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# Rethinking forest concessions

Improving the allocation of state-owned forests  
for better economic, social and environmental outcomes



FORESTRY  
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PAPER

4

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# Acronyms and abbreviations

<b>CAD</b>	Canada dollar(s)
<b>CAR</b>	corrective action request
<b>CIFOR</b>	Center for International Forestry Research
<b>CIRAD</b>	Centre de Coopération Internationale en Recherche Agronomique pour le Développement
<b>CSR</b>	corporate social responsibility
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FAS</b>	free alongside
<b>FPIC</b>	free, prior and informed consent
<b>FRA</b>	Global Forest Resources Assessment
<b>FSC</b>	Forest Stewardship Council
<b>GBP</b>	United Kingdom pound
<b>ha</b>	hectare(s)
<b>IFL</b>	intact forest landscape
<b>ILCF</b>	investing in locally controlled forestry
<b>ITTO</b>	International Tropical Timber Organization
<b>km</b>	kilometre(s)
<b>kW</b>	kilowatt(s)
<b>m</b>	metre(s)
<b>NGO</b>	non-governmental organization
<b>NTFP</b>	non-timber forest product
<b>PES scheme</b>	payment scheme for ecosystem services
<b>REDD+</b>	reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks
<b>RIL</b>	reduced impact logging
<b>SFB</b>	Brazilian Forest Service
<b>SFM</b>	sustainable forest management
<b>USD</b>	United States dollar(s)
<b>WWF</b>	World Wide Fund for Nature

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## Executive summary

Concessions have existed for hundreds of years as a means of allocating rights to natural resources. In forestry, concessions are the dominant systems for granting rights to public forests in the boreal and tropical regions. They have received mixed press in tropical forests – heavily criticized by some stakeholders and highly praised by others.

This report forms part of a review aimed at providing advice on improving forest concession systems in tropical forests. The review was carried out by FAO in cooperation with the International Tropical Timber Organization, the Brazilian Forest Service, the Center for International Forestry Research and *Centre de Coopération Internationale en Recherche Agronomique pour le Développement*. The report is based on three regional reports produced by consultants, discussions at an expert meeting in Rome in November 2015, and a literature review. The present document is based on a previous document by the same author for the international workshop, *What future for forest concessions and alternative allocation models for managing public forests?* held in Porto Velho, Brazil, on 13–16 September 2016. The title of the previous document was *Forest Concessions – Past Present and Future?*

Concessions are one of many ways in which an owner of forest rights transfers those rights to another party. They generally involve the medium-term to long-term transfer of rights and deal with large areas of public forests. Concession-holders normally pay for timber rights on a volume-extracted basis, an area basis, or a combination of these.

In addition to the right to harvest timber in exchange for the payment of fees, most modern forest concessions require concession-holders to perform a range of duties, such as carrying out forest management and silvicultural measures and providing local communities with social services and infrastructure.

Concessions offer a means by which forest owners (usually governments but sometimes communities and private landowners) can realize the capital value of forest resources in situations in which they have neither the necessary forestry skills nor the capital to finance forest activities themselves. Governments can use their forest capital to meet socio-economic and environmental objectives, such as generating foreign exchange, creating employment, maintaining ecosystem services and earning government revenue.

Forest concessions cover about 123 million hectares in the three tropical regions encompassed by the consultant reports prepared for this review (i.e. Latin America, Southeast Asia and West and Central Africa), accounting for approximately 14 percent of publicly owned forests in those regions. Latin America differs quantitatively from the other two regions due largely to Brazil, which accounts for a large proportion of the total tropical forest area in Latin America but which has only a small area of concessions. In Southeast Asia and West and Central Africa, on the other hand, more than 20 percent of public forest lands is under concessions. The situation regarding



concessions is highly dynamic, with some countries terminating concession systems and others starting new programmes.

Concessions have been criticized, perhaps unfairly, for failures that are more general failures of forest governance than of the concession concept itself and which are symptomatic of wider societal problems. Nevertheless, many concessions have failed for a variety of reasons, including the following:

- Concession-holders lack adequate skills in tropical forest management and silviculture.
- Scientific understanding of tropical silviculture and its economic benefits is poorly developed.
- Weak governance means that concession-holders do not follow the terms of their contracts or the law.

A general problem in tropical forestry affecting concession forests, state forests and privately owned forests is a lack of forest management, which in turn stems from a lack of long-term objectives for forests and their resources. Without long-term objectives, no activities are carried out to ensure the sustained supply of forest goods and services. Forest management plans in the tropics mostly comprise harvesting plans, which, in the best cases, include measures aimed at reducing the negative impacts of harvesting activities. There is rarely a plan to replenish desirable species that are selectively removed by logging, so that the long-term effect of harvesting is the economic extinction of commercially important species.

Silviculture can counteract this and other negative impacts by ensuring the replenishment of commercially important trees. Silviculture is rarely practised, however, because measures such as seedling production, site preparation, weeding and thinning are often considered poor investments given that the “crop” may only be harvested in 40–60 years. Recent studies have shown, however, that certain interventions can be profitable for long-term investors.

A further problem for forestry – and other sectors – in many developing countries is weak governance, exacerbated by the lack of priority afforded forestry by governments, even though it is a significant land use in most tropical countries. The low priority given to forestry ultimately means that forest agencies lack staff of the calibre required to operate effectively in the marketplace, including in the evaluation and oversight of forest concessions. Such institutional weakness leaves concession systems vulnerable to targeting by unethical companies, the corruption of poorly paid government employees, and the failure of government agencies to collect concession fees.

In many countries, forest governance fails to take into proper account the customary rights of forest-dependent people; in such cases, concession allocations can have significant impacts on the rights of local communities and can lead to conflict. Uncertainty about tenure rights can dissuade concession-holders from investing in the silviculture required to achieve sustainable tropical forest management.

An important objective of most forest concessions is to raise revenue, and this can be used, therefore, as a measure of the success of concession systems. Worldwide, gross forest revenues collected by governments are low, at an average of about USD 6

per hectare per year (in Africa, the average is USD 1 per hectare per year, although the benefits of concessions in that region are supposed to be partly delivered through the provision of social services). In practice, almost any other land use could generate more revenue for governments than forestry.

Forest revenue accruing to central administrations is not the only economic factor to be considered, however, with other benefits – such as foreign exchange and employment creation – potentially important. Export revenues earned from forest concessions are highly variable; in a sample of countries, they range from a meagre USD 0.20 per m<sup>3</sup> of logs produced to USD 233 per m<sup>3</sup>. Revenues may be important at the local level: for example, each family in a community concession in Guatemala earns USD 3 760 per year from timber harvesting and a further USD 2 000 from non-timber forest products.

The social benefits of concessions include employment (generally in the range of one full-time-equivalent job per 100–500 hectares) and support for education, water supplies, medical care and transport infrastructure. The provision of social services is often a requirement of concession agreements in West and Central Africa; in other places, the supply of social services has sometimes increased when concession-holders have undertaken forest certification, which can also have strong social impacts by requiring concession-holders to maintain high health and safety standards.

Well-managed concessions have the potential to generate significant environmental benefits. Successful concession-holders acting in partnership with local rightsholders can be an effective force in preventing the illegal settlement and degradation of forest reserves; some concessions have been established for this purpose.

It is widely believed that small concessions held by communities operate better than large industrial concessions. There has been criticism of large concessions, some of which exceed 1 million hectares in area and many of which are in the range of 100 000–200 000 hectares. Very large concessions may result in inefficiencies, especially in systems lacking area-based fees, whereby concession bidders apply for large areas without cost but concentrate on only the “best” (i.e. most profitable) parts, ignoring the rest. This can also lead to the wasteful use of timber because only the best is worth extracting; thus, logs may be abandoned in the forest or sawn with poor equipment that wastes large volumes due to sawing inaccuracies and large kerf widths.

On the other hand, there are also problems with small concessions. Many tropical forests have very low densities of currently valuable trees, perhaps producing only 5–10 m<sup>3</sup> of marketable timber per hectare. To be economically viable, an efficient sawmill is likely to require inputs from an area of 20 000 hectares harvested over a 40-year period to produce marketable amounts of timber from a small group of species. It may be possible, however, to increase the yields of desirable timber through silvicultural interventions, increased knowledge and more intensive management.

There is evidence that, when population pressure is not too high, community-managed forests are more effective than centrally managed forests at preventing forest degradation. Many communities, however, lack the capacity to manage forests and require significant technical and financial support to build such capacity. Many successful community-scale concessions in the tropics have featured significant donor investment.

Forest certification is an important tool for improving tropical forest management carried out in concessions. The most common improvements have been in health and safety, forest management planning, and the use of reduced impact logging. In Africa, certified concessions have had significant positive social and environmental impacts, and increased engagement with communities has led to improvements in “social contracts” with forest dwellers.

It has been argued that tropical timber businesses are insufficiently profitable to generate large forest rents from concession systems because of the low density of desirable trees coupled with the high costs of extraction and transport. If this were the case, there would be a large incentive to make the most efficient use of harvested timber to achieve a competitive advantage in the market. The evidence, however, indicates that waste is high in most forest concessions.

If silvicultural activities were shown to be profitable, it is likely that concession-holders would be much more attentive to their correct implementation. Mostly, however, such activities are seen merely as regulatory or contractual requirements that are of little benefit to concession-holders, and they are often unenforced by weak forest administrations.

Only a small proportion of the timber species available in tropical forests is harvested because the remainder – even if they have desirable wood properties – are unknown in the market. Increasing the number of species accepted by the market would improve the financial viability of tropical forest management by increasing “value density”. The costs associated with bringing new species to market are so high, however, that only the largest companies are able to do so on their own.

Increasingly, governments seek to retain as much timber value as possible within a country through log export bans. Such policies, which began in the 1990s, have been more or less successful. In some countries, the development of internal capacity in the manufacture of value-added products has virtually eliminated log exports. In many other countries, however, log-export bans have led to large-scale illegal log exports; in some, the sudden imposition of log export bans has led to the temporary collapse of export markets.

Perhaps the biggest reason for governments failing to retain timber value has been an inability to collect the revenues due to them: it is rare for governments to collect more than 20 percent of their entitlements due to corruption and systematic evasion.

Another reason for the failure to retain value within a country is the poor industrial performance of processing facilities and the inefficiency of timber markets. Many sawmills in developing countries are equipped with old, worn-out machinery that is incapable of sawing with precision. This leads to timber wastage during processing and to demands by customers for an excessive degree of overmeasure to address the risk that some boards or parts of boards will be below market dimensions. Poor drying – and even a complete lack of seasoning – leads to further losses due to splitting and to further overmeasure requirements. Old, poorly maintained machinery is also far more energy-demanding than modern, well-maintained equipment, meaning excessive energy costs.

Tropical timber markets are highly inefficient. They demand standard dimensions and unnecessarily long lengths of defect-free timber, meaning that large volumes are

rejected. In most cases, standard dimensions bear no relationship to the products to be manufactured. Improved communication between producers and users would lead to significant increases in timber recovery for producers and a reduction in effective costs for buyers, enabling each to increase profits substantially. The manufacture of value-added components using tropical timber is rare.

Privately owned forests in the temperate zone are effectively self-regulating. It has been argued that the tenure security offered by private ownership is the major factor contributing to self-regulation and that this would be replicated in the tropics if tenure security could be guaranteed there. Tenure security would encourage investments in silviculture that would ensure long-term forest productivity. Given the slow growth of forests, however, it is likely that businesses seeking to maximize returns on capital would simply harvest the entire forest estate as quickly as possible and reinvest elsewhere. It is clear that some form of enforceable regulation is necessary.

The situation is exacerbated by other risks faced by investors, potentially leading to even higher requirements for the rate of return on capital. One such risk, which is commonplace in developing countries, is political instability that could lead to arbitrary changes in tenure rules or even the complete loss of tenure.

Illegality is a major issue in tropical timber markets. Mostly it is associated with the informal sector, which is supplied by small-scale sawyers and accounts for the majority of internal markets and exports in most tropical countries. The informal forest sector is mostly small-scale, with individual operators producing tens of cubic metres of timber annually. By definition, the informal sector does not pay royalties or other fees for timber, with the effect of depressing prices for processed timber and reducing the competitiveness of larger, formal operators. The informal sector is often associated with the petty corruption of junior officials.

Illegality also occurs in the larger-scale formal sector in many forms, for example to increase harvest volumes in excess of legal allocations, particularly of high-value species. Such illegality is often accompanied by both small-scale corruption and the grand corruption of senior officials and politicians. Illegality occurs for many reasons and is often accepted as part of “doing business”.

Eliminating corruption is difficult. When forest policy measures are proposed, therefore, the analysis of their impacts should assume that illegality and corruption exist and take its effects into account.

This report discusses scenarios for the future of tropical forest management and concludes that success will only be possible if there are significant improvements in forest governance, forest management and timber business performance.

Forest governance must ensure that stakeholders receive their fair share of benefits. Forest management must be applied to increase the future yields of high-value species. Timber businesses must become much more efficient and reduce wastage at all stages of the supply chain.

Rights-based approaches can be used to improve governance and to respect the customary rights of stakeholders. Rights-based approaches can ensure that customary rightsholders are adequately rewarded when resource rights are allocated to others.

When local rightsholders receive adequate benefits from the forest, they are much more likely to protect and improve the resource. Conversely, when they do not receive such benefits, they are much more likely to view forests as having no value and to actively convert them to other land uses.

The rights of workers are often better respected in the formal sector than in the informal sector. Workers are far better treated, therefore, by responsible and certified concessions than elsewhere in the forest sector.

Forest certification is an important but often misunderstood tool for improving forest management; on its own, however, it cannot make a business successful. Too often, the relationship between forest certification systems and forest managers is in the form of “let us do the absolute minimum required to obtain a certificate”. If, rather, the objective is “let us do the maximum possible to improve our forest management business”, then a forest certificate will be easily attainable if and when it is needed to support the business. Better-managed businesses will lead to increased productivity and profits due to reduced costs and higher revenues.

The report concludes with recommendations for improving tropical forest management and concessions, in four groupings:

1. revised and improved governance;
2. facilitating forest business;
3. improved forest management; and
4. involving local stakeholders.

For concessions to succeed, they must be based on successful business models in which:

- forests are well managed and able to provide an assured flow of all resources;
- tenure rights to forest resources are allocated within a framework of good governance that enables businesses to operate with minimal interference and without corruption; and
- forest products are processed efficiently into high-value goods that return significant value to the forest.









# 1 Introduction

In many tropical countries, as well as in boreal areas of Canada and the Russian Federation, forest concessions have been the dominant governance tool in recent decades for the harvesting and management of natural public/state-owned forests. Concessions have been less important in temperate zones, although they are used in eastern Europe. Concessions are not new: they have been used since the 1700s to allocate a wide range of natural and other kinds of resource (Hardin, 2011), under concession types ranging from the perpetual transfer of rights to much more limited models.

