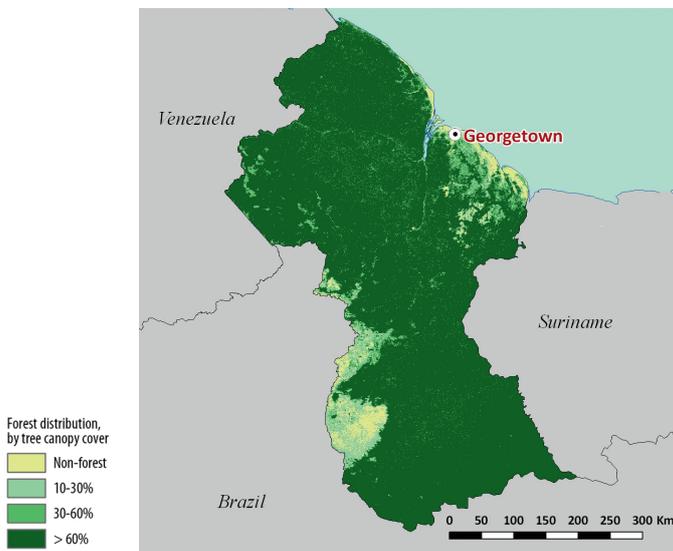


GUYANA



Forest resources

In 2010 the estimated population of Guyana was 761 000 people (United Nations Population Division 2010) and the country is ranked 114th out of 182 countries in UNDP's Human Development Index (UNDP 2009). It has a very humid climate and can be divided into four biogeographical zones: the narrow coastal plain; the 'rolling hills' – an extensive, forested area with sandy acid infertile soils reaching 90 m above sea level; a Precambrian lowland region of tropical rainforest; and, bordering Venezuela and Brazil, the Pakaraima mountains, a forested sandstone plateau 1000 m or more above sea level. FAO (2010) estimated that Guyana had 15.2 million hectares of natural forest in 2010, which is 71% of the total land area (21.5 million hectares). Guyana has an estimated 39 600 hectares of mangroves, the largest tracts of which are in the northern half of the country (Spalding et al. 2010).

Forest types. The Government of Guyana recognizes the following forest types: dry evergreen forest, marsh forest; montane forest; swamp forest mangrove forest; and mixed forest.^a The composition of the forest changes considerably from north to south and reflects varied topographic and geological conditions. Mixed forest is the most common type and the most important source of timber; common species include *Mora gonggrijpii* (morabukea), *Chlorocardium rodiei* (greenheart), *Vouacapoua macropetala* (sarabebeballi) and

Clathrotropis brachypetala (aromata). Seasonal forests have a lower canopy and include deciduous trees; they are found in the North Rupununi and upper Berbice areas. Dry evergreen forests occupy belts of leached white sands and are also found throughout the Pakaraima mountains (ITTO 2006).

Permanent forest estate. About 13.6 million hectares have been classified as state forest^a, although FAO (2010) estimated that the actual area of this estate is 12.2 million hectares. About 6.85 million hectares of state forest is allocated to commercial use and 1.11 million hectares to research and protection.^b The remaining state forest land, mainly in the south of the country, is unallocated; a lack of ready access and long distances to market make the commercial harvesting of these forests economically infeasible at present. Gazetted state forest is strictly allocated for production, harvesting, biodiversity and research and will not or is not converted in anyway to non-forested uses.^a Therefore, all state forest may be regarded as part of the PFE (Table 1).

Agricultural leases may be issued by the Guyana Lands and Surveys Commission for areas outside state forest. If an agricultural lease overlaps with areas within state forest the lessee must apply to the Guyana Forestry Commission (GFC) prior to any removal of timber.^b

Forest ecosystem health

Deforestation and forest degradation. Most of Guyana's forests are still intact, unexploited and not threatened by the expansion of agriculture, although more than half of the forest estate has been categorized as 'naturally regenerating' (Table 2). In its submission for this report the Government of Guyana did not report the area of forest affected by mining, slash-and-burn agriculture or fire.^a The total area of forest formally converted to agriculture to 2009 was 25 121 hectares. FAO (2010) estimated the deforestation rate in Guyana in the period 2005–10 at 0%. According to a recent study (GFC & Pöyry Forest Industry 2010), the deforestation rate for the period 1990–2009 was 0.02% per year, increasing to 0.06% in 2010.

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*	16.9	16 916	5450	12	980	6442
2010	15.2–20.5	13 600**	11 090‡	12^a	1110	12 212[†]

* As reported in ITTO (2006).

** Calculated using the ratio of forest with greater than 60% forest cover estimated by UNEP-WCMC (2010) (89.2%) and the total natural forest area estimated by FAO (2010).

‡ Includes that part of the Iwokrama forest allocated for production. Also includes 4.24 million hectares of state forest currently unallocated to either production or protection.

† Includes forest on Amerindian lands within the state forest estate but excludes forest on private property.

Table 2 Forest condition

	PFE	Non-PFE	Total
	'000 ha		
Area of primary forest	-	-	6790
Area of degraded primary forest	-	-	0
Area of secondary forest	-	-	8415*
Area of degraded forest land	-	-	0

* 'Other naturally regenerating forest'.

Source: FAO (2010).

Vulnerability of forests to climate change.

