humbolt and Tingo Maria) have been established, with good results (ITTO 2006). However, these trials have not yet been expanded to an operational scale. Reforestation concessions have been created to promote planted forests in the Amazon using valuable species. Numerous such concessions have been registered but, to date, the associated regulations have not been put in place.

Forest certification. The Government of Peru promotes voluntary forest management certification as a tool for SFM.[a] Since 2004, a national working group on forest certification coordinated by WWF Peru has been working on the establishment of an FSC-accredited system for voluntary certification. According to Kometter (2010), a total area of 713 380 hectares was certified as of early 2010, including 15 forest concessions covering 458 600 hectares and 16 community forest areas.[a] Combined, three export-oriented forest enterprises (Aserradero Espinoza, Empresa Forestal Venao, and A&A Perú) have 256 100 hectares of certified forest. Twelve native communities have a group certificate over a total area of 150 700 hectares (ibid.). The certified area has increased more than tenfold since 2005.

Table 4 Commonly harvested species for industrial roundwood

Species	Notes*
Eucalyptus globulus (eucalipto)	258 000 m^3; from planted forests in Andean valleys.
Virola spp (cumala)**	218 000 m^3; from low-lying and low hill Amazon forests.
Cedrelinga catenaeformis (tornillo)**	173 300 m^3; from low hill Amazon forests.
Chorisia intregrifolia (lupuna)	147 100 m^3; from terrace and low hill Amazon forests.
Cedrela odorata (cedro)**	127 000 m^3; from inundated and low hill Amazon forests.

* *Volumes are average sawnwood production for the period 1991–2008.*

** *Also listed in ITTO (2006).*

Source: Kometter (2010).

Estimate of the area of forest sustainably managed for production. Since 2005, regulated concession management in the Peruvian Amazon has been launched. All active concessions must have a forest management plan and are closely monitored. Nevertheless, it is too early to assess the effect of this new system on SFM. Table 5 shows the estimated sustainably managed production forest in Peru comprising the FSC-certified forest area and the 890 000 hectares under Brazil nut concession (Kometter 2010).

Timber production and trade. There has been a steady increase in log production in Peru in recent years, from 1.29 million m^3 in 2003 to 2.37 million m^3 in 2009 (ITTO 2010). Sawnwood production in 2009 was 1.12 million m^3, more than double that in 2003. The export of logs is not permitted but about 40% (480 000 m^3) of sawnwood production is exported (ibid.). The maximum sustainable harvest under a 40-year polycyclic system is estimated to be in the range 25–40 m^3 per hectare (ITTO 2006); current off-take would appear to be well below that. There are about 250 sawmills in Peru, most of which have a small installed capacity (averaging 2900 m^3 per year). Only about 25% of sawmills have band-saws and a capacity of 10 000 m^3 per year or more (ibid.). The export value of timber products increased from US$66 million in 2000 to US$191 million in 2008 (WWF Peru 2009).

Non-timber forest products. The use of NTFPs is widespread in Peru. Over 130 products have been identified in the Amazon for local consumption and national and international trade. Tara (obtained from *Caesalpinia spinosa*) is the basis of a growing industry in Peru. It is an excellent source of environmentally friendly tannins (tara tannins). It is used as a hydrocolloid thickener and gelling agent and has application in frozen desserts, instant soups, cream cheese, baked goods and other products.

Logs at the Port of Pucallpa, Peru.

Brazil nut is another important NTFP produced for export in Amazon forests, with an annual production of more than 1 million kg. Extracts of *Lonchocarpus nicou* (barbasco) are exported as a vegetative insecticide.

The production of palm hearts (palmito, 200 000 kg per year) is also important. Medicinal plants, such as cat's claw (*Uncaria tomentosa* – uña de gato, 500 000 kg per year), and sangre de grado (*Croton lechleri*), are increasingly popular.[a]

Forest carbon. Gibbs et al. (2007) estimated the forest biomass carbon stock in the range 7690–11 520 MtC and FAO (2010a) estimated it at 8560 MtC. Land use, land-use change and forestry contribute about 60% (110 000 gigagrams of CO_2e) of Peru's annual GHG emissions.

MINAM is responsible for REDD+ and coordinates the National Commission on Climate Change. A multi-stakeholder REDD Group (*Mesa REDD*) was formed in 2008 to support MINAM in the further development of REDD+ in Peru (Government of Peru 2010).