Forest concessions have received a mixed press. In some cases, they have been hailed as notable successes in tropical forest management (Radachowsky *et al.*, 2011; Barnes *et al.*, 2004); in others, they have been vilified as foci of corruption, community disenfranchisement and deforestation (World Rainforest Movement, 2015; Gray, 2002).

There is no international system for reporting on concessions. The regional reports produced for this study indicate that there are at least 123 million hectares of industrial-scale tropical forest concessions in the three study regions (Latin America, Southeast Asia and West and Central Africa), accounting for 14 percent of state-owned forests in those regions (Karsenty, 2015; Table 1). The success or failure of forest management under concessions, therefore, is a key factor in the safeguarding of forest resources at the global level.

TABLE 1  
Summary of forest areas and concession areas included in the three study regions

Region	Total forest area ('000 ha)	Public forest area ('000 ha)	Public production forest area ('000 ha)	Percentage of forest on public lands	Percentage of forests on public lands available for production	Area of industrial concessions ('000 ha)	Percentage of public lands under concessions
Latin America	718 820	425 368	43 582	59	10	18 597	4
Southeast Asia	222 694	180 909	114 920	81	52	48 122	27
West and Central Africa	262 365	260 227	68 173	99	26	56 114	22
<b>Total</b>	<b>1 203 879</b>	<b>866 503</b>	<b>226 675</b>	<b>72</b>	<b>19</b>	<b>122 833</b>	<b>14</b>

Note: See Table 4 for information by country.

Source: Karsenty, 2015.

Against this background, FAO and the International Tropical Timber Organization (ITTO) launched an initiative in collaboration with the Brazilian Forest Service (SFB), the Center for International Forestry Research (CIFOR) and Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) to review

the situation regarding concessions and to make recommendations aimed at guiding decision makers in the implementation of forest concession systems that address the needs of local people, are economically efficient, and maintain the integrity of forest resources (Gray, 2002; FAO, 2001).

This report served as a background document at the international workshop, *What Future for Forest Concessions and Alternative Allocation Models for Managing Public Forests?*, which was held in Porto Velho, Brazil, in September 2016. The report will also be of wider interest to policymakers and other stakeholders interested in regulating the rights to access and use forests, mainstreaming sustainable forest management (SFM), and addressing tenure.

The report builds on three regional reports by Karsenty (2015), Chan (2015) and Gretzinger (2015) on concessions in Latin America, Southeast Asia and West and Central Africa, respectively, which were presented at an expert meeting convened by FAO in Rome on 24–25 November 2015. It is based on evidence presented in those regional reports as well as at the expert meeting and in other relevant sources.

## OBJECTIVE

The objective of this report is to recommend ways in which forest concession systems can be improved so they are better able to meet forest policy objectives, especially in the regulation of rights and management practices. The recommendations made herein are widely applicable and, if implemented, would help make forest concessions more effective and efficient as instruments in forest and tenure policies and in ensuring fully sustainable businesses; ultimately, they would help optimize the contributions of forests to society.

The recommendations cover a wide range of issues, including:

- improving the allocation of concessions;
- improving the governance of concessions;
- ensuring that concessions fit better into social, political and environmental land-use frameworks;
- making concessions more profitable for entrepreneurs, landowners and local communities; and
- ensuring the future of community-managed concessions.

## CONCESSION SYSTEMS

Concessions are legal instruments between two parties – usually the state and a private entity – that confer rights from the state to the private entity in exchange for payments or the provision of services. In the context of forestry, concessions may refer to simple rights to harvest timber or other forest products or to rights to manage forest resources in the long term.

Forest concessions vary enormously in the specific rights and responsibilities they confer. Concessions are well known in other spheres of business, where they are similarly variable. Definitions of concessions, therefore, are highly variable (see box).

## BOX

**Definitions of (forest) concession****Forest concession**

1. A temporary (or terminable) and defined facility involving the use of a forest or its produce, sanctioned by the owner of a forest to individuals or communities — synonym forest privilege.
2. A contract, licence or permit granted to a firm or a person to extract and market timber (timber concession) or other produce commercially from a defined area of the forest within a given period. A timber concession may specify the number, type and size of trees that may be harvested.

Source: Society of American Foresters, 2017.

**Forest concession**

System of awarding harvesting rights to individuals, private companies and/or communities who assume the risk and responsibility of forest resources exploitation and/or management.

Source: FSC, 2015.

**Concession**

The “modern” concession is viewed as a way to deliver services of public and collective interest through an association of private investment and public regulation.

Source: Karsenty, 2007.

**Concession**

Any grant of rights, land, or property by a government, local authority, corporation, or individual.

Source: Collins English Dictionary.

**Concession agreement**

A negotiated contract between a company and a government that gives the company the right to operate a specific business within the government’s jurisdiction, subject to certain conditions. A concession agreement may also refer to an agreement between the owner of a facility and the concession owner or concessionaire that grants the latter exclusive rights to operate a specified business in the facility under specified conditions. Regardless of the type of concession, the concessionaire usually has to pay the party that grants it the concession ongoing fees that may either be a fixed amount or a percentage of revenues.

Source: Investopedia, 2017.

At its most general, a “concession” is simply any granting of rights between two parties, usually governed by terms set out in a contract (concession agreement) between the parties. The application of the term to forest resource rights has become somewhat restricted, and it is usual to talk of forest concessions as between states as owners of resource rights

and other actors – individuals, communities or corporations – as users of that resource. Such rights may or may not be transferrable, and they may also involve multiple parties, such as in the case of private-use permit concessions in Liberia (de Wit, 2012).

Concession agreements are highly variable between countries in their scope, responsibilities and duration and in the way in which charges are levied (Table 2). Notwithstanding this variability, however, forest concessions are generally based on:

- longer-term agreements (> 20 years), usually covering at least one complete harvesting cycle;
- land that is directly owned by the state or allocated to communities;
- the allocation of rights to harvest timber and/or other aboveground resources;
- very large areas of land (> 50 000 hectares) for industrial concessions and somewhat smaller areas (3 000–50 000 hectares) for small and medium-sized operations and community concessions; and
- concession-holders acquiring responsibilities and rights for timber harvesting and forest management.

TABLE 2

**Dimensions on which forest resource rights can be allocated, indicating broadly how commonly this occurs for each criterion in the case of concessions**

Dimension	Duration				
	1 year	2–5 years	6–20 years	21–40 years	41–99 years
Land ownership before concession granted	Private	Lease	State	Communal	Private under communal law
Resource classes granted by concession agreement	Timber only	Non-timber forest products only	Timber + non-timber forest products	All aboveground resources	All resources
Responsibilities of concession-holder	Timber harvesting only	All aspects of forest management	Development of public infrastructure	Provision of public social services	
Fees and taxes levied on concession-holder	Fees paid with application	Fees based on volume harvested	Fees based on area of concession	Fees based on combination of volume and area	Fee based on standing volume
Type of concession-holder	Private individual	Any commercial entity	National commercial entity	Non-resident Community	Resident community
Area of concession	1–100 ha	100–3 000 ha	3 000–30 000 ha	30 000–1 000 000 ha	
Type of process for granting concession	Closed process: private, secret negotiation between government and concession-holder	Qualified process: negotiation based on a pre-qualification of technical and financial competence	Transparent process	Process initiated by concession-holder	Process initiated by authorities

*Note:* Cells highlighted in green are the common situation in concessions, those in orange are less common, and those in yellow are rarely found in concessions. Timber may be further subdivided by species and purpose.

States have other ways of allocating timber rights that are not generally considered to be concessions. The most common alternatives to concessions used by governments to derive revenue from forest resources are:

- standing timber sales;
- log sales (roadside, forest gate, delivered);
- short-term harvest permits;
- medium-term and long-term land leases that include forest resource rights;
- forest land sales;
- joint-venture forestry companies; and
- state-owned “independent” forestry companies.

Along with their rights to manage forests, concession-holders are increasingly obliged to provide social services that are otherwise the direct responsibility of governments. These may include the provision of educational and healthcare infrastructure and services and the development of transport infrastructure.

### Forest tenure and forest rights

Concessions confer on holders certain rights, which usually differ from and are independent of the rights associated with land tenure. There are significant differences among countries in the rights conferred, however: in some cases, forest tenure provides many of the rights associated with land tenure (e.g. privacy and the right to construct infrastructure); in others, land tenure does not include tree tenure.

Forest tenure exists under a variety of rights systems, ranging from formal law to customary law (including informally accepted traditions and practices). The overlap of rights and tenure under the same and different tenure systems can lead to conflict.

Because governments grant concessions under the formal legal system, tenure conflicts are likely between the formal legal rights of concession-holders and the customary or traditional rights of communities living on or using the same land. In Africa, for example, only 16 percent of state-owned forest has no other forest tenure right associated with it (FAO, 2014). In most existing concessions, free, prior and informed consent (FPIC) was not obtained from indigenous peoples and local communities before the land was allocated.

### Concessions and responsibilities

Parties to concession contracts have responsibilities under those contracts. In offering concessions, governments have a responsibility to ensure that the forest resource will be used for the benefit of the people. Governments also have responsibilities to the global community under various international conventions and treaties to which they subscribe, which may limit how they can deal with their forests. Importantly, the rights assumed by governments to dispose of forest resources often predate independence and were put in place for the benefit of colonial authorities, with little or no consideration of local populations.

Concession-holders have responsibilities set out in commercial contracts with the state, and they are also obliged to adhere to local, national and international laws. Responsible businesses are expected to operate in line with the United Nations Global Compact,

which requires the fair treatment of labour, respect for human rights, the avoidance of corrupt practices, and the minimization of negative environmental impacts.

In some cases, communities are directly involved in concession management through tripartite contracts (i.e. between the state, a company and a community); in all concessions, communities are likely to be affected parties. In practice, community benefits are often contained in social responsibility agreements, which may only offer communities limited benefits. Communities often need support from non-governmental organizations (NGOs) and others in order to negotiate fair social responsibility agreements.

### **Concessions and their benefits**

Governments should manage state-owned natural resources principally for the benefit of their citizens. In most developed countries (with Canada and the Russian Federation being exceptions), governments manage state forests using their own resources and derive value from the multiple products and services that forests provide (e.g. tourism, hunting, water supply and timber). Timber is most often sold as standing timber, although, in some countries, state-owned forest organizations sell logs at the roadside or delivered to processing facilities.

In tropical countries, most governments lack the human resources and capital to manage their own forests and therefore they employ agents to do so on their behalf by means of concessions. Governments develop concession systems to meet multiple objectives and to achieve multiple benefits such as social, environmental and local economic development, revenue generation and foreign exchange.

Concessions are allocated to commercial companies, which are expected to pay for the timber they harvest (forest rent) and to render a range of economic, social and environmental services in exchange for their exclusive rights. In relation to the forest resource, such services could include all aspects of the forest management cycle, such as inventory, harvesting, regeneration, silviculture and biodiversity management. Social development services may include the provision of schools and medical facilities, facilities for forest regulatory agencies, and general infrastructure such as water and power supply, roads and bridges.

For the concession model to work, companies must be capable of making a profit from the timber resources while meeting the costs of the socio-economic and ecosystem services they are expected to supply.

Recently, governments have made forests available as conservation concessions in which the main objective is the maintenance of biodiversity and ecosystem services. Such concessions are usually funded externally, such as through payment schemes for ecosystem services (PES schemes). This type of concession is not discussed further in this report.

### **Concessions and sustainable forest management**

Concession-holders, in partnership with government agencies, are expected to achieve SFM. Responsibilities in such partnerships can be divided in many ways, with government agencies taking more or less responsibility for aspects such as inventory, land-use allocations, harvest allocations and biodiversity conservation.

In recent years, FAO has commissioned studies aimed at identifying cases of exemplary tropical forest management (e.g. Amsallem *et al.*, 2003; Durst *et al.*, 2005; Sabogal and Casaza, 2010); of 227 cases that were nominated or selected as exemplary in these studies, 27 were concessions. Although this is a small percentage of the total number of cases, the concession examples were generally much larger in area than the others and therefore they represented a significant part of the tropical forest estate under management. The exemplary cases involving concessions were mostly in the three regions considered in this study (Table 1), and they represent about 3 percent of the total area of concessions in those regions.

If the 27 cases can be considered exemplary, it is likely that other concessions are achieving good or adequate forest management, including concessions certified by reputable certification schemes.

Criteria for evaluating SFM rarely deal quantitatively with the benefits derived from a forest. This can be considered a limitation because, at the local level, individual decisions based on the benefits likely to be derived from a forest determine the future of that forest. If an individual perceives that the benefits accruing from an alternative land use are greater than those arising from forest use, he or she is likely to choose to replace forests with the alternative.

The quantity of benefits derived from a forest will similarly influence government decision making, with few governments prepared to make large investments in forest management if revenues are likely to be low. This is clear from the emphasis that governments in forest-rich countries place, in discussions on REDD+, on payments for forest protection.<sup>1</sup>

### Poor forest management

Forest management in the tropics, including in concessions, is generally poor. Perhaps the most important reason for this is the failure to set *a priori* objectives based on the range of goods and services a forest is expected to supply now and in the future. When objectives have been determined, a model should be developed for how they can be achieved in the long term. Among other things, this requires a vision of the tree species and their age/size distribution in the future forest and a silvicultural plan for achieving such a distribution.

The lack of long-term objectives for forests means that many forest management plans have little to do with forest management; they are better described as reduced impact harvesting plans with environmental and social safeguards. The lack of proper forest management planning has led to a range of forest “management” systems with little or no basis in a scientific understanding of forest dynamics. Such systems can lead to forest degradation and the economic extinction of species targeted for harvesting. The continued failure to implement forest management would likely prove disastrous for forests and their accompanying biodiversity.

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<sup>1</sup> REDD+ = reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.



Silviculture – defined as the active management of forest vegetation to achieve forest resource objectives – is absent in most tropical forests. Silviculture for timber production requires an understanding of the ecology of timber trees as part of forest ecosystems. Such understanding is increasing in the tropics but still falls far short of the knowledge available in temperate forests, where research began much earlier in response to the depletion of temperate timber resources and the subsequent establishment of large-scale, industrially oriented forests.

Nevertheless, there is sufficient knowledge of tropical forests to show that certain interventions can ensure a sustainable timber supply. For example, the active management and enrichment planting of canopy gaps created by harvesting has been shown to be both ecologically and economically viable.

The application of silviculture involves costs that need to be supported by future returns, but forest managers are reluctant to incur such costs if the future benefits are unclear. Concession-holders are unlikely to engage voluntarily in silviculture, for example, if future forest tenure is uncertain. They are equally unlikely to carry out legally required silviculture when the governance and enforcement of contracts is weak.