The mean annual temperature is projected to increase by 0.9–3.3 °C by the 2060s (McSweeney et al. undated). All climate-change projections indicate substantial increases in the frequency of days and nights that are considered hot in the current climate. This will affect forest growth and increase the vulnerability of forest ecosystems. Guyana's low-lying coastal plains are vulnerable to sea-level rises that may occur due to the effects of global warming (ibid.). In its submission to the UNFCCC, Guyana completed a vulnerability and adaptation assessment, the first step towards the formulation of a climate-change adaptation strategy for Guyana. The first draft of the Low Carbon Development Strategy was published in June 2009 and the third draft in May 2010, outlining a comprehensive approach to fostering Guyana's development while combating climate change (Office of the President 2010).

SFM policy framework

Forest tenure. The bulk of Guyana's forests is owned by the state (Table 3). Under the Forest Law and national forest policy, the ownership of all forest resources, except those on private property and Amerindian (Indigenous) Lands, are vested

in the state. About 1.31 million hectares of forest has been formally gazetted as Amerindian lands. State Lands, formerly called Crown Lands, are controlled by the Commissioner of Lands and Surveys. The GFC, the Guyana Geology and Mines Commission (GGMC) and the Lands and Surveys Department administer, respectively, land that is used for forestry, mining and agriculture. Each of these three government agencies may issue titles for different purposes over the same land (National Development Strategy Secretariat 2000).

Criteria and indicators. Guyana was a participant in the development of the Tarapoto C&I, which was coordinated by the Amazon Cooperation Treaty Organization. In 2001 the GFC reviewed both the Tarapoto and ITTO C&I in the development of a new national forest plan. The submission of the Government of Guyana to ITTO for this report was in the ITTO C&I reporting format.^a

Forest policy and legislation. The overall objective of Guyana's national forest policy, as set out in its 1997 National Forest Policy Statement, is "the conservation, protection, management and utilisation of the nation's forest resources, while ensuring that the productive capacity of the forests for both goods and services is maintained or enhanced".^a

Table 3 Forest area, by tenure

Ownership category	Total area	Of which PFE	Notes
	'000 ha		
State ownership (national, state or provincial government)	12 200	12 200	Managed by the GFC.
Other public entities (e.g. municipalities, villages)	0	-	
Total public	12 200	-	
Owned by local communities and/or Indigenous groups	1307	-	Gazetted Amerindian lands.
Privately owned by individuals, firms, other corporate	1676	-	Amerindian areas that have not been gazetted; agricultural leases; transported properties*; etc.
Total	2983	-	

* Privately owned. The owner of a transported property theoretically owns the land from the centre of the earth to the sky above subject to government interests (e.g. airplanes flying overhead, minerals, etc).

Source: ITTO estimate based on data in Government of Guyana (2009) and FAO (2010).

The specific objectives are to:

- Promote sustainable and efficient forest activities which utilize the broad range of forest resources and contribute to national development while allowing fair returns to local and foreign entrepreneurs and investors.
- Achieve improved sustainable forest resource yields while ensuring the conservation of ecosystems, biodiversity and the environment.
- Ensure watershed protection and rehabilitation by preventing and arresting the erosion of soils and the degradation of forests, grazing lands, soil and water; promoting natural regeneration, afforestation and reforestation; and protecting the forest against fire, pests and other hazards.

The policy was prepared over two years through a process of broad consultation with sector interest groups and was formally approved by Cabinet in October 1997. It recognizes that there have been changes in Guyana's economic, social and political environment over the nearly 50 years since the previous forest policy was published. It marks a significant shift in emphasis from the development of the timber resources to a broader approach to management for multiple goods and services for the national benefit.

The Forest Act – Chapter 67:01 of the Laws of Guyana – governed the administration of Guyana's forests from 1953 to January 2009, when the Parliament passed the Forest Bill (2009). As of October 2009, however, this Bill was still awaiting assent by the President of Guyana. When it comes into effect it will repeal Law 67:01 (and others) and is designed to “consolidate and amend the law

relating to forests”. Specifically, it sets out to provide for:

- The sustainable forest management of state forests.
- The protection and conservation of forests (excluding the Iwokrama forest, Kaieteur National Park, and any other area designated as a conservation area, all of which are dealt with under other laws).
- The regulation of forest operations and activities relating to forest produce and quality control for value-added forest produce, having regard to Guyana's international legal obligations.

Features of the Forest Bill (2009) include the following:

- Before granting or renewing any concession over an area of state forest 8097 hectares or smaller, the GFC shall
 - by public notice invite applications for a concession over the area and notify the locations where the relevant documents may be inspected or bought
 - provide any other publicity that the GFC considers necessary to bring the invitation to the attention of persons likely to be interested in obtaining a concession over the area.
- The GFC shall make available for inspection at its offices and for sale at a reasonable price copies of all documents in its possession concerning the forest produce and other features of the area that the GFC considers relevant to the preparation of applications.