Table 5 Management of the production PFE ('000 hectares)

Reporting year	Natural					Planted		
	Total	Available for harvesting	With management plans	Certified	Sustainably managed	Total	With management plans	Certified
2005*	24 600	8000	5000	59	560	200–300	8	0
2010	**18 700****	**8431**	**7563‡**	**713**	**1603**	**820**	**-**	**0**

* *As reported in ITTO (2006).*

** *Potential timber concession areas as classified by law (Government of Peru 2010).*

‡ *Only timber concessions (*unidades de manejo forestal *and community concessions) valid as of end 2009 counted here.*

Peru is a participant in the Forest Carbon Partnership Facility, and its REDD readiness preparation proposal was approved in March 2011. Peru is a recipient country of the Forest Investment Program, and it benefits from bilateral support programs in REDD+ in the Amazon region. Several REDD+ pilot projects are under way in the country's forested regions. The proportion of intact forests with crown cover greater than 60% is high (81% of the total forest area). There is also considerable potential to enhance carbon stocks through forest restoration and reforestation in deforested landscapes. Table 6 summarizes Peru's forest carbon potential.

Forest for protection

Soil and water. Soil and watershed conservation are of considerable importance in Peru, particularly in the Andes. The National Program for the Management of Water Catchments and Soil Conservation (*Programa Nacional de Manejo de Cuencas Hídrograficas y de Conservación de Suelos*), which is implemented by *Agrorural*, is conducting the country's most extensive forestry program with the aim of applying participatory approaches to soil and water conservation based on reforestation. In 2008, a legislative decree (Decree 1081) was enacted to create the National System for Water Resources (*Sistema Nacional de Recursos Hídricos*), which emphasizes the protection and restoration of watersheds. A total of 389 000 hectares of forest is classified as exclusively for soil and water protection. In addition, in 2007 an area of about 367 000 hectares was reforested for the single purpose of protecting destabilized watersheds.[a]

Biological diversity. Peru has a great range of geographical conditions and is very biodiverse. It contains 10% of the global total of flowering plant species (40 000–50 000 plant species), 462 mammals, 1816 birds, 360 reptiles, 332 amphibians, 2000 sea fish and 797 freshwater fish (ITTO 2006). Thirty-seven mammals, 61 birds, 77 amphibians, two reptiles and seven plants found in forests are listed as critically endangered, endangered or vulnerable on the IUCN red list of threatened species (IUCN 2011). Eight plants are listed in CITES Appendix I, 363, including caoba, are listed in Appendix II, and three (including cedro) are listed in Appendix III (UNEP-WCMC 2011).

Protective measures in production forests. Management-plan prescriptions for forest concessions give clear and detailed instructions on leaving protection strips along streams, and they specify species to be protected and refer to wildlife protection in concession areas. There are also prescriptions for reduced impact logging and related measures.[a] Tree species that are officially excluded from commercial harvesting are palo de ora, romerillo, cedro de altura and nogal.[a]

Extent of protected areas. In 2001, new natural protected areas were defined and existing protected areas were reclassified. The well-developed and relatively well-funded system of protected areas, SINANPE, now contains 61 protected areas covering an area of 18.5 million hectares, or 15% of the country. Protected areas include national parks, national reserves, national sanctuaries and other zones (Box 3). SINANPE is complemented by regional conservation areas (*areas de conservación regionales* – ACRs). Recently there has been a move to encourage the creation of ACRs by regional governments: Presidential Resolution 205-2010-SERNANP (dated 26 October 2010) is designed to stimulate the creation of ACRs through regional governments that are also financing such areas. Three ACRs have been created: Choquequirao, Bosque de Puya Raimondi-Titankayocc and Ampiyacu–Apayacu.

A large part of the protected-area network is heavily forested. An estimated 13.7 million hectares of forested land are classified under IUCN protected area categories I–IV.[a] Many protected areas are

Table 6 Forest carbon potential

Biomass forest carbon (MtC)	% forest with canopy cover >60%	Deforestation/ degradation potential to 2030	Enhancement of carbon sink capacity to 2030	Forest area change monitoring capacity	Forest/ GHG inventory capacity	Importance of forest fire/ biomass burning	Engagement in international REDD+ processes
7690–11 520	81	+++	++	++	+	++	+++

+++ high; ++ medium; + low; estimate of national forest carbon based on Gibbs et al. (2007); estimate of % total forest with canopy cover >60% based on UNEP-WCMC (2010).

Box 3 Categories of protected areas

Category	Number	Area (ha)
National parks	12	7 967 119
National reserves	13	3 719 347
National sanctuaries	9	317 366
Historical sanctuaries	4	41 279
Landscape reserves	2	711 818
Protection forests	6	389 987
Communal reserves	8	1 777 466
Reserved zones	9	3 396 364
Hunting reserves	2	124 735
Wildlife refuges	2	8 591
Small islands		140 833
Total SINANPE	67	18 594 909
Regional conservation areas	5	695 227
Private conservation areas	20	124 991
TOTAL	**92**	**19 415 127**

Source: Kometter (2010).

under pressure, however, including from conversion to other land uses (particularly shifting cultivation but also monoculture agriculture and illegal crops such as coca), small-scale and large-scale timber theft, illegal mining, oil and gas exploration, and illegal hunting and fishing.