### **Are expectations of concessions realistic?**

Concessions are expected to deliver SFM while simultaneously offering significant financial returns to states and concession-holders. Until recently, SFM – in a broad sense – was not considered in concession models at all, and concession-holders simply harvested timber and shared (to a greater or lesser extent) their income with the state. Under this model, concession-holders may be expected to be good at extracting timber at the lowest cost and to pay little attention to other aspects.

In modern concessions, concession-holders are expected to fulfil an enormous range of additional tasks, many of which have nothing to do with forestry (e.g. the provision of healthcare and education), as well as additional tasks as part of SFM (e.g. biodiversity management and silviculture). Most older concession companies lack the trained staff to carry out such tasks: experienced managers of tropical forest biodiversity are not widely available because most of the expertise is concentrated in academic and research organizations.

### **Institutional settings and concessions**

In almost all cases, tropical countries with concession systems have instituted such systems at least partly because of the widespread lack of human resource capacity, which also means that, generally, forest governance is weak. Forest agencies are not usually priorities for government funding, and this is reflected in the fact that, although forests often account for more than 40 percent of the land area, the heads of forest agencies rarely report directly to ministers responsible for forests. The lack of capacity in the forest sector also has an impact on the competence of the staff involved in evaluating concessions and supervising concession contracts. Moreover, it encourages the take-up of concessions by companies that exploit this lack of capacity by failing to comply with the terms of concessions and with forestry laws in general.

One effect of the low remuneration available to staff in regulatory authorities and the overall lack of capacity is that the corruption of government officials is commonplace in the forest sector. Poorly paid officials come to rely on facilitation payments to survive, with the further consequence of reducing state revenues from forests due to non-collection.



## 2 Concessions around the world: successes, failures and lessons learned

There are no consolidated global data on forest concessions. The Global Forest Resources Assessment (FRA) (FAO, 2010), reporting on management rights in publicly owned forests, showed that the share of public forests managed by private businesses increased from 3 percent in 1990 to 15 percent in 2010. Some countries (e.g. Cambodia and Mozambique) report (on a voluntary basis) on the area of, or volume of timber production in, forest concessions in their FRA country reports, based on administrative records or ad hoc studies.

Although this report focuses on concessions in tropical countries, there are forest concessions in other parts of the world, too. By far the largest concession areas are in the cool temperate and boreal forest zones of Canada and the Russian Federation. In Canada, 265 million hectares of forest (76 percent of the total forest cover) is under forest concessions (Global Forest Watch, 2014). In the Russian Federation, more than 600 million hectares (68 percent of the total forest cover) is defined as production forest (FAO, 2012), almost all of it state-owned and available as concessions.

A forest-sector outlook study on the Russian Federation (FAO, 2012) identified illegal logging as a significant problem in the country, with up to 20 percent of all timber and 50 percent of timber in the Russian Far East harvested without proper permits. Corruption in the sector appears to play an important role in facilitating illegal business. It is clear that large volumes are being either taken directly (by harvesting outside permitted areas) or laundered through concession-holders.

Canada's concession system appears to have been more successful, but it has been criticized for several reasons: most concessions are allocated by negotiation (Gray, 2003a) rather than by competitive tender; there have been problematic cases of overlapping tenure (Gray, 2003a); and low stumpage prices have been characterized as a form of subsidy for Canadian forest companies (Myers and Kent, 2001).

### CONCESSIONS IN LATIN AMERICA, SOUTHEAST ASIA AND WEST AND CENTRAL AFRICA

Consultants investigated concession systems in the tropical regions of Latin America, Southeast Asia and West and Central Africa as part of this study. Most forest revenues in these regions<sup>2</sup> are expected to flow to government as concession-related fees and it is instructive, therefore, to determine the extent to which such revenues are actually received – in many cases, these revenues are the principal justification for assigning concessions.

<sup>2</sup> Some countries also collect revenues for non-timber forest products and fuelwood from local community members.



Table 3 shows that, worldwide, forest revenues from publicly owned lands average approximately USD 6/ha/year; the average is much lower in Africa, at only USD 1/ha/year. Revenues are also much lower per volume of timber in Africa than in the other regions shown in Table 3. Note that revenues for Papua New Guinea are included in the estimates for Oceania, inflating that region's revenue per unit area in public forests because only 3 percent of land in Papua New Guinea is state-owned and the government levies taxes on timber harvested on community land. Note also that revenues in Europe are much more likely to be based on softwoods; revenues from tropical forests are mostly derived from hardwoods, which generally are considered higher-value timbers.

TABLE 3  
Forest revenues, by region

Region	Information availability		Forest revenue in 2005					
	Number of countries	% of total forest area	Total		Revenue per ha (USD)		Revenue per m <sup>3</sup> (USD)	
			Million USD	%	All areas	Public area	All removals	Adjusted <sup>^</sup>
Africa	31	63	285	2	1	1	1.24	6.85
Asia	22	88	2 846	19	5	7	4.31	18.92
Europe	20	89	5 420	37	6	6	13.39	17.72
North and Central America*	14	90	2 620	18	4	6	3.40	5.56
Oceania	7	20	146	1	4	23	5.33	33.24
South America	7	76	3 290	23	5	6	10.80	26.50
<b>World</b>	<b>101</b>	<b>79</b>	<b>14 607</b>	<b>100</b>	<b>5</b>	<b>6</b>	<b>6.09</b>	<b>12.34</b>

Note: \* These figures use revenue data for 2000 for the United States of America (data for 2005 were unavailable).

<sup>^</sup> Excludes fuelwood production and production from private forests (based on share of total forest area).

Source: FAO, 2010.

## Where are the concessions?

The tropical regions covered by the consultant studies differ markedly in the area under concessions (Table 4). The relatively low area under concessions in Latin America is due largely to the effect of Brazil, which accounts for almost 75 percent of the forest area of the studied countries at 516 million hectares, of which 313 million hectares is in public ownership but only 840 000 hectares is allocated to concessions. If Brazil is excluded, Latin America is similar to the other regions in the percentage area under concessions.

Concession systems are dynamic, with countries increasing and decreasing concession areas rapidly in response to, for example, changes of government and pressure from stakeholders. In Bolivia (Plurinational State of), for example, the area under forest concessions decreased rapidly in the 2000s as land was allocated to indigenous community forestry. The area under concessions also decreased in Cambodia in the 2000s as concessions were cancelled due to perceptions of mismanagement, while the area increased in Brazil due to the start-up of a new concessions programme.

TABLE 4

**Area of natural forests and concessions, by country, in the three studied regions**

	Total forest area ('000 ha)	Public forest area ('000 ha)	Area of public forests available for production ('000 ha)	Percentage of forests on public lands	Percentage of production forests on public lands	Area of industrial concessions	Percentage of public lands under concessions
Bolivia (Plurinational State of)	53 500	38 611	8 987	72	23	2 107	5
Brazil	516 000	313 000	4 300	61	1.37	840	0.27
Guatemala	3 657	1 536	450	42	29	450	29
Guyana	15 200	12 200	6 850	80	56	6 500	53
Peru	67 992	18 821	5 513	28	29	7 110	38
Suriname	14 758	11 300	4 482	77	40	1 090	10
Venezuela (Bolivarian Republic of)	47 713	29 900	13 000	63	43	500	2
<b>Total (Latin America)</b>	<b>718 820</b>	<b>425 368</b>	<b>43 582</b>	<b>59</b>	<b>10</b>	<b>18 597</b>	<b>4</b>
Cambodia	10 094	10 094	3 331	100	33	3 300	33
Indonesia	94 432	85 933	56 093	91	59	23 992	28
Lao People's Democratic Republic	15 751	15 751	3 623	100	23	600	4
Malaysia	20 456	20 047	12 683	98	62	9 230	46
Myanmar^	31 773	31 773	19 699	100	62	Unknown	Unknown
Papua New Guinea*	28 726	862	7 182	3	25	11 000	38
Philippines	7 665	6 515	5 825	85	76	0	0
Viet Nam	13 797	9 934	6 485	72	47	0	0
<b>Total (Southeast Asia)</b>	<b>222 694</b>	<b>180 909</b>	<b>114 920</b>	<b>81</b>	<b>52</b>	<b>48 122</b>	<b>27</b>
Cameroon	19 916	19 916	14 539	100	73	7 059	35
Central African Republic	22 605	20 571	4 747	91	21	3 059	15
Congo	22 411	22 411	19 722	100	88	12 600	56
Côte d'Ivoire	10 403	10 299	9 259	99	89	700	7
Democratic Republic of the Congo	154 135	154 135	7 707	100	5	12 184	8
Equatorial Guinea	1 626	1 626	81	100	5	740	46
Gabon	22 000	22 000	9 900	100	45	14 272	65
Ghana	4 940	4 940	1 136	100	23	3 200	65
Liberia	4 329	4 329	1 082	100	25	2 300	53
<b>Total (West and Central Africa)</b>	<b>262 365</b>	<b>260 227</b>	<b>68 173</b>	<b>99</b>	<b>26</b>	<b>56 114</b>	<b>22</b>
<b>Total (three regions)</b>	<b>1 203 879</b>	<b>866 503</b>	<b>226 675</b>	<b>72</b>	<b>19</b>	<b>122 833</b>	<b>14</b>

Notes: \* In Papua New Guinea, concessions are issued over land owned by communities (the percentage shown is of the total forest area). ^ Concessions are known to exist in Myanmar. The scale is unknown, but there are large areas in border areas.

Source: Chan (2015); FAO (2010); Gretzinger (2015); Karsenty (2015).

## What are the benefits of concessions?

### *Economic benefits*

In most cases, the initial motivation for offering concessions is to generate economic activity. The extent to which this is achieved can be assessed in a number of ways, but information is often not directly comparable between countries. Table 3 shows that, in South America and Southeast Asia, forests have often had a positive impact on government revenue, at an average value of about USD 5/ha/year; the contribution to government revenue is significantly less than this in Africa, at about USD 1/ha/year. It may be that the difference is not as great as it seems if, as has been suggested, concessions in Africa contribute more “in kind”, such as by providing social services. Nevertheless, there are notable differences between countries: Myanmar appears to generate approximately USD 0.20 in export revenues per m<sup>3</sup> of timber harvested, while Malaysia earns USD 215/m<sup>3</sup> (Table 5). Brazil generates a meagre USD 32/m<sup>3</sup> in exports, but the majority of its log production in natural forests is consumed by the country’s enormous internal market. Cambodia is also anomalous because most of the timber produced is from forest conversion (which has occurred recently at a rate of about 200 000 ha/year) (Banks *et al.*, 2014); although there are large volumes of timber, most is exported illegally, and the actual return per unit volume of timber harvested is much lower than that shown in Table 5.

TABLE 5  
Volume of logs harvested, and value of export sales, in selected countries

Country	Log production (m <sup>3</sup> )	Total exports (USD)	Value of exports per m <sup>3</sup> of production (USD/m <sup>3</sup> )
Brazil	13 500 000	437 000 000	32.37
Cambodia	275 000	61 416 000	223.33
Guyana	299 000	48 100 000	160.87
Indonesia	45 587 000	2 571 763 000	56.41
Malaysia	17 170 000	3 695 633 000	215.24
Myanmar	5 290 000	1 053 284	0.20
Philippines	3 627 000	124,928,000	34.44
Suriname	308 000	1 900 000	6.17
<b>Thailand</b>	<b>8 700 000</b>	<b>658 663 000</b>	<b>75.71</b>

Sources: Chan (2015); Gretzinger (2015); Karsenty (2015).

It is clear that, at least in some cases, logs harvested in concessions are making significant contributions to countries’ balance of payments.

Table 3 shows all types of forest revenue for all types of forest. Revenues per unit volume are more comparable because they include only revenues from publicly owned forests and exclude woodfuel. They range from about USD 6/m<sup>3</sup> in Africa to USD 26/m<sup>3</sup> in South America. In both cases, the species are predominantly tropical hardwoods.



In Liberia, the government has set high fees for tropical hardwoods but has had difficulty collecting them. One study found that only 5 percent of fees were collected (IBI Consultants, 2013).

Estimates of the benefits of concessions at the local level are hard to find, but some data have been published for concessions in northern Guatemala, where the concession system is considered successful (Radachowsky *et al.*, 2011; Gómez and Méndez, 2005). Concessions occupy about 0.5 million hectares of the Maya Biosphere Reserve; they include industrial, non-resident community and resident community concessions. Some of the resident community concessions have significant numbers of recent immigrants with no previous forest experience. Table 6 shows that population density is low in the concessions, at about 11 km<sup>2</sup> of forest per group member<sup>3</sup> and 2 km<sup>2</sup> of forest per beneficiary.<sup>4</sup> Land parcels of 100 hectares per beneficiary or more would be considered large in many parts of the world.

TABLE 6

**Areas and beneficiaries of Maya Biosphere Reserve concessions, by concession type**

	Concession type				Total
	Industrial	Non-resident	Resident community	Resident community with immigrants	
No. of concessions	2	6	2	4	14
Area (ha)	132 304	195 084	137 356	68 392	533 136
No. beneficiaries		708	916	380	2 004
No. of members		129	167	69	365
Area/member (ha)		1 512	822	991	1 098*
Area/beneficiary (ha)		276	150	180	200^

Notes: \* Average area per member across the three concession types. ^ Average area per beneficiary across the three concession types.

Source: Adapted from Radachowsky *et al.* (2011).

In one of the Guatemalan concessions, the harvest rate in 1994 was approximately 4 m<sup>3</sup>/ha of roundwood, yielding a return of USD 218/ha (Gretzinger, 1998); this equates to about USD 8/ha/year on a 25-year cutting cycle. By 2011, the community of San Andres was selling timber products worth USD 830 000 from its concession of 51 939 hectares, generating an average net profit of USD 3 761 for each member family at a rate of USD 16.30/ha/year – a very significant benefit. This rate of return was achieved by investing in harvesting and processing equipment and selling dimensioned lumber in national and export markets.

The harvesting of non-timber forest products (NTFPs) is also an important source of income in the Maya Biosphere Reserve concessions, generating about USD 2 500/person/year

<sup>3</sup> Members are families (or heads of family) and beneficiaries are individual family members.

<sup>4</sup> Densities differ between studies (e.g. Reyes *et al.*, 2014), but the order of magnitude is comparable (i.e. densities are in the order of km<sup>2</sup> per beneficiary rather than hectares per beneficiary).

for 2 000 workers (full-time equivalent). In practice, families earn, on average, about USD 2 000/year (Radachowsky *et al.*, 2011). The economic benefits of the concession system in the Maya Biosphere Reserve were made possible by significant foreign development assistance, estimated at USD 92 million (Gómez and Méndez, 2005) between 1989 and 2003, which equates to USD 180/ha or USD 46 000 per beneficiary.