- A consolidated effort towards maintaining environmental integrity and social development in communities by using relevant sections of both the Amerindian Act (2006) and the Environmental Protection Act (1996). Specific provisions are made for community forest management and extractive and primary processing forest operations.
- Recognition of the importance of ensuring sustainability in forest resource use. Part 2 of the Bill deals with SFM, recognizing that the minister has overall directive input on all activities.
- Forest concession agreements are streamlined with specific size classes. More importantly, the system for granting and renewing these agreements is systematic and transparent in keeping with international best practices.
- A proposal to make mandatory the submission of annual and management plans by larger concessions, and a further stipulation that all harvesting activities are to be carried out in compliance with approved plans.
- Allowance for competitive bidding in forest area allocation in the event of multiple applications, thereby improving transparency in the process.
- It provides communities with a clear means of acquiring and securing rights to manage forest areas and of benefiting from their local forest while ensuring sustainability, stimulating income generation and fostering environmental stability.
- It addresses areas such as afforestation, occupational health and safety, forest conservation, the maintenance of soil and water quality, and the preservation of biological diversity.
- It guards against pricing below the true market value. The GFC and the Forest Products and Marketing Council of Guyana (FPDMC) advise stakeholders on prevailing market prices.
- The clauses on forest offences and the appeals which may be made are also strengthened to reflect more severe penalties for abuse of power, negligence and misconduct.
- It allows for the more efficient and optimal use of Guyana's state forest resources by strengthening the revenue system. This is done

by creating a more efficient revenue structure which seeks to capture area management fees, fees for the standing stock of timber, an incentive to encourage SFM, and other related charges. The Bill provides for these monies to be paid over to the Consolidated and Contingencies Fund.

- It provides a robust mechanism for the authorization of state forest leases in cases of a change in ownership and effective control.

Institutions involved in forests. The GFC was created in 1979 under the GFC Act 67:02. In 2008 a new law, the GFC Act 2007, was passed by Parliament to “repeal and replace the Guyana Forestry Commission Act 1979, re-establish the Guyana Forestry Commission, and provide for incidental matters”. The GFC is a semi-autonomous public agency with the aim of encouraging the development and growth of forestry in Guyana on a sustainable basis. Among other things it advises the Minister of Agriculture on and carries out forest policy, and administers the Forests Act, including by carrying out the Commission's functions under that Act and collecting and recovering all fees, charges, levies, premiums, fines, penalties, costs, expenses, and other monies payable under the Act.

The GFC is also mandated to:

- Prepare plans, codes of practice and guidelines for the conservation and management of forests.
- Research, collate, analyse, prepare and disseminate data, statistics and other information about forests and all aspects of forestry, including forest ecology and the use of forest produce.
- Make forest inventories.
- Provide or facilitate education and training in forestry and forestry-related jobs.
- Provide forestry extension services and give advice to persons and communities interested or involved in forestry.
- Provide an inspection, certification and accreditation service for quality control of forest produce.
- Represent the Government in regional and international forestry meetings and negotiations, and in relation to Guyana's international obligations concerning forestry.

The GFC is a member of the Cabinet Sub-Committee on Natural Resources and Environment. This body, comprising policy and technical representatives, provides guidance and technical support to Cabinet. Its work is supported by the Natural Resources and Environment Advisory Committee, which is chaired by the Prime Minister and coordinated by the Adviser to the President on Sustainable Development. In 2010, 260 people were employed in public forest institutions, including 60 with university degrees or an equivalent qualification. Total public expenditure in the forest sector in 2010 was 500 million Guyanese dollars.^b

At the operational level, the GFC works in close collaboration with the FPDMC and the Forestry Training Centre. The Minister of Agriculture has established a Technical Committee comprising the GFC and the Forest Producers Association (FPA) and a Ministerial Committee comprising the GFC, the FPA and the Guyana Manufacturing and Services Association as part of efforts to foster a closer working relationship with the private sector and industry stakeholders. These fora allow open dialogue and act as problem-solving mechanisms for issues related to natural resource management, including in areas of harvesting, forest industry and export regulations.

One forest producers' association and a number of smaller, community-based loggers' associations represent loggers and sawmillers in the forest sector and endeavour to ensure collaboration in activities such as training, information, public awareness and institutional development. National environmental NGOs are weak, but international environmental organizations are assuming independent roles in forest control and information-sharing, partly in collaboration with the forest administration.

Status of forest management

Forest for production

The Forest Bill (2009) makes significant changes to the allocation of state forest for harvesting. Under the Bill, the GFC may grant forest concessions up to 8097 hectares in size for the harvesting of forest produce, including timber. Concessions may be larger on application by holders of

exploratory permits (see below) or if they are for 'forest conservation operations', which are defined by the Bill as the preservation of forests for the purpose of carbon sequestration or any other form of environmental service¹; the conservation of biological diversity; or ecotourism. Forest operations under these larger concessions can only be carried out after the GFC has approved a forest management plan of at least five years' duration and an annual operations plan for the concession area.

Exploratory permits may be granted under the Bill for exploratory operations within a specified area of state forest with a view to later applying for a concession in the area. The Bill does not state a limit on the size of the forest area that may be allocated under such permits. The Bill also specifies the parameters of community forest management agreements.

In its submission to ITTO, the Government of Guyana reported forest use on the basis of the Forest Act (1953), since the Forest Bill (2009) was yet to come into effect.^a Under the Forest Act, forest harvesting permits are allocated according to the following three categories:

- *Timber sales agreements* (TSAs): concessions are granted on a lease of 20 years or more over an area of 24 000 hectares or more. As of June 2010, 25 TSAs had been allocated to local and international companies covering an area of 4.53 million hectares (47.7% of all state forest).^a The average size of a TSA is 75 000 hectares (ranging from 50 000 to 100 000 hectares), and companies may hold more than one TSA at a time.
- *Wood cutting leases* (WCLs): licences are granted on 3–10-year leases for areas of 8000–24 281 hectares. As of June 2010, there were two licences covering a total area of about 30 500 hectares.^a
- *State forest permits* (SFPs): cutting permits are granted on an annual basis for areas of state forest up to 8094 hectares in size. SFPs are generally issued to small-scale operators; 386 permits covering a total area of 1.35 million hectares were allocated as of June 2010 (14.2%