In 2001 INRENA granted an area of 135 832 hectares as a 'conservation concession' for a period of 40 years to a private association (the Amazon Watershed Conservation Association – *Asociación para la Conservación de la Cuenca Amazónica*). In 2010 a total of 423 000 hectares were under such concessions and another 55 000 hectares were under ecotourism concessions. These areas are not counted as part of the protected-area network. In such concessions, protection activities, ecotourism and the sustainable use of NTFPs may be carried out, but not logging. It is expected that more concessions will be granted in the future for NTFPs and conservation.

Estimate of the area of forest sustainably managed for protection. Large areas of the protection PFE are under no imminent threat due to their remoteness but are not counted here as under SFM. A total area of about 11.6 million hectares of protected area is clearly defined and is covered by some sort of management planning.[a] The area of protection PFE managed sustainably is estimated at 1.88 million hectares (Table 7). This includes the core water protection forests of about 60 000 hectares and the totally protected portion of the Peruvian part of the transboundary protected areas of Tambopata (1.09 million hectares) and El Condor (253 000 hectares), both of which have been supported by ITTO and other international donors, plus the areas under conservation and ecotourism concessions.

Socioeconomic aspects

Economic aspects. The contribution of the forest sector to GDP is about 1.02% of a total GDP of US$1.03 trillion.[a] An estimated 250 000 jobs are generated directly by forestry activities, over 50% of them in the Peruvian Amazon (ITTO 2006). The forest industry, including many small and medium-sized enterprises, are mostly located in Lima, Trujillo, Chiclayo, Cuzco, Iquitos, Pucallpa and Tarapoto and employ more than 82 000 people (ibid.). The contribution of forestry, however, is not only made through direct employment but also through the provision of a wide range of goods for consumption, handicrafts and small commerce. Fuelwood collection is still the main extractive use of the country's forests, in particular in forest-poor mountain areas. Small-scale logging is important both economically and socially in the Amazon, and nearly all forest areas close to the main rivers have been heavily harvested.

Livelihood values. Many NTFPs are used and traded locally, such as fruits and vegetables like aguaje (*Mauritia flexuosa*), camu-camu and palmito, local bamboo (*Guadua angustifolia*), palms and

Table 7 Management of the protection PFE ('000 hectares)

Reporting year	Protection PFE	Forests attributed to IUCN categories I–IV	Allocated for soil and water	With management plans	Sustainably managed
2005*	16 300	3130	390	-	1540
2010	**19 400**	**3404****	**389**	**11 600**	**1880**

* *As reported in ITTO (2006).*

** *According to UNEP-WCMC (2010).*

fibres. Wildlife, particularly fish, is an important source of protein throughout the Amazon.

Social relations. The Peruvian Amazon remains a frontier for settlers from other parts of Peru, many of whom engage in small-scale agriculture and the gathering of forest products, often illegally. Poaching, the illegal harvesting of valuable timber species and illegal mining are all widespread.[a] Narcotic crops, particularly coca, are planted by shifting cultivators in fields and small openings in the forests. The social impacts of the new concession system are unknown. Logging by outsiders of Indigenous and community lands can cause intra-community conflicts, including over the distribution of payments.

More than 1354 Indigenous communities (*comunidades nativas*) are known to make their living in the Peruvian Amazon, occupying about 14.95 million hectares or 17% of the total area of the Peruvian Amazon. Their livelihoods are closely interlinked with forests. An estimated 13.5 million hectares of potentially productive forests are in areas claimed by Indigenous peoples and about 1.75 million hectares are situated within Indigenous reserves. About 100 timber licences are located in the immediate vicinity of Indigenous territories (G. de Freitas, pers. comm., 2009). While new forms of collaboration and benefit-sharing are being established between concession-holders and local people, the new situation is also prone to misunderstanding and conflict. Although REDD+ is developing rapidly in Peru, many local and Indigenous people see it as a threat. Considerable efforts are needed to clarify REDD+ and related forest issues with local stakeholders.

Summary

The forest sector of Peru has been undergoing rapid change. After signing the Trade Promotion Agreement with the United States in 2007, the Government of Peru embarked on a new process to reform the forest policy and law as well as to restructure and decentralize the system of forest administration and governance. This was done on a fast track through a series of supreme decrees, including the issuance of a new forest law, decentralization efforts and new central institutions. However, the outcome was highly controversial and led to a prolonged period of protest by civil society and Indigenous peoples. Nevertheless, Peru has taken significant steps towards integrating the forest sector into the broader macroeconomic objectives of sustainable development and has put in place a system of control that allows further progress in SFM. An independent forest-control mechanism has been established and a broad coalition of stakeholders from the public and private sectors and civil society works together to develop the forest agenda. The Government of Peru is engaged in the development of REDD+ with a nested approach and in a broad stakeholder dialogue to develop REDD+ as a major instrument for forest-based development in the Amazon. Peru still faces some major challenges in enforcing and applying regulations and planning instruments in the country's vast Amazon forests and in guaranteeing the rights of Indigenous and local people.