### *Social benefits*

Concessions can provide various social benefits (Table 7). Some arise to a greater or lesser extent from activities associated with the concession (Lescuyer *et al.*, 2012) and others are generated by corporate social responsibility (CSR) programmes or as a result of contractual obligations placed on concession-holders (Karsenty, 2015). Certain benefits are strongly associated with forest certification.

In addition to income-sharing, a significant amount of work is created in the Maya Biosphere Reserve by harvesting and processing activities that add considerably to the income of individuals both within and outside the concessions (Gómez and Méndez, 2005). Foreign development assistance investment in the reserve also created significant economic activity in the district, although a large proportion of funds were likely spent on the salaries of external consultants and in supporting them in the field.

It is estimated that concessions create one job (full-time equivalent) for every 500 hectares under management in Brazil (Gretzinger, 2015) and approximately one job (full-time equivalent) for every 250 hectares under management in the Maya Biosphere Reserve.

TABLE 7

#### **Typical social benefits associated with forest concessions**

<b>Social benefits associated with the operation of a concession</b>
<ul style="list-style-type: none"> <li>• Employment</li> <li>• Skills training</li> <li>• Road and transport development and maintenance</li> </ul>
<b>Social benefits as a result of corporate social responsibility programmes or contractual obligations</b>
<ul style="list-style-type: none"> <li>• Improved communication with stakeholders</li> <li>• Educational facilities</li> <li>• Medical facilities</li> <li>• Company shops</li> <li>• Local sourcing of goods and services</li> </ul>
<b>Social benefits associated with forest management certification</b>
<ul style="list-style-type: none"> <li>• Improved health and safety conditions for workers</li> <li>• Improved job security</li> <li>• Provision of water</li> <li>• Provision of electricity</li> <li>• Recognition of indigenous peoples' rights</li> </ul>

It is clear that, in the absence of forest certification, contractual obligations associated with concessions are the main driving force for the provision of social benefits in West and Central Africa. This seems to be due largely to an increasing emphasis on “in kind”

contributions in lieu of monetary payments by governments in the region (Karsenty, 2015). There is a much higher degree of legal compliance in certified forest concessions and also a higher degree of voluntary social activities beyond legal or contractual requirements.

Improvements in health and safety conditions for workers are strongly influenced by the requirements of forest certification schemes. This aspect is particularly important in Africa, where the social security net is almost non-existent and where the loss or incapacitation of workers has catastrophic consequences for their dependents.

In Latin America and Southeast Asia there is a tendency for social benefits to be restricted to those associated with normal operations; in Southeast Asia, significant problems are often caused by violations of customary rights. Even the forest concessions in Southeast Asia identified as “exemplary” by Durst *et al.* (2005) are not highlighted for their impacts on social development – although they may have achieved better community relations.

### *Environmental benefits*

The potential environmental benefits of sustainably managed and profitable concessions are huge. There is a strong chance that forests will remain functional when forest managers successfully prevent illegal settlement, forest clearing, timber theft and the overharvesting of NTFPs.<sup>5</sup> Such forests will contribute to maintaining biodiversity and provide important ecosystem services, such as the supply of clean water and carbon sequestration.

The concessions in the Maya Biosphere Reserve established primarily to protect forests appear to have been highly successful (albeit with large investments of foreign aid). Of the concessions originally issued by the government, only two have suffered from significant encroachment and conversion to grazing pasture (authorities consequently cancelled both concessions).

In Southeast Asia and elsewhere, the introduction of reduced impact logging (RIL) has significantly reduced the negative impacts of logging in many concessions.

PES schemes, if implemented effectively (such as in the Rukinga Wildlife Sanctuary in savannah woodland in Kenya; Rukinga Ranch, Ltd., 2008), have the potential to increase the environmental benefits of concessions by providing additional income streams to support conservation. It seems likely that a PES scheme could be applied directly to the Maya Biosphere Reserve; payments under the REDD+ framework have been suggested for the reserve that would effectively double the income earned per hectare (Hodgdon, Hayward and Samayoa, 2013).

### **Concessions as a means of protecting forests**

The history of concessions as a means of protecting forests has not been a happy one in any of the three regions. In Ghana, for example, concessions have been implicated in large-scale forest destruction through legally approved overharvesting (Oduro *et al.*, 2011), illegal harvesting, and a failure to protect forests from encroachment.

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<sup>5</sup> It is assumed that successful forest managers have engaged sufficiently with communities to ensure that those communities perceive forest conservation and protection as beneficial to them.

It would be an oversimplification to blame forest loss solely on concessions, however, because a wide range of other activities have contributed to forest loss on a large scale (WWF, 2015). Logging is usually considered a secondary cause of deforestation after large-scale arable and pastoral agriculture.

The protection of forests is dependent on a social contract in which parties agree on the land use. Such agreement will only be reached if all parties are able to perceive that they benefit from the existence of the forest to a sufficient extent to offset the opportunity costs of other land uses. In many countries, governments and landowners are unable to resist the temptation of deforestation in the face of a range of compelling forces. Deforestation for agriculture takes place at the scale of the individual as well as of the large landholder; when corruption is rife, deforestation is also often done with the connivance of senior figures in government.

Concessions could be an important means of avoiding deforestation if agreement can be obtained among all forest-level stakeholders on forest management and on the division of benefits from the forest that properly takes into account all legal and customary rights. The concession approach has proved successful on community-managed lands in Zambia, where a single chiefdom can now muster more forest guards than the entire national forest service (D. Lewis, COMACO, personal communication, 2015).

## **PUBLIC FOREST CONCESSIONS IN OTHER REGIONS**

Publicly owned forests exist in almost all countries. In general, all countries seek to use such forests to produce economic and social benefits, but these differ significantly in different types of society and among different interest groups within societies. To a large extent, the ways in which people in different societies value their forests determine how they are used. In some countries, forests are valued more as recreational and landscape resources than for their timber and NTFPs.

These differences in public perception are likely to influence the amount of resources governments are prepared to invest in forest protection and management. For example, there was a public outcry in the United Kingdom of Great Britain and Northern Ireland when, in 2011, the government proposed privatizing part of the public forest estate (Bennett and Hirst, 2014), which is fully managed by the Forestry Commission and its commercial arm, Forest Enterprise. The state directly controls or carries out all management activities, and timber is sold either standing or at the roadside (30 percent). The income generated by timber sales from an area of 250 000 hectares is valued at GBP 20 million/year, equivalent to USD 114/ha/year (Forest Enterprise England, 2015). The income earned by Forest Enterprise from all sources is about USD 350/ha/year; this is offset by management costs so that, overall, the nation subsidizes the forest estate by about USD 50/ha/year. The public benefit derived from this public investment has been estimated at about USD 400/ha/year (Our Forests, 2013), thereby justifying the government investment.

The positive outcome for investments in publicly owned forests in the United Kingdom of Great Britain and Northern Ireland appears to be reflected in most European countries and in the United States of America, where state-managed forests generate good net

returns for governments. In almost all countries in Europe, the sale of standing timber is the major means of generating forest revenue. In the United States of America, the timber parcels on sale tend to be relatively small, ranging from tens to thousands of cubic metres (Bureau of Land Management, 2015). Buyers are required to adhere to strict harvesting performance standards (Bureau of Land Management, 2015), and harvesting licences are typically offered for only short durations (1–3 years).

Slovenia and Montenegro both employ traditional concession systems (Ferlin and Golob, 2012). In Slovenia, a concession system was established after the break-up of the Soviet Union and the end of communist influence in eastern Europe when state-owned forest companies were privatized and allocated 20-year concessions. In Montenegro, where forests were depleted due to previous mismanagement, concessions started to be issued after legislative changes in 2008. These concessions are for durations of 7–30 years and for both timber harvesting and the rendering of practical management services; they do not include management planning, however.

Both Slovenia and Montenegro have experienced problems with their concession systems. For various reasons, neither country has obtained the forest revenues expected and, as a result, the central forest administrations have been left short of finances. In Slovenia, revenue calculations are based on prices set according to the cost of production and timber prices. Companies have been able to argue, however, that prices are lower than reality and that costs are higher, thus reducing government revenues. In Montenegro, where stumpages are higher, 70 percent of revenues are allocated to local municipalities. The harvested volumes have been lower than expected, too, and the central forest administration is not receiving sufficient income to carry out its management planning and supervisory functions. In Slovenia, the concession system may be terminated when existing concessions expire (Ferlin and Golob, 2012).

### **WHY ARE SOME CONCESSION SYSTEMS MORE SUCCESSFUL THAN OTHERS?**

Some concession systems can be considered largely successful, and some individual concessions are viewed as examples of exemplary forest management.

Notwithstanding the problems (Gray, 2003a), Canada's forest concessions have been overwhelmingly successful in economic terms, even if not in direct revenue terms. The Canadian forest sector makes an annual contribution to gross domestic product of CAD 20 billion (Canadian Forest Service, 2014), derived primarily from concessions in the more than 90 percent of forests that are state-owned (either federally or provincially). This contribution derives from a total forest base of 347 million hectares, equating to a contribution of CAD 57/ha/year (an average for all forests, including large areas not used commercially). The forest sector employs about 300 000 people with a payroll in excess of CAD 8 billion. Almost 50 percent of Canada's forest area is third-party certified under at least one independent forest management certification scheme; about 20 million hectares is certified under more than one scheme.

Although on a smaller scale and also not without problems, the Maya Biosphere Reserve concessions discussed above can also be considered successful, although they are yet to achieve their full potential in generating benefits for communities.

In Malaysia, the Deramakot concession may be considered successful (Lagan, Mannan and Matsubayashi, 2007); it generates 20 000 m<sup>3</sup> of timber per year from an area of 51 000 hectares and simultaneously fulfils conservation goals for a range of large mammals, including orangutan. Success has been achieved through the introduction of RIL and intensive silviculture and, as for the Maya Biosphere Reserve, with substantial donor support.

On the other hand, many concessions have failed for a wide range of reasons, including governance and economic, social and environmental factors.

### **Small concessions versus large concessions**

It is widely held that the transfer of forest tenure to forest communities will lead to improved forest management when the areas involved are small. Determining whether these propositions are reasonable and supported by evidence requires assumptions on what constitutes success for stakeholders.

In the Congo, Danzer-IFO holds rights over more than 1 million hectares of forest in a single concession (Karsenty, 2015) – this is an area somewhat smaller than Jamaica and Lebanon but larger than the Gambia and the island of Cyprus and twice as large as Brunei Darussalam and Trinidad and Tobago. Although this concession is unusually large, the average concession size in the Congo is 240 000 hectares (Global Forest Watch, 2016), which is almost the size of Luxembourg.

Many such concessions are in remote areas, their human population density is very low (e.g. 0.5 person/km<sup>2</sup>; WWF, 2015b), and there is little infrastructure. Nevertheless, the allocation of such large concessions by government can lead to a wide range of problems. Wherever there are people, particularly indigenous and traditional communities, the allocation of tenure rights by central governments is likely to infringe the customary rights of those communities. Even forests that appear to be unoccupied or unused often provide communities with crucial resources. In villages around the town of Nzara in South Sudan, for example, local people make annual two-week excursions to remote forests about 70 km north of the town to hunt and obtain meat, a key resource in an area where animal protein is very expensive. In such situations, concessions may not cause immediate local competition for resources such as timber and NTFPs, but there may be longer-term impacts.

Large concessions can lead to inefficient forest use, resulting in losses of potential income. This is particularly likely when area-based fees are very low or non-existent (Gray, 2002).

Where the cost of holding a concession is low, concession-holders are likely to seek larger areas simply to secure resources should their value increase in the future (Grut, Gray and Egli, 1991). Low effective timber prices reduce the revenues received by governments and affect the behaviour of rightsholders. Low pricing falsely signals that a resource is in overabundance, which results in wasteful use. This wastefulness occurs in all parts of the value-chain – such as logs forgotten in the forest; logs abandoned at log landings; logs left to rot in sawmill log yards; logs sawn with equipment that wastes perhaps 20 percent of the volume due to excessive kerfs and inaccuracies; and boards

lost due to bad drying processes. Concentrating the majority of a country's timber stock in a few hands creates an effective monopoly in which companies have insufficient motivation to introduce efficiencies that would enable the retention of greater value in the country or region of production.

Although overly large concessions can be seen as negative for these reasons, overly small concessions are also likely to have problems, for other reasons. Small concessions produce small volumes and have small incomes. As a result, concession managers may have insufficient capacity to engage in international timber markets on fair terms (although they may be well placed to service internal markets).

The international timber market is largely traded in two ways: round logs loaded in bulk; and boards cut to standard dimensions and loaded into containers. Small concession-holders are unlikely to have access to the heavy equipment required to extract long logs from the forest and will be restricted to markets in processed boards. If they do sell logs they will be forced to do so to local traders, who will take a disproportionate share of the timber value.

If selling processed boards, small concession-holders will be required to satisfy market demand for standard dimensions and long board lengths and will not be in a position to dry timber before shipping; thus, they will be restricted to the lower end of the value spectrum. More importantly, however, shipping is done using standard containers, which have a loaded capacity of approximately 30 m<sup>3</sup> of sawnwood. This is the minimum shipping volume that makes economic sense because the timber must be containerized to prevent saltwater damage and excessive drying and for fumigation to meet phytosanitary regulations.

In most cases, the production of 30 m<sup>3</sup> of sawnwood requires the harvesting of 150 m<sup>3</sup> of logs. If all logs are of one species, the full yield of 30 hectares (at 5 m<sup>3</sup>/ha; Karsenty, 2015) might be required to fill one container. In reality, there will be six or seven species of interest, requiring a minimum annual harvest area of about 200 hectares if all species are distributed uniformly. Species are not distributed uniformly, however; to satisfy demand, therefore, up to 500 hectares per year might be required. If this is managed on a 40-year return cycle, the minimum viable management unit would be a production area of 20 000 hectares. This could be managed to produce 2 000–4 000 m<sup>3</sup> of logs per year and perhaps 500–1 500 m<sup>3</sup> of export boards. This assumes that standard practices are maintained and that there is little or no silviculture. Thus, it is difficult for small concessions to produce sufficient timber to meet basic market requirements.

There may be other advantages of smaller concessions; for example, smaller areas may be easier to protect from illegal activities. Perhaps more importantly, managers of small concessions are likely to be more familiar with their forests, and they can use their greater knowledge to refine harvesting and silvicultural plans to make better use of existing stock and increase regeneration rates. A European forest manager with an estate of 1 000 hectares will have knowledge of every stand (and every important high-value tree) on the estate and will use this knowledge to produce timber in response to changing market demand – when demand is low and prices are down, for example, the manager will cut less and reserve stock for the future when prices are high. Specific trees can be



retained for specific future customers, such as to provide masts for large sailing boats. Such nuanced management is only possible when the manager retains flexibility within the framework of the management plan to vary harvest patterns – a flexibility denied the managers of large concessions in the tropics. Managers of community concessions, however, are likely to have intimate knowledge of their lands, potentially giving them a competitive advantage and enabling them to manage their small concession areas successfully.