¹ This provision is designed to allow conservation organizations to pay an amount equivalent to that which would have been paid for commercial harvesting rights for the exclusion of timber harvesting from particular forest areas.

of all commercial allocations).^{a,b} There are also permits called 'SFPs in conversion'.²

- *State forest exploratory permits*: before a WCL or a TSA is issued, a three-year exploratory permit may be granted to allow the collection of information for the preparation of an investment proposal, an environmental and social impact assessment, and a forest management plan. In June 2010, six exploratory permits covering an area of 797 000 hectares were in effect.^a

In 1998 the GFC introduced the Code of Practice for Timber Harvesting based on FAO's Model Code of Forest Practice. The Code, which was revised in 2002 (GFC 2002), prescribes internationally accepted standards for exclusion areas and buffer zones, 100% pre-harvest inventory, road construction, felling, skidding, trucking, operational and camp hygiene, and occupational health and safety. Besides exclusion areas and buffer zones, the Code restricts logging on slopes greater than 40% and sets a minimum distance of 10 m between harvest trees to minimize the size of canopy openings.

The Code of Practice for Timber Harvesting is not prescribed under the Forest Bill (2009). Instead, the Bill specifies that the GFC "may at any time submit to the Minister a proposed code of practice to regulate any class or description of forest operations". Such a code, if adopted by the minister, must then be adhered to during forest operations.

Guyana's forests are characterized by a predominance of relatively slow-growing, high-density timber species and smaller trees compared with most other tropical regions due to the inherently low fertility of soils derived from the ancient Guiana Shield. Commercial timber occurs in spatially segregated 'reefs' or stands in which one or two commercial species dominate. Nevertheless, a large proportion of the commercial stock in these stands is defective (hollow or crooked), possibly due to the poor nutrient status of the soils and a very low rate of natural disturbance (which

seems to have resulted in overmature stands), and commercially viable stands are usually separated by stands that are nearly devoid of commercial species. Forest harvesting is, therefore, highly selective; on average, 2–3 trees are felled per hectare, with an average yield of about 7 m³. The national forest plan guidelines prescribe a cut of up to 20 m³ per hectare on a 60-year cycle. Owing to the limited range of commonly used species, however, the extraction rate is only about half this maximum allowable cut.

Guyana has developed principles, policies and guidelines for improved forest management and timber harvesting practices. This is reflected in the 1997 national forest policy as well as in forest legislation, forest management guidelines and codes of practice. Among these guidelines are:

- Code of Practice for Timber Harvesting
- Guidelines for Conducting Management-level Inventory and 100%-level Inventory
- Guidelines for the Preparation of Forest Management Plans and Annual Operational Plans.

Prior to the approval of operations, large concessions (TSAs) are required to submit to the GFC a detailed management plan and annual operations plan. The latter specifies, among other things, the forest blocks to be harvested that year and the volume to be extracted. Volume is calculated based on area and felling cycle and tags are issued accordingly. Prior to the renewal of operations for the following year, harvested blocks are inspected by GFC field staff to ensure adherence to the annual operations plan.

Also stipulated in the management guidelines is the requirement that all large concessions allocate 4.5% of the total area to biodiversity conservation for the life of the concession. A number of criteria are set out for the selection and identification of this area:

- The area identified must be representative of the various vegetation types found in that concession and the area identified must represent all flora and fauna found in the concession.
- No harvesting may take place within this area once approved for biodiversity conservation.
- The GFC must conduct a reconnaissance survey to verify that the area selected is indeed

² These are areas exceeding 24 000 hectares that were previously issued as SFPs. These concessions are being regularized and some are being converted to the larger-sized category (TSAs) while others are being reduced to the smaller category (SFPs). The use of these areas is for sustainable production. The word 'conversion' therefore does not refer to land use but to a process of recategorization. These areas were not included in the figures provided for TSAs or SFPs.

representative of the vegetation type(s) found in the concession.

- The GFC must give official approval for this area to be allocated to biodiversity conservation.

A national log-tracking system was established in 1999 and is based on international best practice to ensure transparency.^a It works on the ground through the GFC's 26 forest stations, enabling a forest officer to track timber from the stump. Harvesting can therefore be monitored to ensure that the requirements established in the approval of management plans and annual operation plans are met. The system, further developed in recent years with ITTO assistance, reduces the risk of over-harvesting within a concession and helps ensure that harvesting is carried out only in those areas identified and approved by the GFC for harvesting.

The log-tracking system functions via the use of log tags which are assigned (free of charge) to operators at the annual renewal of their licences. Each operator is given a unique set of tags, which are valid only for a period determined by the GFC (two years for SFPs and one year for large concessions). Half of the tag is affixed to the stump at the time of felling and the other half, which bears the same sequence of numbers, is affixed to the produce being conveyed. All timber is tagged, including logs, lumber, piles, poles and posts.

The system is currently applied to all forestry operations in state forests and on Amerindian reservations and private properties. All timber legally originating in Guyana can therefore be traced back to the stump. A bar-code system is under development. This system of log-tagging appears to have been accepted by the industry and has increased the capability of the GFC to monitor timber transactions.