Key points

- Peru has an estimated PFE of 38.9 million hectares (compared with 41.1 million hectares in 2005), comprising 18.7 million hectares of natural production forest (compared with 24.6 million hectares in 2005), 19.4 million hectares of protection forest (compared with 16.3 million hectares in 2005) and 820 000 hectares of planted forest (compared with 200–300 000 hectares in 2005).
- An estimated 1.60 million hectares of the production PFE is under SFM. About 713 000 hectares of natural production forest is certified (compared with 59 000 hectares in 2005). An estimated 1.88 million hectares of protection PFE is under SFM. Large areas of the protection PFE, even if not formally under SFM, are under no imminent threat due to their remoteness.
- The rate of deforestation has declined. The country has an ambitious plan to reduce deforestation to zero by 2020 and has put in place programs (e.g. the National Forest Conservation Program) for this purpose.
- A broad consultation process on the preparation of a new forest law and policy is under way and new institutions have been created to manage forests on the principles of SFM.
- Despite the difficult macro-economic situation for the timber trade, Peru has increased its exports of hardwood timber and further developed its domestic timber industry.

Nevertheless, most exports are in the form of sawnwood and there has been only limited development of further-processing in Peru.

- There is considerable potential for REDD+ in Peru. However, many local and Indigenous people see it as a threat, and considerable efforts are needed to clarify REDD+ and related forest issues with local stakeholders.

Endnote

a Government of Peru (2009).

References and other sources

FAO (2010a). Global forest resources assessment 2010 country report: Peru (available at http://www.fao.org/forestry/fra/67090/en//).

FAO (2010b). *Global Forest Resources Assessment 2010 Full Report.* FAO, Rome, Italy.

FSC (2010, website accessed September 2010). FSC certification database (searchable database available at http://info.fsc.org/PublicCertificateSearch).

Gibbs, H., Brown, S., Niles, J. & Foley, J. (2007). Monitoring and estimating tropical forest carbon stocks: making REDD a reality. *Environmental Research Letters* 2 (available at http://iopscience.iop.org/1748-9326/2/4/045023/fulltext).

Government of Peru (2008). Second national communication to the UNFCCC. National Environmental Council of Peru, Lima, Peru (available at http://www.adaptationlearning.net/projects/peru-second-national-communication).

Government of Peru (2009). Informe sobre el Progreso del Peru den Alcanzar la gestión forestal sostenible y el Objective 2000 de la OIMT (periodo de evaluación: 2002–2008). Ministerio de Agricultura, Dirección General Forestal y de Fauna Silvestre, Lima, Peru.

Government of Peru (2010). Peru readiness preparation proposal. Submitted to the Forest Carbon Partnership Facility, September 2010. (available at http://www.forestcarbonpartnership.org/fcp/node/257).

ITTO (2006). *Status of Tropical Forest Management 2005*. ITTO, Yokohama, Japan (available at http://www.itto.int/en/sfm/).

ITTO (2010, website accessed December 2010). Annual Review statistics database (available at http://www.itto.int/annual_review_output/?mode=searchdata).

ITTO & RRI (2009). Tropical forest tenure assessment. trends, challenges and opportunities. ITTO, Yokohama, Japan and Rights and Resources Initiative, Washington, DC, United States.

IUCN (2011, website accessed April 2011). IUCN red list of threatened species (searchable database available at www.redlist.org).

Kometter, R. (2010). Situación del sector forestal del Peru. WWF-Intercooperation internal paper.

Michell, T. & Hulme, M. (2000). A country-by-country analysis of past and future warming rates. Tyndall Centre for Climate Change research http://www.tyndall.ac.uk/sites/default/files/wp1.pdf

Spalding, M., Kainumu, M. & Collins, L. (2010). *World Atlas of Mangroves*. Earthscan, London, UK.

UNDP (2009). *Human Development Report 2009*. United Nations Development Programme, New York, United States.

UNEP-WCMC (2011, website accessed April 2011). UNEP-WCMC species database: CITES-listed species (searchable database at available at www.cites.org/eng/resources/species.html).

United Nations Population Division (2010, website accessed July 2010). World population prospects: the 2008 revision (searchable database available at http://esa.un.org/unpp/p2k0data.asp).

WWF (2009*).* Analysis of Current situation of forest concessions, forest sector reform and decentralization, and forest trade in Peru. WWF Peru Programme.