A final consideration on the size of concessions relates to the impacts of corruption. Policymakers may be corruptly induced to allocate larger concessions (Amacher, Ollikainen and Koskela, 2012); on the other hand, the operation of smaller concessions may be susceptible to corruption (Delacote, 2010), leading to more rapid forest degradation.

### **Are community-held concessions more successful?**

In a global review of community forestry, Gilmour (2016) found that, particularly in developing countries, community forestry is based on “collaborative” models in which governments and communities share rights and responsibilities that are gradually devolved to communities. In most cases, this devolution of power has been slow or ineffective, and the number of cases with well-documented benefits is small.

In the Maya Biosphere Reserve it is clear that successful community concessions are those in which the communities involved have had a tradition of forestry and are working on lands known to them. The concessions that have failed have been those in which the concession-holders included a high proportion of recent arrivals from other parts of Guatemala. The failure of such concessions has been attributed to tenure uncertainty, land speculation, and pressure to deforest applied by powerful external actors and organized-crime syndicates to make way for cattle ranching (Radachowsky *et al.*, 2011).

There is evidence that transferring forest rights to local stakeholders leads to improvements in forest management and decreased deforestation rates (Porter-Bolland *et al.*, 2011; Bray *et al.*, 2008). In Mexico and Guatemala, community-managed forest areas have lower deforestation rates than protected areas close by (Bray *et al.*, 2008), although there is considerable variation between communities attributable partly to differences in deforestation pressure. Thus, in areas of high population density and high deforestation rates, community-managed forests are no better than formally protected areas in preventing deforestation.

In the United Republic of Tanzania, revised laws have enabled communities to achieve tenure rights over their forests and, where this has happened, communities have proved more effective than central authorities at encouraging forest regeneration (May Liana, 2013), as well as in protecting forest from fires, resulting in improved forest structure (Kalonga, Midtgaard and Eid, 2015). Moreover, in at least one instance, the transfer of forest ownership from central control to communities in the United Republic of Tanzania has resulted in a tenfold increase in timber-related income derived by communities (Kalonga, Kulindwa and Mshale, 2014). Nevertheless, the communities face significant challenges in securing the full potential value of their timber due to a lack of capital and a lack of knowledge and skills in processing timber and accessing markets.



In Cameroon, the rate of forest degradation appears to be higher in community-owned forests than in forests formally allocated to production (Bruggeman, Meyfroidt and Lambin, 2015). Where Cameroonian communities have achieved rights to manage their own forests, significant problems have arisen, for various reasons. In many cases, the forest area is too small and forest management plans too rudimentary to allow long-term harvest planning. The author has observed that, as a result, communities are unable to provide markets with a reliable supply of timber and are unable to respond adequately to orders from international buyers. Regulatory authorities are slow in issuing annual cutting permits, leaving communities with just a few weeks at the end of the season in which to harvest their allowable timber volumes. Management plans are produced by outsiders, with the effect that communities lack crucial knowledge about their resources and have little input into decision making on resource management. Ultimately, many villages simply sell their harvest allocations to outsiders seeking to launder timber harvested elsewhere.

Most tropical forest communities require significant assistance to develop the skills they need in, for example, forest management, governance, harvesting, processing, marketing and business management to manage their forests successfully for commercial benefit and to participate effectively in the value chain. Community-based concessions have the potential to deliver economic, social and environmental benefits and will often enable a fairer distribution of such benefits among stakeholders, but a lack of capital and human resources means it is unlikely that there will be a wholesale transfer of concessions from businesses to communities in the short term.

### HOW CAN FOREST CERTIFICATION HELP?

Forest certification has arisen since the 1990s and is based on two distinct but complementary pillars. One of these has been the development of standards for “responsible/sustainable” forest management capable of being applied at the level of the forest management unit. The second pillar is a system of certification by means of third-party inspection, which offers certificates to organizations able to demonstrate compliance with the standards. These certificates can be used to demonstrate compliance with market demands for ethically produced timber with the aims of increasing market share and achieving higher prices.

The question often asked about the impacts of forest certification would be better framed in terms of the impacts of compliance with internationally accepted forest management standards.

There have been numerous attempts to demonstrate the positive economic, social and environmental impacts of forest certification, but few have provided unequivocal proof. The lack of clear evidence is due most commonly to the existence of confounding explanations for observed changes (van Hensbergen *et al.*, 2011), such as when certification is packaged with the transfer of forest tenure rights (in which case the impacts may be due solely to the transfer of forest rights; Kalonga, Kulindwa and Mshale, 2014) or when certification is part of a development assistance support package (in which case the impacts may be due solely to development assistance).

Forest managers do not operate in isolation; thus, practices introduced in certified operations are likely to be adopted in uncertified operations if the benefits are clear. Similarly, government technical support programmes are likely to adopt standards in line with certification standards, with the net effect that improved practices are adopted more widely than in the certified operations where they were first implemented.

It is clear that the development and application of certification standards have changed the “playing field” significantly in terms of what is considered acceptable forestry practice. For example, locally adapted RIL is now a requirement in most new concession contracts, even though certification is not.

Although difficult to demonstrate unequivocally, it seems certain that certification has played an important role in increasing the adoption of responsible forest practices in concessions in line with forest certification standards. Moreover, such practices are more deeply embedded in organizations that have chosen to engage in certification (regardless of the certification system used).

The most unequivocal evidence on the impacts of certification is in the “corrective action requests” (CARs) made by forest certification auditors. Table 8 presents an analysis of CARs in natural tropical forests in concessions and forests under private ownership. It shows that there have been significant improvements as a result of certification, particularly in relation to worker safety, management planning and the use of RIL, and also in biodiversity protection. Interestingly, auditors regularly raise queries about the long-term economic viability of forest companies (Peña-Claros, Blommerde and Bongers, 2009), *prima facie* evidence that forest concessions in the tropics may not be as profitable as often assumed (Karsenty, 2015).

TABLE 8

**Corrective action requests requiring improved management in tropical forests certified by the Forest Stewardship Council**

Criterion	Description	Ranking	Distribution
4.2	Health and safety for employees and families	8.2	87
7.1	Management plan	6.7	79
6.5	Use of reduced impact logging techniques to reduce impacts in the forest	5.6	74
8.2	Monitoring of indicators, such as productivity, forest diversity and socio-economic impacts	4.8	76
5.6	Harvesting regulations to assure long-term sustainability	4.5	61
6.2	Rare, threatened and endangered species	4.0	73
8.3	Chain of custody	4.0	58
5.1	Economic viability	3.7	68
7.3	Training and supervision of forest workers to ensure implementation of the management plan	3.1	61
8.1	Frequency and intensity of monitoring	2.8	63

*Table 8 continues on next page*

Table 8 continued

Criterion	Description	Ranking	Distribution
6.1	Assessment of environmental impact	2.7	54
4.1	Communities are given employment, training, services	2.7	46
1.1	National and local laws	2.6	46
1.5	Protection from illegal activities	2.6	54
4.4	Evaluation of social impact	2.5	60
6.3	Ecological functions and values	2.4	55
2.3	Mechanism to solve disputes	2.3	44
6.4	Protected areas	2.1	44
6.7	Waste (garbage)	2.0	54
9.1	Define existence of high conservation forest values	1.9	52
2.2	Local communities maintain control or they delegate it	1.9	30
7.4	Public summary of management plan	1.8	57

Sources: Peña-Claros, Blommerde and Bongers, 2009.

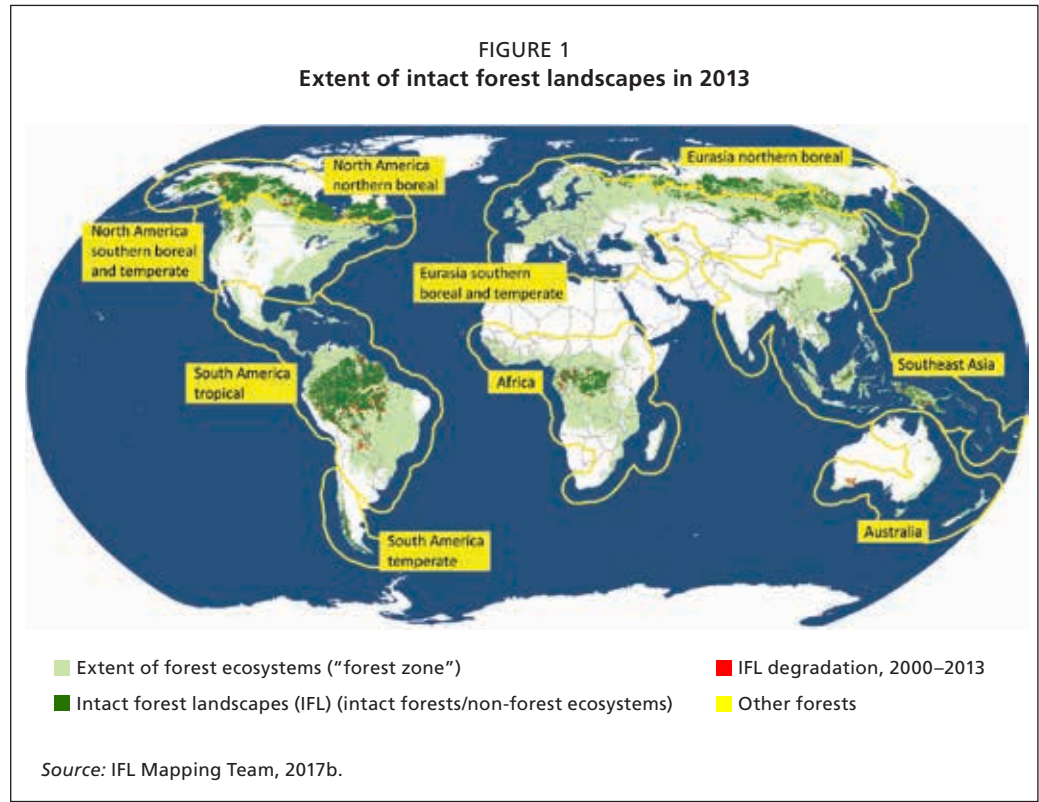
In African concessions, certification has had significant positive social and environmental impacts on the way in which certified companies conduct their businesses (Karsenty, 2015). Compared with uncertified companies, the social environment is significantly better (Cerutti *et al.*, 2014). There is a much greater degree of engagement with local communities and indigenous peoples in certified operations, and this has led to attempts by certified companies to carry out FPIC processes with communities and to better compensate customary rightsholders.

There is evidence that certification can help reduce deforestation and that this effect is stronger in tropical regions (Damette and Delacote, 2011), where the Forest Stewardship Council (FSC) certification scheme is much more prevalent than the Programme for the Endorsement of Forest Certification. It should be noted that evidence for this was derived from a correlational study using information for entire countries, and it may be that those countries achieving greater policy success in combating deforestation are also those in which forest businesses are more likely to seek certification.

A little-discussed aspect of forest certification is that the certification process requires much greater transparency than is common in tropical forest businesses. Such increased transparency is expected to lead to a higher level of accountability among forest managers and associated parties, which, in turn, should create more positive social and environmental impacts (Fox, 2007). A supposed strength of certification is the public availability of certification audit reports, which indicate the level of a company's compliance with the certification scheme's standards. Some people hope that forest certification can be used as a tool to reduce corruption associated with tropical forests; there is little evidence that this has occurred, however, and it is unlikely that forest certification on its own can fulfil this role (Søreide and Williams, 2013).

Intact forest landscapes

Intact forest landscapes (IFLs) are defined as forest areas largely free of human influence with an area of at least 50 000 hectares and a minimum width of 10 km (IFL Mapping Team, 2017a). Such areas are the target of protection actions by environmental NGOs such as Greenpeace and the World Wide Fund for Nature (WWF). At the FSC General Assembly in 2014, members voted to accept motion 65, which seeks to protect significant areas of IFL from commercial harvesting (FSC, 2014). Under this motion, FSC certificate-holders will be required to set aside large areas (a default level of 80 percent) of IFLs in their forest management units and to protect them from harvesting and other forms of degradation. This development is likely to have significant impacts on concessions in those parts of the world where IFLs (Figure 1) and concession systems coexist – including large areas of the Congo Basin, the Amazon, Borneo and New Guinea in the tropics and Canada and the Russian Federation in the boreal zone.



The decision on IFLs by the FSC General Assembly poses a range of challenges for certified concession-holders, who could lose significant proportions of their harvest potential. The delineation of IFLs at the local level could lead FSC-certified organizations to seek larger forest concessions in order to remain viable while complying with certification demands. There is also a risk that existing certificate-holders will

abandon operations or sell them to uncertified operators and that certified organizations will be unable to compete with uncertified companies when tendering for concessions.

It is important, therefore, that governments develop policies on IFL and concessions to achieve a level playing field and thereby ensure they remain able to attract responsible concession-holders.

### WHAT HAVE TROPICAL FOREST CONCESSIONS ACHIEVED?

If, as suggested earlier, the objective of tropical forest concession systems is to deploy forest capital for societal benefit, their history is a sad one – at least in the period 1945–2000. Forest concessions have been operating in many of the world’s poorest nations for decades, and there is little evidence that they have contributed much to development. In most cases, forest-dependent people remain among the poorest of the poor (Scherr, White and Kaimowitz, 2003).

The failure of concession systems in the tropics to significantly improve livelihoods has often been accompanied by significant forest degradation and loss. Concessions are not necessarily solely or directly responsible for forest loss; it is clear, however, that their failure to protect forests has permitted such losses to occur. Moreover, the repeated “creaming” of forests under various pretexts has resulted in large areas of forest today that contain little timber of commercial interest.

Towards the end of the twentieth century there was a significant change in the objectives of forest concessions in general – away from concessions designed almost solely for the purpose of generating government revenue by harvesting existing trees towards concessions in which responsibility for some or all aspects of forest management are transferred to concession-holders. If these responsibilities are taken seriously and the necessary forest management activities take place, such concessions may be expected to lead to increases in the economic, social and environmental value of forest resources.

It is sometimes suggested that the failure of concession-holders to generate significant local value is because tropical forestry (particularly in Africa) is not especially profitable (Karsenty, 2015) and there is little value to share with local stakeholders and governments.<sup>6</sup> There is evidence, however, that some concessions have benefited local communities in various ways (Gretzinger, 2015), including by increasing skills; enabling the development of local small entrepreneurs and suppliers; assisting communities in obtaining forest tenure; and building capacities in negotiating with customers and regulatory authorities.

In at least some countries, there have been significant improvements in the quality and quantity of employment as well as in health and safety and the provision of adequate personal protective equipment, most likely associated with the requirements of certification schemes. In some areas, the implementation of significant value-adding activities has increased in-country employment and value capture

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<sup>6</sup> As noted elsewhere in this report, however, there is evidence that informal payments for regulatory permissions account for a large proportion of the in-country value of forest concessions and that transfer pricing has been used to hide the true export value of timber products.