Reduced impact logging techniques are promoted by the ITTO-funded Forestry Training Centre, Inc, a subsidiary of the GFC, through demonstration forests and hands-on training. To October 2009 the Forestry Training Centre had provided training for 1036 persons from academic institutions, forest administration, NGOs, logging enterprises and communities. This figure includes 345 persons from community-level operations, largely in Indigenous communities, who received training in 2010.^b

The Iwokrama International Centre for Rainforest Conservation and Development (known as the Iwokrama forest) is responsible for the management, conservation and sustainable development of almost 372 000 hectares of tropical rainforest, which the government of Guyana allocated as a way of demonstrating that tropical forests can provide economic benefits while also conserving biodiversity. Its operation has been supported by a range of donors, including ITTO.

The GFC is coordinating a program of work on forest law enforcement and legality with the support of the Forest Products Development and Marketing Council, the Forestry Training Centre Inc., and private-sector counterparts. One of the outputs of this process has been the development of the Guyana Legality Assurance System (LAS) through a process of stakeholder consultation and participation. In June 2006, Proforest (an international firm specializing in forest legality systems) was contracted to assist in the development and field-testing of an independent, transparent and suitable timber legality verification system for Guyana's forest sector. The LAS complements other efforts towards ensuring legality, such as ongoing concession-level monitoring, the national log-tagging and tracking system, and the implementation of the Code of Practice for Timber Harvesting.

A memorandum of understanding between the Government of Guyana and the Government of Norway outlines a number of activities to be undertaken in 2009–10, including the establishment of a system for independent forest monitoring (IFM). This will build on work already under way in Guyana and will allow for the development of a mechanism for assessing illegality in the forest sector. It will cover all significant drivers of deforestation and forest degradation in Guyana and thus has direct links to a REDD+ monitoring program. The IFM is not intended to replace the LAS, ongoing dialogue with the European Union's Forest Law Enforcement, Governance and Trade initiative, or existing legality procedures/systems. Instead, it will serve as a national system of legality assessment at the broader country level, addressing relevant drivers of forest change that are linked to forest legality/illegality and providing a system that can be recognized globally. The IFM will be implemented in state forests and Amerindian villages that opt into the

country's Low Carbon Development Strategy. It will be applied to logs (roundwood, piles, poles and posts) and lumber. It will cover all stages of the chain of custody – harvesting, transportation, processing and export. The initial activity in late 2010 was to be a scoping mission. The GFC will implement recommendations over a one-year period. Thereafter, monitoring assessments will be conducted at two-year intervals (or less).

Silviculture and species selection. The default silvicultural system in use in Guyana is natural regeneration with polycyclic cuts, without post-harvest silvicultural interventions. Under the Forest Act (1953), yield is regulated by a minimum diameter limit of 34 cm, while forest management plans for WCLs and TSAs must specify the cutting cycle and yield per cutting cycle; they must also indicate species for harvesting and harvesting rules. The Forest Bill (2009) does not specify a minimum diameter limit.

There are more than 1000 tree species in Guyanese forests, more than 30 of which are marketed and exported to destinations in Asia, Europe, North America and the Caribbean (Table 4 shows five of these). *Chlorocardium rodiei* (greenheart), *Peltogyne venosa* (purpleheart), *Eperua* spp (wallaba) and *Hymenaea courbaril* (locust) are some of the species most favoured by international markets. In the Iwokrama forest, the second most abundant species after greenheart is *Dicorynia guianensis* (wamaradan, also known as Angelique in French Guiana) (K. Rodney, pers. comm., 2011).

Greenheart is resistant to attack by marine borers and is highly valued, especially as piling for wharves and for other marine applications. The 'special' category of timber, which includes greenheart, purpleheart, bulletwood, red cedar, brown silverballi and letterwood, accounted for about 35% of total log production in 2009.^b The production of piles and chainsaw lumber is not included in these figures. Other important species are *Goupia glabra* (kabukalli), *Trattinickia* spp (ulu), *Pouteria speciosa* (suya), *Aspidosperma* spp (shibadan), *Simarouba amara* (marupa), *Carapa guianensis* (crabwood) and *Catostemma commune* (baromalli).

Planted forest and trees outside the forest. About 12 000 hectares of planted forest, mainly *Pinus caribaea*, were established in the 1960s. They were originally intended to supply a pulp industry but are now maintained as permanent sample plots

under the management of the GFC.^b No new planted forests are being established.^b FAO (2010) reported that there were no planted forests in Guyana.

Forest certification. ITTO (2006) reported that two concessionaires were engaged in the process of obtaining forest-management and chain-of-custody certification under the FSC, while two more had shown an interest in pursuing certification. Currently, however, there is only one certified forest area – the Iwokrama forest (372 000 hectares, including 184 500 of production forests in the 'sustainable utilization area', FSC 2010).³ The estimated sustainable yield in Iwokrama's sustainable utilization area is about 22 000 m³ per year (Iwokrama International Centre for Rain Forest Research and Development 2009).

Estimate of the area of forest sustainably managed for production. Table 5 shows that the total size of the production PFE and the area allocated to concessions or otherwise under licence have both increased compared with 2005. Guyana is making good progress towards SFM and the log-tracking system has added transparency to the system. The Government of Guyana^b reported that "all concession harvesting activities are managed in keeping with sustainable forest management principles ... There is overall compliance with GFC principles and management practices across issued concessions. GFC has 26 field stations as well as mobile stations that monitor forest operations. Additionally, routine monitoring and environmental audits are conducted to test compliance with set principles and practices. These have overall indicated positive results and compliance." On the basis of an estimate provided by the Government of Guyana, FAO (2010) reported that the entire state forest estate (12.2 million hectares) was under sustainable management.