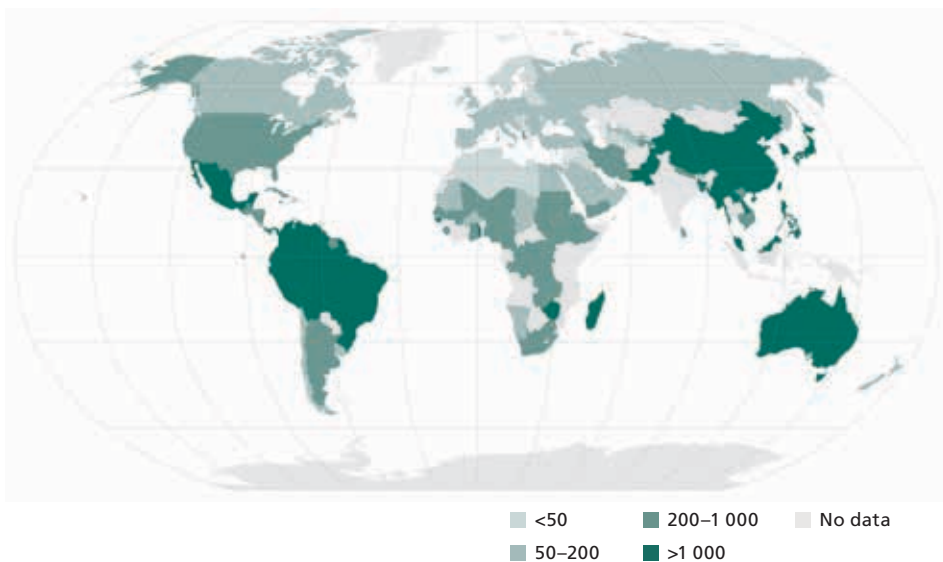
### 3 Why is tropical forestry so difficult?

The tropical timber reaching markets in developed countries is generally significantly more expensive than similar timbers from temperate forests – even though timber has often been seen as a free good and large volumes are taken that are not officially paid for in source countries. To justify the price premiums on tropical timber in competitive markets, tropical forest must involve significant difficulties that lead to increased costs along the value chain. Some of these are discussed below.

#### THE DIVERSITY DILEMMA

Tropical forests are significantly more diverse than temperate forests (Figure 2) (Barthlott *et al.*, 2005). For example, a single hectare in a Malaysian forest contains more than 250 tree species (Suratman, 2012); on the other hand, a hectare of temperate production forest is unlikely to contain more than 20 tree species. The density of individuals per species in a given area of tropical forest is also likely to be low (1–2/ha) (Suratman, 2012), often resulting in a low density of trees of commercial interest.

FIGURE 2  
Number of native forest tree species, by country



Source: FAO, 2005.

In practice, commercially valuable timber volumes vary by region. In Southeast Asia, dipterocarp forests have sufficiently high standing volumes of commercial timber to encourage forest clearfelling under the pretext of future agricultural development (Chan, 2015). In Borneo, first-entry harvest volumes in concessions can be as high as 80 m<sup>3</sup>/ha under traditional (i.e. high-volume) extraction methods, and extractions of 50 m<sup>3</sup>/ha are usual (van Gardingen *et al.*, 2003). In Brazil, the average yield of commercial timber in each harvest cycle is about 13 m<sup>3</sup>/ha (Gretzinger, 2015); in Africa, volumes of 4–5 m<sup>3</sup>/ha are usual (Karsenty, 2015). In none of these regions can harvest rates be sustained under current management practices (see below).

### FOREST MANAGEMENT PLANNING

All forest management plans seen by the author for tropical forests in concessions in Africa and Latin America are missing a crucial aspect of the management cycle – long-term objectives for the tree resource. The most comprehensive plans address, in detail, proper access and harvesting; RIL; biodiversity management planning based on the comprehensive identification of areas with high conservation value and set-asides; the identification of social impacts; measures for mitigating negative social and environmental impacts; and other aspects. But none includes plans for the renewal of the resource based on a vision of future requirements for timber and other forest resources (von Gadow *et al.*, 2007). Following commercial harvest, forests are simply left to “recover”, even though it is well understood that such recovery will result in a forest that differs significantly from the pre-harvest state in terms of the distribution of commercially desirable species (Karsenty and Gourlet-Fleury, 2006). In effect, the history of tropical forest management based on minimum felling diameters is a history of sequential economic extinction of desirable species (Kometter *et al.*, 2004). Partly this is due to illegal overharvesting, but the system itself would ultimately produce the same result because harvested trees are less likely to be replaced in the canopy by conspecifics due to intraspecific competition (Fibich *et al.*, 2016).

Although there has been significant improvement in understanding the ecology of some tropical forest species, such as mahogany (*Swietenia macrophylla*) (Grogan *et al.*, 2014), this has only rarely been translated into management recommendations. Moreover, recommendations often fail to take into account regional ecological differences in tree life-history processes (Grogan *et al.*, 2014).

For mahogany harvesting in the Brazilian Amazon to become sustainable in the next century, there needs to be an increase in the number of trees of harvestable size retained in stands as well as a significant increase in investment in silviculture to promote mahogany regeneration. Such a change in management would have a considerable impact on the financial viability of mahogany harvesting by reducing income and increasing costs.

The situation for mahogany is similar to that in forests in Asia (van Gardingen *et al.*, 2003) and Africa (Karsenty and Gourlet-Fleury, 2006), where significant changes in management and increases in silvicultural investment are required to attain sustainability. On the other hand, there is potential to increase the recovery of wood in the forest and thereby increase incomes: harvest efficiency is low in most tropical timber operations

(see photo), with poor log-bucking practices leading to the abandonment in the field of considerable volumes of felled timber (Gerwing, Johns and Vidal, 1996).



*A log abandoned in a concession in Cameroon for being too short (< 3 m)*

## TROPICAL FOREST SILVICULTURE

Silvicultural techniques are rarely applied in natural forest management in the tropics due to perceived high costs and poor returns as well as a lack of knowledge on the impacts of specific activities. Silvicultural interventions can increase both the quantity and quality of the timber produced, however, and there is growing evidence that both these factors can be important for ensuring that silviculture is economically viable and environmentally acceptable (Günter *et al.*, 2011).

A range of silvicultural interventions has been carried out in tropical forests, such as enrichment planting under canopies and in gaps; soil scarification; early weeding; competitor removal; selective thinning; and creeper cutting.

Competitor removal and thinning can enhance growth rates: for example, it can potentially increase annual diameter increment by more than 30 percent in Bolivian tropical forests (Mostacedo *et al.*, 2009). Studies have demonstrated the effectiveness of planting desirable species in the canopy gaps generated by harvesting (known as enrichment planting) in both Latin American and African forests; moreover, higher growth and survival rates can be achieved by using nursery-prepared material for enrichment planting (Doucet *et al.*, 2009; Lopes, Jennings and Matni, 2008).

A financial analysis by Schwartz *et al.* (2016) showed that a combination of methods can achieve positive outcomes for silvicultural interventions, even with a 60-year return period. Thus, a silvicultural approach will, in most circumstances, outperform situations in which RIL is used but not followed up with silvicultural interventions. A silvicultural

approach also helps maintain biodiversity by planting tree species whose numbers have been reduced significantly by harvesting.

When required by contract, law or company CSR policies, silvicultural activities such as enrichment planting, site clearing and weeding rarely receive the attention they require from forest managers. As a result, they are often done poorly and not subject to the same efficiency checks as other parts of the business. If, rather, they were seen as integral to the business it is likely such silvicultural practices would be better implemented, with the benefit of reducing costs and thereby increasing profitability. On the other hand, long-term investment requires long-term tenure security (Schwartz *et al.*, 2016).

## ECONOMICS OF TROPICAL FOREST MANAGEMENT

The relatively low density of commercially desirable species in tropical forests is associated with higher costs per unit volume extracted.<sup>7</sup> There are also other reasons why the costs of production might be higher in tropical forests than in temperate ones, including the following:<sup>8</sup>

- difficulty of access due to terrain, soils and moisture;
- poor transport infrastructure, leading to high transport costs;
- the high cost of informal payments;
- longer distances to processing facilities and ports;
- low worker productivity; and
- larger and heavier trees, which are more expensive to extract.

Thus, roundwood harvested in tropical forests should be significantly more expensive than roundwood harvested in temperate forests. In Liberia, for example, the cost of extraction (USD 60/m<sup>3</sup>), transport to port (USD 40/m<sup>3</sup>) and administration (USD 15/m<sup>3</sup>) equates to a log cost in the export harbour of USD 115/m<sup>3</sup>; in addition, the government seeks to extract rent in excess of 50 percent of the log price. Log prices of USD 170/m<sup>3</sup>, however, make the operation commercially unviable (IBI Consultants, 2013).

Transport is a key limiting factor in the timber industry in developing countries because of its high cost and low quality. Transport costs are much higher in Central Africa than in France, for example: in 2007, the cost of transport was USD 0.12/tonne/km in Central Africa and USD 0.05/tonne/km in France, adding USD 7 per tonne to the cost in Central Africa (relative to the cost in France) for a transport distance of 100 km from forest to port (Teravaninthorn and Raballand, 2008).

Variable costs are a much higher proportion of transport costs in African developing countries than in Europe (Teravaninthorn and Raballand, 2008). This is due partly to the lower cost of the second-hand trucks that form the bulk of the African fleet and partly to the higher operational costs caused by poor road conditions, which mean slower movement and higher repair costs. Thus, improving transport infrastructure would help reduce costs and thereby increase the number of species that are economically viable.

<sup>7</sup> Generally, higher volumes are harvested per hectare in Asian dipterocarp forest than in other tropical forests.

<sup>8</sup> Particularly when comparing timber concessions.

The local processing of timber would also significantly reduce the cost of transport as a proportion of final product cost. For example, a transport cost of USD 12/tonne is 6 percent of the value of a log priced at USD 200/tonne but only 2 percent of a load of sawnwood priced at USD 600/tonne.

In many cases, forest operations are only economically viable for the extraction of the highest-value species. Permitted species for which there is commercial demand but a relatively low price may not be extracted because the cost of extraction outweighs the obtainable price (IBI Consultants, 2013).

It is often considered that operators in tropical forests make excessive profits through a variety of mechanisms, including transfer pricing. If this were generally true, it should be reflected in a price differential between temperate and tropical logs.

Information on log and timber pricing is difficult to obtain because of secrecy around suppliers and customers in timber value chains (Poynton, 2015). Table 9 presents price information for logs and boards for several temperate and tropical species collected from various sources. There can be a wide range of prices for a given species according to the “quality” of the timber product: an attempt has been made in Table 9 to correct for this by presenting prices for grade A sawlogs and not veneer grade and by selecting board products with dimensions as close to 25 mm x 150 mm x 2.4 m as possible and of free-alongside (FAS) quality. Board prices are retail prices with large volume discounts and apply to volumes of approximately 1 m<sup>3</sup>. The figures shown in Table 9 are averages of a number of prices, which may be highly variable. For example, the price range for boards of plantation teak in Europe is USD 6 000–18 000/m<sup>3</sup>. It should be noted that the log price indicated for ash has been strongly biased upward by a single price offer of more than USD 1 800/m<sup>3</sup> for a parcel of logs in the United Kingdom of Great Britain and Northern Ireland (which was much higher than ash log prices in France and Sweden).

TABLE 9

**Costs of logs in countries of origin and selling prices of boards in Europe for a range of hardwood species**

	Board in Europe (USD/m <sup>3</sup> )	Logs in source region (USD/m <sup>3</sup> )	Value of roundwood as a proportion of board value (%)
Ash	3 689	682	18
Beech	3 482	170	5
Oak, European	4 582	235	5
Oak, American white	3 547	296	8
Iroko	4 356	325	7
Padouk	4 519	319	7
Sapele	5 259	342	7
Wenge	9 692	473	5
Mahogany	6 988	253	4
Meranti	2 933	188	6
Teak	12 973	500	4

Notes: This information is derived from an extensive search of published prices over the period 2013–2016. As far as possible, prices for boards are for boards of FAS quality of dimensions 25 mm x 150 mm x 2.4 m. Values are average of all values obtained.

Table 9 shows that, despite the wide range of prices for different species and the different origins of the temperate and tropical species, there is remarkable congruence in log price as a proportion of board price (in the range of 4–8 percent). There is no obvious difference in this proportion by origin (but it should be noted that although the origin of the timber is known, it is unknown whether the prices in the table refer to timber processed in the country of origin or elsewhere).

This finding suggests that there is no systematic market failure in the pricing of tropical timber compared with that for temperate timber, at least for these well-known species. It is also known, however, that there is a large amount of illegal harvesting involving the non-payment of royalties, which reduces the costs for at least some operators.

There are some interesting variations by species. Although teak sells for a minimum of USD 6 000/m<sup>3</sup> in Europe, plantation teak boards are available in India and China for USD 2 397/m<sup>3</sup> and USD 4 588/m<sup>3</sup>, respectively. This may be because of differences in market specifications, particularly in terms of the allowable extent of sapwood in boards.

It is clear from a range of sources (e.g. Gretzinger, 2015; Karsenty, 2015) that harvesting in natural forests is not as profitable as might be imagined, particularly if operators work in full compliance with the law. The many unworked or abandoned concessions in the tropics provide prima facie evidence of this. It is likely, however, that the lack of profitability is often due to transfer pricing. There is good evidence for this practice in Papua New Guinea, where average free-on-board log prices are significantly below world averages and companies systematically make losses (Mousseau and Lau, 2016).

It is also clear that unmanaged tropical forests with growth rates of commercially interesting species of 0.1 m<sup>3</sup>/ha/year producing a log value increment of USD 20–40/ha/year cannot compete with temperate forests. In the latter, the commercial increment in mixed species stands can exceed 5 m<sup>3</sup>/ha/year and, in stands of single species (e.g. beech), it can exceed 10 m<sup>3</sup>/ha/year – amounting to annual log value increments of USD 1 000/ha/year. Unmanaged tropical forests also cannot compete with other tropical land uses such as oil palm, which can produce annual returns of USD 1 000–3 000/ha.

PES schemes could make a significant difference to the profitability of tropical forest operations. However, in Bolivia (Plurinational State of) and Brazil, for example, the rights to carbon credits are not parcelled out with concessions but, rather, are retained by government (Gretzinger, 2015). It is also possible that restrictions placed on forest management to ensure compliance with carbon schemes will reduce the profitability of timber operations.

Although there is no evidence of systematic market failure, considerable opportunity exists to improve the efficiency of markets by improving market communication, thereby ensuring the optimal use of the timber supply. Currently, middlemen make their profits by arbitrage on timber prices but add little value. By better matching customer needs with supplier capacity, middlemen could increase their own revenues while also benefiting customers and suppliers.