In 2005, two concessionaires were working towards the certification of their forests under the FSC scheme. Several companies have since had some experience with certification (K. Rodney, pers. comm., July 2010):

- Barama Co. Ltd., a wholly-owned subsidiary of Samling Global Limited with concessions

³ The Iwokrama forest was the second Guyanese forest to be certified. The Barama concession was the first, but lost its certificate following an FSC audit (K. Rodney, pers. comm., 2011).

Table 4 Commonly harvested species for industrial roundwood

Species	Notes
<i>Peltogyne venosa</i> (purpleheart)	Used mainly in high-end internal construction applications and for furniture and components.
<i>Chlorocardium rodiei</i> (greenheart)*	Used mainly for outdoor structural applications and marine works.
<i>Swartzia leiocalycina</i> (wamara)	Used mainly for furniture, and components.
<i>Mora excelsa</i> (mora)*	Used mainly for building construction, especially flooring.
<i>Goupia glabra</i> (kabukalli)	Used mainly for heavy construction, house framing, flooring and decking.

* Also listed in ITTO (2006).

Source: Government of Guyana (2009).

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*	5450	3800	3730	0	520	12	0	0
2010	11 090	6710**^a	4053^a	184.5	520	12	0	0

* As reported in ITTO (2006).

** Existing TSAs, WCLs and SFPs.

covering about 1.6 million hectares of forest (Barama 2010), had certification, but this has lapsed.

- Demerara Timbers Ltd (DTL) has a chain-of-custody certificate in compliance with a UK government standard.
- Variety Woods & Greenheart Limited has sought FSC certification but it is unclear how far it has progressed.
- Toolsie Persaud Ltd underwent a pre-assessment audit with The Forest Trust.
- Iwokrama's joint venture partner (Tigerwood Guyana Inc) has an FSC chain-of-custody certificate.

Although Iwokrama is the only operation in Guyana with an FSC forest-management certificate, the strong field presence of the GFC, moves by several companies towards certification, and the development of a trained cadre of forest operators suggests that a significant area of the Guyana's forest is being managed in a way that is consistent with sustainability. At the very least it seems unlikely that the area under such management has declined since the previous report.

Timber production and trade. Total industrial log production was 299 000 m³ in 2009, down from 474 000 m³ in 2006 and 366 000 in 2004 (ITTO 2011). About 64 000 m³ of sawnwood were

produced in 2009, an increase over the 56 000 m³ produced in 2004 and the 50 000 m³ produced in 1999. Plywood production, on the other hand, declined from 87 000 m³ in 1999 to 54 000 m³ in 2004 and to 21 000 m³ in 2009 (ibid.).

The total export value of logs, sawnwood and plywood in 2009 was US\$48.1 million, compared with US\$38.3 million in 2004 and US\$31.3 million in 1999 (ibid.). In 2009, Guyana exported 91 000 m³ of logs, 49 000 m³ of sawnwood and 17 000 m³ of plywood (ibid.).

In January 2009 the Government of Guyana introduced a national log export policy that increased the export commission rate on key species used locally in value-added production. The policy was in response to the perceived need among various stakeholders to stimulate more value-added activities in Guyana, to increase the use of lesser-used species, and to ensure that domestic downstream processors of logs receive adequate supplies of materials. The policy has three elements:

- Raise the export commission rate from 2% to 7% from January 2009, to 10% from January 2010, and to 12% in the period January–December 2011, for logs of the following species: purpleheart, *Cedrela fissilis*, *C. odorata* (red cedar), *Piratinera guianensis* (letterwood), *Manilkara bidentata* (bulletwood), *Bagassa guianensis* (cow wood), *Diploptropis purpurea*

(tatabu), kabukalli, shibadan, *Humiria balsamifera* (tauroniro), *Tabebuia serratifolia* (washiba), *Loxopterygium sagotii* (hububalli), *Dipteryx odorata* (tonka bean), *Hymenolobium flavum* (darina), greenheart and *Licaria canella* (brown silverballi).

- Raise the export commission rate from 2% to 7% in January 2009 and to 10% in the period January 2010 to December 2011 for logs of the following species: *Swartzia benthamiana* (itikiboroballi), *Ocotea rubra* (determa), wamara, *Tabebuia capitata* or *insignis* (hakia), mora, *Parahancornia fasciculata* (dukali), *Ocotea puberula* (keriti silverballi), wallaba, *Terminalia amazonica* (fukadi) and *Jacaranda copaia* (futui).
- Impose the same export commission rates as specified in the first part of the policy to the export of squares with dimensions of 20.3 cm x 20.3 cm and greater (or 8" x 8" and greater) to the following species: purpleheart, red cedar, letterwood, kabukalli, shibadan, washiba, hububalli and tonka bean.^a

Only companies holding forest concessions are permitted to export logs. The log export policy is expected to induce a reduction in the volume of wood exported in log form and as squares.

Non-timber forest products. Many NTFPs are harvested from natural forests but only a few are extracted commercially. Significant volumes of *Euterpe oleracea* (palm heart, manicole) are exported in canned form; in 2008 about 2.7 million palm hearts were harvested in Guyanan forests, up from 2.48 million in 2007.^b Nibi and kufa (rattan-like *Heteropsis flexuosa* and *Clusia* spp) are used for furniture-making and exported to the Caribbean islands, the United Kingdom and North America. Fibres of *Mauritia flexuosa* (ité palm) are used to make baskets, mats and other items for export. Other products include latex from *Manilkara bidentata* (balata), *Bixa orellana* (annatto dye) and *Carapa guianensis* (crabwood oil). Mangrove bark is

exported for tanning leather. There is a legal trade in wildlife, especially birds, reptiles and amphibians.

Forest carbon. Gibbs et al. (2007) estimated Guyana's forest carbon at 2490–3740 MtC and FAO (2010) estimated it at 1629 MtC. Since 2000, GHG emissions from deforestation are estimated to have averaged about 22.6 million tonnes of CO₂e per year (Government of Guyana 2008). In preparing its REDD+ strategy the Government of Guyana engaged with the Forest Carbon Partnership Facility and UN-REDD, and it is an active member of the REDD+ Partnership. On 9 November 2009 the governments of Guyana and Norway signed a memorandum of understanding that sets out how the two countries will “work together to provide the world with a relevant, replicable model for how REDD+ can align the development objectives of forest countries with the world's need to combat climate change”. Norway committed to providing financial support of up to US\$250 million by 2015 for results achieved by Guyana in limiting emissions from deforestation and forest degradation under its Low Carbon Development Strategy (Office of the President 2010). This strategy sets out Guyana's approach to transition to a green economy, with the stated aim of combating climate change while simultaneously promoting economic growth and development. It sets out how Guyana's economy can be realigned along a low-carbon development path by investing payments received for avoided deforestation into strategic low-carbon sectors (Government of Guyana 2011). The increase in deforestation reported in 2010 may be due partly to an expectation of tighter controls under this strategy.

Guyana has also established a National Climate Committee comprising representatives of a number of government agencies, NGOs and the private sector. This committee has a reporting responsibility to the Government and the Parliament of Guyana. The National Climate Unit within the Ministry of Agriculture is the implementing entity for the

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
2490–3740	89.2	+	+++	+++	++	+	+++

+++ 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).

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

Reporting year	Protection PFE	Attributed to IUCN categories I-IV	Allocated for soil and water	With management plans	Sustainably managed
2005*	980	980	-	243	243
2010	1110	1040	-	332**	332**

* As reported in ITTO (2006).

** Comprises Conservation International's conservation concession (which, strictly speaking, is part of the production PFE but is not counted there), the protected portion of the Iwokrama forest, and Kaieteur National Park.

committee and manages and coordinates day-to-day climate-change procedures. Guyana has also established an Office for Climate Change and a REDD+ Secretariat to execute aspects of climate-related activities and REDD+. Table 6 summarizes Guyana's carbon potential.

Forest for protection

Soil and water. Forests are still intact over large areas. There are, however, threats to biodiversity and to soil and water, of which mining – particularly for gold – may be the greatest. Small-scale gold-mining takes place over a wide area; impacts include localized deforestation, the removal of topsoil and the pollution of watercourses with sediment and mercury. Trees felled by gold-miners cause blockages to rivers, sometimes resulting in downstream flooding. Guyanese soils are essentially alluvial; they are acidic, with a pH as low as 3.6, and quickly degenerate once trees are removed (Clarke 2006).

Biological diversity. Guyana's large areas of intact forest ecosystems have a very high conservation and ecological value. More than 1200 vertebrate species were counted in a 1997 inventory, including 198 mammals, 728 birds, 137 reptiles and 105 amphibians, and more than 6000 flowering plant species, of which about one hundred are forest trees of commercial interest. It is almost certain that many more species remain to be discovered. No species found in Guyana's forests are listed on the IUCN red list of threatened species (IUCN 2011). Guyana has two plant species listed in CITES Appendix I, 42 in Appendix II and one in Appendix III (UNEP-WCMC 2011). Bulletwood is protected under the Forest Act for its value to Indigenous communities and because of the limited occurrence of this species in Guyanan forests.

Protective measures in production forests. The Code of Practice for Timber Harvesting includes provisions for protecting watercourses, reducing the impact of logging on residual stands and conserving protected wildlife. Forest management plans must

identify representative biodiversity reserves covering at least 4.5% of the productive forest area that are then excluded from harvesting. The GFC's monitoring division monitors TSAs against the standards prescribed by the Code.

Extent of protected areas. Guyana has two formally established protected areas in forests (both of which are established under separate laws): the Kaieteur National Park, which is 63 000 hectares in size, and the Iwokrama forest, of which 187 500 hectares are set aside for forest conservation purposes. Under the proposed National Protected Areas System, more areas could be allocated for protection, including Shell Beach (which includes mangrove forests), Kanuku Mountains, Mount Roraima, and Orinduik Falls.⁴ In 2002 Conservation International was awarded a 30-year conservation concession of 81 000 hectares to the south of Iwokrama called the Upper Essequibo Conservation Concession.⁵ There are also eleven 'GFC reserves' covering a total area of 17 800 hectares. UNEP-WCMC (2010) estimated that there were 1.04 million hectares of forest in IUCN protected-area categories I-IV.

Estimate of the area of forest sustainably managed for protection. The estimated area of protection PFE under sustainable management is at least 331 500 hectares (Table 7). This area comprises the Kaieteur National Park, Conservation International's conservation concession, and the conservation area set aside in the Iwokrama forest. The area under sustainable management has increased since 2005, due mainly to the addition of CI's conservation concession but also to a slight amendment in the size of Iwokrama's conservation area.