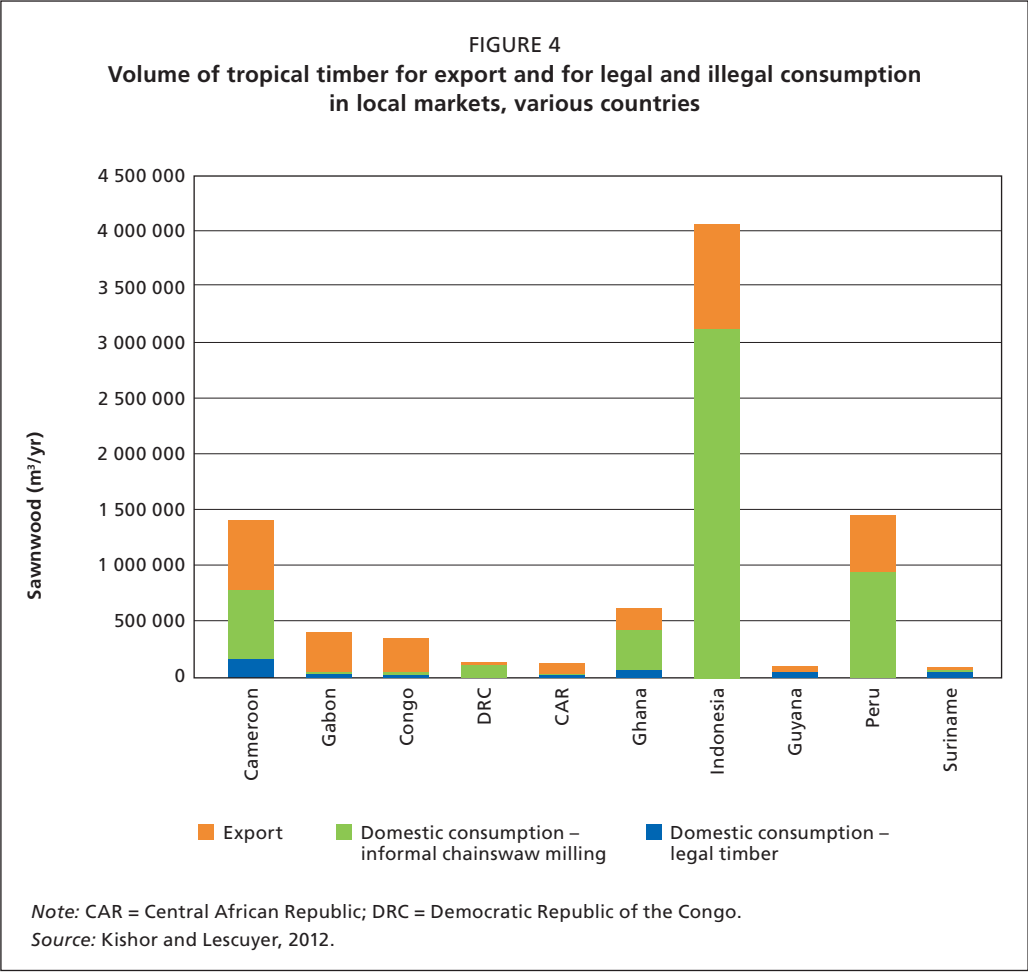
TABLE 10  
Quantities of timber required for a range of products

Type of user	Unit volume conversion	Typical annual demand (m <sup>3</sup> )
Specialist furniture manufacturer	20–50 chairs/m <sup>3</sup> , 10 tables/m <sup>3</sup> , 3 dressers/m <sup>3</sup>	1–10 m <sup>3</sup> /year
Larger mass-market furniture manufacturer	20–50 chairs/m <sup>3</sup> , 10 tables/m <sup>3</sup> , 3 dressers/m <sup>3</sup>	50–1 000 m <sup>3</sup> /year
High-end windows and doors	10–20 doors/m <sup>3</sup> , 50–100 window frames/m <sup>3</sup>	50–200 m <sup>3</sup> /year
Yacht decking	0.5–1 m <sup>3</sup> /yacht	50–100 m <sup>3</sup> /year
Engineered wood flooring	150 m <sup>2</sup> flooring/m <sup>3</sup> : typical house (0.5–1 m <sup>3</sup> ), hotel (10–20 m <sup>3</sup> )	300–700 m <sup>3</sup> /year
Low-volume kitchen cabinet door range for large do-it-yourself chain	50–70 doors/m <sup>3</sup>	300 m <sup>3</sup> /year
Small-scale guitar-maker	200–300 guitars/m <sup>3</sup>	Less than 1 m <sup>3</sup> /year
Large-scale guitar-maker	200–300 guitars/m <sup>3</sup>	1–100 m <sup>3</sup> /year

There is a problem in introducing new species to markets related to the cost of market development. Many species may exist with appropriate technical properties for a particular use, but only some are also visually attractive. Even when a species meets all requirements for a purpose, if it is unknown in the market it will be difficult to persuade manufacturers to use it in their processes as long as the usual alternative is in good supply. Several million dollars are likely to be required to launch a new species onto the market in competition with others; to make such an investment would require an assured market and a log supply worth perhaps USD 20 million. It may be necessary to sell the logs of a “new” species at a low price to attract customers. If this low price is USD 200/m<sup>3</sup>, it would be necessary to sell 100 000 m<sup>3</sup> (to achieve total sales of USD 20 million) to make it worth the cost of bringing the new species to market. For a single commercial entity to achieve this volume in a three-year period (given a desire for a return on marketing investment of 30 percent per year), a concession of almost 1 million hectares harvested on a 30-year rotation would be required.

Thus, although a forest may contain 30–40 species of potential commercial value, only 6–7 of these are likely to be in commercial use at any one time. Customers will only start searching for alternatives when the supply of a particular species approaches economic extinction. The search for new species is demand-led, therefore, not producer-led.

In many countries, the volumes traded in domestic and regional markets exceed the volumes traded globally (Figure 4) (Kishor and Lescuyer, 2012). The illegal nature of many domestic and regional markets (see below) has the effect of depressing local timber prices because actors rarely pay mandated charges and taxes, making it difficult for legal operators to compete successfully in local markets. Given their size, informal markets are crucial for the future of forest management in Africa, where they are a significant source of employment but have largely been ignored by policymakers (Cerutti, 2015).



### WHY HAVE GOVERNMENTS FAILED TO KEEP VALUE IN-COUNTRY?

Forestry and associated processing activities are highly capital-intensive, requiring equipment that is not manufactured in developing countries. There is, therefore, a large capital outflow associated with forestry investments that is only recovered after several years (where capital costs are met by expatriate investors, they are balanced by capital inflows).

In the past, the industry was characterized by the large-scale export, for processing, of low-value roundwood to other markets. In an attempt to retain more value in-country, a number of governments have instituted log export bans requiring a certain minimum amount of processing before export. In many cases, businesses have attempted to circumvent such restrictions by minimal processing in a “red queen” game in which governments impose ever more stringent restrictions to offset attempts to avoid restrictions.

Ghana has had a log export ban since 1994, and at least some processors have engaged in high-added-value activities such as the production of veneers and mouldings. Mozambique established selective log export bans in the 1990s and has had some success in developing

markets for species not covered by the ban. The country's early experience, however, was of value-subtracted processing (A. Issufo, personal communication, 1999) of the kind that has also occurred recently in Gabon (Karsenty, 2015), under which exported sawnwood is sold at a lower price than sawlogs (Mackenzie, 2006).

Some countries where log export bans have been in force have had leaky borders, with large-scale exports of roundwood; this has occurred, for example, in the Lao People's Democratic Republic (Chan, 2015), Cambodia (Zhang, Bampton and van Hensbergen, 2015) and Zambia (van Hensbergen and Njovu, 2015). Illegal loggers in Cambodia have developed their own road network for crossing borders to avoid passing through customs controls; the same situation exists on the border between Zambia and the United Republic of Tanzania.

The effect of the log export ban in Gabon has been to reduce the volume and value of timber exports and to reduce governmental direct revenue because a tax was previously levied on export logs. A process of restructuring has been ongoing since the ban, but installed processing capacity is only now reaching a level equivalent to the volume of logs previously exported (Karsenty, 2015). Therefore, there have been significant short-term losses of both revenue and foreign exchange.

Government revenues are based on a range of levied charges, which differ from country to country. Regardless of the types of charges, the major factor limiting government revenue has been an inability to collect payments. One study in Cambodia, which has a highly complex system of charges, found that only 10 percent of expected revenues was collected (Sophanarith *et al.*, 2006). In Liberia, where a significant proportion of charges are area-based, companies have sought to renegotiate charges after concession contracts have been signed and have withheld payments amounting to more than 95 percent of the value owed while continuing to operate (Dorbor Jallah *et al.*, 2012).

An inability to enforce contract-based charges is closely linked to an inability to enforce contractual requirements on forest management and to apply fines and penalties associated with illegal logging. Poor governance and a lack of transparency, coupled with a lack of capacity, are major issues (REM, 2009).

In some cases, transfer pricing has been used to transfer timber value out of countries (Contreras-Hermosilla, 2002). Companies may also transfer profits to other jurisdictions by overcharging for imported equipment supplied by related companies.

## POOR INDUSTRIAL PERFORMANCE

Many sawmills in tropical countries are equipped with old-fashioned and often worn-out equipment incapable of sawing accurately, resulting in very poor efficiency in converting roundwood to sawnwood. Moreover, the high level of sawing inaccuracy increases demand from customers for overmeasure in order to secure minimum dimensions, compared with timber that is sawn accurately. Saw blades are frequently much thicker than they need to be, so significant volumes are lost as sawdust during sawing. Drying is often poorly controlled, both in open-air seasoning and kiln drying, resulting in further losses due to deformation and cracking. It is rare for the efficiency of converting roundwood to sawn products to exceed 30 percent in tropical sawmills.

The situation is exacerbated by market demand for standard dimensions of defect-free timber. These dimensions are often much larger and longer than required by end users, resulting in the rejection of large volumes of useful timber.

Old, poorly maintained and inefficient equipment is a significant consumer of electricity, often consuming five times more than modern, well-maintained equipment performing the same job. In countries with high energy costs (e.g. Ghana), low energy efficiency can mean the difference between a profitable and a loss-making business. In one case in Ghana, it was observed that a large saw consuming 54 kW of electricity was used for a job that could have been done by a smaller saw using 9 kW, which would have resulted in a saving of USD 15 per operating hour. This saving alone would have paid for the smaller saw in less than one year.

A few businesses have succeeded in developing markets for small-dimensioned timber and value-added products such as mouldings and veneered boards, and this can increase the efficiency of conversion from roundwood to final products to above 60 percent. These businesses are large and secure employers and contribute significantly to local economic development.

The potential competitive advantages arising from improved efficiency in forests and sawmills begs the question why more cutting-edge investors are not prepared to take concessions.

## **TROPICAL FORESTRY AND SELF-REGULATION**

In temperate areas, privately owned and, in many cases, state-owned forestry is regulated according to a vision of long-term returns (“intergenerational forestry”). Why is this difficult to achieve in the tropics?

It is commonly argued that most concession-holders in tropical forests fail to achieve sustainability because of overharvesting – which reduces the future value of the forest – and a failure to apply silviculture that would ensure the regeneration of harvested species. It has also been argued that excessive area-based fees induce concession-holders to reduce rotation lengths (Boscolo and Vincent, 2007) and thereby overharvest.

Many people believe that the major problem relates to tenure – if concession-holders could obtain greater tenure security they would be prepared to make the necessary investments. There are two aspects to providing such security: 1) governments may issue tenure for fixed periods without a guarantee of renewal – this approach provides companies with little incentive to invest or incur costs in implementing activities that might provide them with little future benefit; and 2) many countries have lacked political stability and there is a high perceived risk of war or of arbitrary denial of tenure.

The first of these aspects may lead concession-holders to reduce their level of investment or compliance with contractual requirements towards the end of contracts, and the second may cause investors to seek very high rates of return on capital – up to 30 percent per year is common in developing countries.

It may be that greater contractual tenure security will increase the propensity of investors to manage forests for future benefits, but the existence of the second type of risk means that investors will continue to seek very high rates of return. In any case,

the return on investment is related to the rate of increase in the value of the resource; when this rate falls below the opportunity cost, rational investors will liquidate the resource and seek other investments (Grut, Gray and Egli, 1991); this would occur even if the investor owned the resource outright and had perfect tenure security. The only way to counter this behaviour would be by external regulation, but there is little reason to believe that governments would be more successful at enforcing regulations for which they obtain no reward than they have been at collecting forest revenues for which there is significant reward – investment in the collection of forest revenues is one of the best investments (in terms of rate of return) that a government could make (Grut, Gray and Egli, 1991).

### ILLEGALITY AND CORRUPTION

In many tropical forest countries, a large proportion of timber is channelled through the informal (illegal) sector (Karsenty, 2015; Amacher, 2006), destined mainly for internal markets (Karsenty, 2015) or neighbouring countries. For example, most tropical hardwood timber in the market in Kigali, Rwanda, is sourced illegally in the Democratic Republic of the Congo, while almost all timber on sale in the Buseko market in Lusaka, Zambia (see photo), is sourced informally/illegally inside the country (van Hensbergen and Njovu, 2015).



*Informally/illegally harvested rosewood and other hardwood logs in Buseko market, Lusaka, Zambia*



It is important to distinguish between illegality and corruption. An illegal act in forestry is any act that contravenes the laws and regulations governing forestry, the processing of forest products or the trade of forest products. Corruption, on the other hand, involves the use of public office for private gain (Smith *et al.*, 2003). In most jurisdictions, corruption itself is an illegal act; in the forest sector it is also associated with other illegal activities. Considerable corruption occurs around delays in authorizing legal forest operations, in which case corrupt payments are paid to expedite permission. Where illegality is combined with corruption, the impacts become catastrophic for development and for forests.

Forest illegality has many forms (Amacher, 2006; Contreras-Hermosilla, 2002), which may be grouped loosely into the following categories:

- Illegally harvesting timber
  - Harvesting outside an area for which a valid permit is held
  - Harvesting without a permit
  - Harvesting species to which there is no entitlement
  - Harvesting trees not included in the allocated yield
  - Harvesting dimensions for which there is no entitlement
  - Harvesting for a purpose for which there is no entitlement (e.g. communities harvesting under a legal exemption for “own use” and then selling commercially).
- Misrepresentation
  - Underdeclaration of harvested volume
  - Misdeclaration of species harvested
  - Misdeclaration of timber values or undergrading
  - Use or reuse of permits and permissions for an alternative purpose.
- Illegal transport and trade
  - Transport without permits or payment of fees
  - Illegal export of timber or logs
  - Transfer pricing.
- Illegal acquisition of forest or land tenure
  - Land invasion
  - Misrepresentation in the acquisition of forest tenure
  - Failure to comply with legal obligations associated with forest tenure.
- Corruption
  - Petty corruption associated with regulatory and bureaucratic requirements
  - Petty corruption associated with any other illegalities
  - Grand corruption associated with the allocation of forest tenure
  - Grand corruption associated with the trade of timber products.