4 www.guianashield.org/joomla/index.php?option=com_content&view=article&id=173:wwf-grant-agreements&catid=1:latest-news&Itemid=50 =en, accessed 9/9/09.

5 www.conservation.org/FMG/Articles/Pages/guyana_conservation_concession.aspx, accessed 9/9/09; the Upper Essequibo Conservation Concession Guyana fact sheet; seen at http://www.conservation.org/Documents/guyanaconcession_factsheet.pdf.

Socioeconomic aspects

Economic aspects. An estimated 24 100 people are employed in forest operations in Guyana and 19 800 people in the forest products industry.^b There is also considerable – but un-estimated – informal and unrecorded employment and economic activity. The total value of wood exports in 2008 was US\$56.7 million^b; the country also exported fuelwood valued at about US\$151 000 and NTFPs (not including canned palm hearts) valued at about US\$96 000.^a

Livelihood values. Forests are an integral part of Amerindian culture and are important for the supply of building materials, fibres for textiles and weaving, and tannins and dyes, as well as for wildlife, fruit, seeds and nuts that are hunted or gathered for food. Medicines are obtained from more than 130 plant species (van Andel et al. 2003). Some communities have undertaken the commercial harvesting of these resources.

Social relations. Amerindians comprise 9.1% of the Guyanese population and own 13.9% of the land. Amerindian communities are generally located in areas remote from urban centres and rely on subsistence fishing, shifting cultivation and hunting. The creation of a Ministry of Amerindian Affairs in 1992 has facilitated a more participatory role for these communities in national development. The Amerindian Act (2006), too, gives Amerindian communities legal powers to manage and conserve their lands. Ninety-six communities have titles, but another ten communities do not have formal legal title to the lands they occupy. Guyana's Low Carbon Development Strategy identified, as a priority activity, the titling of these areas.^b The Amerindian Act empowers Amerindian communities to create and enforce protected areas on their lands. A community can, for example, prohibit or control entry and access to its territory and traditional knowledge, prohibit or control mining, zone its lands, protect sacred sites, and regulate hunting, fishing, tourism and research. All Amerindian lands are owned collectively by communities (called 'villages') and administered through village councils (Anon. 2008).

Amerindian communities are afflicted by severe social and health problems, particularly in communities adjacent to gold-mining and timber concessions. The Ministry of Amerindian Affairs and the GGMC have collaborated to train a



A greenheart tree in a logging concession, Guyana.

number of rural residents as rangers to complement GGMC's monitoring efforts in mining districts. The Iwokrama forest initiative has had significant success in involving local Amerindian communities in forest management (Bakken Jensen 2005).

The GFC has managed a number of outreach, communications and extension programs with communities and Amerindian groups. It has established a community forestry program which entails the formation of community forestry organizations, which are provided with access to state forest lands and, in some cases, with equipment. Several Amerindian communities have also been provided with extension services and training in reduced impact logging. In the North Rupununi area, a community forestry project has been implemented, reduced impact logging skills transferred and other forest management services extended (Government of Guyana (2008).

When it comes into force the Forest Bill (2009) will provide communities (including but not restricted to Amerindian communities) with a means of acquiring clear and secure rights to manage and benefit from their local forests on a sustainable basis in order to help meet local needs, stimulate

income generation and economic development, and enhance environmental stability. Under the Bill, properly established community groups can apply to the GFC for community forest use agreements that would authorize the group to occupy a specified area of state forest and to manage it in accordance with the agreement.

The GFC's Community Development Unit, which sits within its Planning and Development Division, has a mandate to build capacity in forest-based communities. Community forestry is being formally undertaken on an area of about 114 000 hectares under SFPs.^a

Summary

Most of Guyana's forests are still intact, unexploited and not threatened by the expansion of agriculture. Guyana is pursuing a well-designed forest management and control system in its timber production forests. A new law, the Forest Bill, is awaiting assent by the President of Guyana. This law will provide for the sustainable management, protection and conservation of state forests and the regulation of forest operations, and it will also make considerable changes to the allocation of state forest for harvesting. The Guyana Forestry Commission appears to be well-organized and responsive and has a substantial field presence. Guyana has made progress in a number of areas, including the development of a legality assurance system and independent forest monitoring, which will not only provide a basis for international scrutiny and access to REDD+ initiatives but also enable the validation and improvement of existing forest management systems. At the forest industry level, however, significant progress is required to fully realize the SFM goal.

Key points

- Guyana has an estimated PFE of 12.2 million hectares (compared with 6.44 million hectares in 2005), comprising 11.1 million hectares of natural production forest (compared with 5.45 million hectares 2005), 1.11 million hectares of protection forest (compared with 980 000 hectares in 2005) and 12 000 hectares of planted forest (the same as reported in 2005).
- A new forest law is due to come into effect.
- Gold-mining is a significant cause of forest degradation and environmental pollution.
- At least 520 000 hectares of production PFE is being managed sustainably. Given the general lack of threats to the forest, the high-quality training available to forest operators, and positive moves by the Guyana Forestry Commission to institute improved tracking and monitoring systems, this is likely an underestimate.
- At least 332 000 hectares of protection PFE is being managed sustainably. Given the general lack of threats to Guyana's forests, this is also likely to be an underestimate.
- Wood exports make a significant contribution to Guyana's foreign-exchange earnings. A new national log export policy has been introduced with the aim of encouraging local wood-processing.
- Guyana has considerable potential for participation in a global REDD+ scheme for avoided deforestation and forest degradation.

Endnotes

- a Government of Guyana (2009).
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