### Causes of illegality

Some illegality associated with forestry can be ascribed to the prohibition of traditional activities under various pretexts (Fairhead and Leach, 1996), often based on the appropriation by central governments of customary tenure and often originating in the colonial period. For a long time in Guinea, for example, the setting of fires in savannah – a traditional agricultural activity – carried the death penalty (Fairhead and Leach, 1996).

In other cases, illegality is associated with extreme poverty, and illegal activities are carried out simply to survive. This is true in many countries where timber is harvested illegally for the artisanal production of charcoal for sale in urban centres.

In many tropical countries, production forests are remote and difficult to access; as a result, there is an almost complete lack of law enforcement capacity.

Illegal activities are often so ingrained in forest practices that their cause can only be ascribed today to tradition. In Ghana, for example, it is standard practice to undermeasure logs by 20 percent as a way of decreasing stumpage payments. Those involved do not consider such illegal behaviour as questionable.

When the salaries of forest officers are far below the minimum required for subsistence, it is not surprising that petty corruption involving payments for ignoring illegal activities is widespread. A culture of this type of corruption is difficult to break because it affects the entire system, and even officers not directly involved may incur guilt if they fail to report corrupt practices, thereby making them vulnerable to becoming corrupt. On the other hand, simply increasing salaries is unlikely to be a quick cure for this type of corruption (Amacher, Ollikainen and Koskela, 2012).

At the other end of the scale, illegality may involve the allocation of forest tenure, transfer pricing, false accounting and other practices, which are almost always associated with some form of illegality and may also involve collusion between senior officials and businesses (Amacher, 2006). In many cases, it is impossible to obtain forest allocations without resorting to corruption. This type of corruption may be associated with perceptions of entitlement among high-level government officials (Messner, 1981).

In many countries, informal payments – often in the range of USD 60–100/m<sup>3</sup> – constitute the highest single cost of forestry businesses (Contreras-Hermosilla, 2002). It can be argued that the complexity of forest regulations in some countries is intentional because it facilitates corrupt rent-seeking practices by officials (Contreras-Hermosilla, 2002).

### **Impacts of illegality**

Illegal actions deny the rightful beneficiaries – such as governments and local communities – benefits from forests to which they are entitled. The losses of government revenue, both nationally and globally, associated with forest illegality are estimated to involve substantial amounts – as high as billions of US dollars in some countries (Contreras-Hermosilla, 2002).

Illegality criminalizes those who participate in illegal activities. This might seem to be a desirable outcome on the surface but might not always be the case. For example, large proportions of rural populations in countries such as Kenya, the United Republic of Tanzania and Zambia are dependent on illegal charcoal production as a means of survival: criminalizing entire populations should not be a desired outcome of a law. Laws are based on a “social contract” between governments and the governed: where laws are so widely disobeyed as to be meaningless, there is clearly no such social contract.

Another important aspect of informal/illegal production must be highlighted. Informal producers do not usually pay for their wood, simply extracting it from the

forest according to their needs and capacities. Such producers also avoid regulatory and personal taxes by operating in a cash economy. For this reason, they are often able to produce timber at far lower prices than formal producers and concession-holders. This has the effect of bringing down the market price of timber in a country and making it difficult or impossible for formal producers to compete.

### **Impacts of corruption**

Corruption has a range of negative impacts. Where it exists in concession systems, it means that governments do not obtain optimal rents from concession-holders because large portions of those rents are collected elsewhere in the value chain and do not return to government. This behaviour is unlikely to be economically efficient because of the time spent in rent collection and in covering up corruption – time that otherwise could have been spent on productive activities.

More importantly, however, the existence of corruption means that almost all other policy instruments become ineffective because there is no mechanism for enforcing them. When a corrupt action takes place, both parties become guilty of involvement in it and penalties designed to ensure enforcement of policy aspects become ineffective. Thus, it is much more difficult in a corrupt environment to design and enforce policies that will ensure economic development and forest conservation (Amacher, Ollikainen and Koskela, 2012). The counterargument that, in the face of impossible regulatory demands, corruption is the “grease that lubricates the wheels of development” has been discredited (Contreras-Hermosilla, 2002).

Eliminating corruption and its associated illegality is not easy. Policy development must take into account the existence of illegality and ensure that, in the long term, illegality and corruption cease to be optimal strategies for government officials.





# 4 The future of concessions

Many of the problems associated with concessions concern forest management and not the concession system itself. Any attempt to correct the situation in tropical forests using concessions as a policy instrument must first address the problems with forest management. External conditions, including concession-system governance, also affect the feasibility of good forest management.

## SCENARIOS FOR THE FUTURE OF TROPICAL FOREST MANAGEMENT

Tropical forests continue to decline in area and integrity in large parts of the world for a variety of reasons (WWF, 2015). Of the 11 major deforestation fronts identified by WWF, only one lies (partly) outside the tropics (WWF, 2015).

In many cases, the ultimate reason why forests are not protected is that they are not perceived as offering sufficient value in the face of land-use alternatives. In a few cases, they are perceived to have such high timber value that it is best to cut them (legally or illegally) before someone else does.

The biggest cause of deforestation is the conversion of land for small-scale informal and large-scale industrial agriculture. If forests are to survive, their capacity to generate value streams that are competitive (in the eyes of local stakeholders maintaining de facto control over the resources) must be demonstrated.

TABLE 11  
Scenarios for tropical forest management

Timber business status quo	
Forest management \ Governance	<div>Status quo</div> <div>Improved</div>
Status quo	<div>Forest loss benefits a corrupt elite</div> <div>Forest management without development – the “forest poverty trap”</div>
Improved	<div>Forest loss with negligible benefit</div> <div>Low-value forestry – the “eternal forest poor”</div>

Improved timber business	
Forest management \ Governance	<div>Status quo</div> <div>Improved</div>
Status quo	<div>Commercial extinction of forests for the benefit of a few</div> <div>Sustainable forestry for the benefit of a few</div>
Improved	<div>Short-term benefits for all, leading to a loss of forest capital</div> <div>Sustainable forestry with local development and valued forests – the “new forest rich”</div>

For forest concessions to be sustainable, significant improvements are needed in three aspects: 1) governance; 2) forest management; and 3) the timber business model. In a successful business model, forests are well managed and able to provide an assured flow of all resources; the tenure rights to the resources are allocated within a framework of good governance that allows businesses to operate with the minimum possible interference and without corruption; and forest products are processed efficiently into high-value goods that return significant value to the forest. Such a business model is not yet fully implemented anywhere. Few tropical forests are adequately managed – for the most part, they exist in an environment of deficient governance, and business models are generally suboptimal and unsustainable.

Table 11 presents possible outcomes for various scenarios, depending on the types of improvements made. Note that the table applies to all tropical forest management situations, not just concessions.

### **Improved forest management**

Maintaining and increasing forest productivity and forest values requires proper forest management. In some parts of the forest, this means significant silvicultural activity; in others, critical habitats will need to be set aside for natural resource conservation. The components of improved forest management are:

- management planning;
- appropriate harvesting for the regeneration of desired species;
- assisted regeneration of desired species;
- thinning and/or other silvicultural activities; and
- RIL.

Activities such as silvicultural thinning may be required in the entire forest estate in advance of future harvests, not only in areas where harvesting has just taken place. For example, it may be beneficial to carry out release thinning of target trees some years before entering a compartment for harvest. Some silvicultural activities may be prohibited in some tropical forests and changes to regulations may therefore be required; also, in many cases, forest access roads must be destroyed after a harvest has taken place to reduce incursions. Under a proper, equitable governance system, however, local stakeholders deriving value from the forest would act to prevent such incursions.

Silvicultural thinnings are likely to generate large volumes of small-diameter timber of a wide range of species, and it should be feasible to develop processing capacity and markets for this type of material. Waste timber can be used for biomass-based energy.

### **Improved governance**

There have been significant moves in recent years towards the decentralization of forest administrations and revenue allocations, although such moves have been fully implemented in only a few cases. The historical fall in value of the salaries of forest officers has been a key driver in enabling forest corruption. In Uganda, for example, the salaries of forest officers had fallen to a mere 0.4 percent of their 1962 value (in real



terms) by 1988 (Webster and Osmaston, 2003). The components of an improved forest governance system would include:

- adequate salaries for forest administration officers;
- transparency in the allocation of forest tenure;
- the recognition of customary tenure;
- the allocation of appropriate revenues to customary rightsholders;
- the simplification of regulatory requirements;
- the elimination of inefficient charges;
- the revision of forest laws/regulations to make forest management feasible; and
- the elimination of inappropriate rent-seeking behaviour by government agencies and government officials.

In most cases, 1–2 percent of the timber value reaches local rightsholders; in some cases, none of this value reaches them (Arumadri, 2001). It is likely that the single largest incentive for supporting responsible forest management and forest conservation is to ensure that local rightsholders receive a fair share of the value derived from the forest.

A lack of transparency in the allocation of forest tenure is a key issue preventing the proper functioning of efficient markets for forest rights. In extreme cases, even the responsible authorities lack knowledge about forest tenure.<sup>9</sup>

### Improved forest business

Forest businesses in the tropics suffer from a wide range of problems that lead to inefficiencies in their performance as businesses and in their economic contributions to countries, including inadequate human resources, risk minimization, extreme demands on the rate of return on capital, and wasteful field and processing practices. Arguably, business investors are behaving rationally in requiring very high rates of return on capital in situations where governments are unstable.

An additional important aspect is the history of tropical forestry, which, for decades, has focused on harvesting old-growth trees. The expertise built up in tropical forest companies, therefore, has mainly been in the difficult task of optimizing harvesting. Only recently has forest management become a requirement, and little in-house capacity exists to implement this. In comparison with temperate forestry, which has been conducted for hundreds of years and has considerable funds for research and a major body of scientific literature, the literature on silviculture in tropical natural forests is tiny.

Markets for tropical timber are also highly inefficient compared with those for temperate timber. Tropical timber markets are opaque in terms of pricing information, and a lack of direct communication between end users and suppliers means there is enormous wastage at all points of the value chain due to the demand by traders for standard dimensions.

The structure of commodity markets for sawnwood and the dependency on standard dimensions and grades is a hangover from the past, when communication between

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<sup>9</sup> In Cambodia, for example, the Forest Authority had no official maps of rubber concessions issued for the Seima Protection Forest. The existence of the maps only became public after eight years, when they were obtained and published by Licadho (an NGO).

end users and sellers was impossible because of the long shipping times and poor telecommunications. This resulted in situations in which end users knew what they would get in terms of size and properties, even though the products did not necessarily meet their needs.

That situation is long gone, and end users can now communicate directly and in real time with sellers. Sawmills can provide dimensions that exactly meet the needs of end users, thereby reducing wastage at both ends of the supply chain and enabling very significant value recovery for both suppliers and end users. The market has not yet adapted to this new reality, however, and a new type of agent is required for the market to function efficiently.

Correcting the problems associated with concessions and tropical forest management in general, as outlined in this and previous chapters, requires a range of improvements in businesses, including the following:

- human capacity development in processing;
- human capacity development in forest management;
- incentives to ensure the full use of available yields (e.g. payments for allocated yields);
- incentives to ensure the full use of felled material (e.g. payment for volumes felled as opposed to volumes extracted);
- investments in efficient processing equipment to reduce volume losses and maintenance and running costs;
- human capacity development for timber-based manufacture;
- improved maintenance regimes for machinery to prevent failures;
- better market knowledge; and
- better communication with end users.

Most tropical countries have few skilled woodworkers outside the manufacture of craft items for tourism. Thus, the author observed that a rosewood furniture manufacturer in Zambia imported ten master cabinet-makers from China to manufacture products that would satisfy the high quality demands of its Chinese market. Over the years, these cabinet-makers will train their Zambian counterparts.

### Forest investment

The last decades have seen significant changes in patterns of concession ownership in many parts of the world. This change is best expressed as a move away from old ex-colonial capital, mainly from western Europe, to new eastern capital with sources in the rapidly growing economies of Asia. For example, Chinese companies had acquired concession rights to approximately 10 percent of the dense forest area of Gabon by 2010 (Putzel *et al.*, 2011). Malaysian-owned companies controlled the majority of forest concessions in Liberia in 2013, and Indian companies owned the largest forest concessions in Guyana. This trend towards Asian companies is associated with the increasing demand for tropical timbers in Asian markets. It is also possible that it is due partly to the much lower legality requirements of Asian markets compared with markets in Europe and the United States of America (Masiero, Pettenella and Cerutti, 2015).

Either way, the capital employed in tropical concessions is mainly family-based and obtained from other businesses because it is hard to obtain commercial capital for tropical forestry activities other than plantations (Clenaghan, Morenos and Thomas, 2009), particularly in countries with perceived high political risks. In addition, few companies meet the investment requirements of international investors, such as forest certification (Best and Jenkins, 1999).

### **WHAT IS WRONG WITH THE CONCESSION MODEL?**

Although concessions have been moderately successful in some cases, the failures appear to outnumber the successes based on an evaluation of revenue collection (Grut, Gray and Egli, 1991). It is rare for governments to collect in excess of 20 percent of the revenues due for harvested timber.

Modern concession systems are based on the government as “principal”, allocating certain rights and duties to concessionaires acting as its “agent” (Gray, 2002). The government lacks the capital and skills to manage the forest and provide other services such as education and health. The concession concept is based on finding agents with the capital and skills and then providing them with a contractual interest to do the management. The agents in this case are forestry companies with backgrounds in timber harvesting and timber processing. They usually have adequate skills in those two activities, but they have rarely needed to develop skills in tropical silviculture or in the provision of services because they have not had to perform these tasks in the past. Moreover, there is generally less scientific understanding of tropical silviculture than there is for temperate silviculture (Sitoe, Chidumayo and Alberto, 2010).

In an ideal concession system, concession-holders follow the laws of the country and the terms of the contract, but this has been rare in practice. In most cases, concession-holders seek to minimize their adherence to demands for forest management in order to minimize costs and maximize volumes by harvesting outside the scope of their permits. In Ghana, for example, the author conducted a follow-up of stumps in a concession operated by a company considered to be law-abiding and observed that four of the first five stumps examined were not included in the allocated yield.

Solutions to these and other problems must be based on a realistic view of forest management capacities. They also require the provision of adequate support and incentive systems that reward good behaviour sufficiently to render illegality and non-compliance with contracts unattractive.

In developing solutions, policymakers should fully take into account corruption and illegality, because failure to do so would likely result in policies and practices that do not achieve the desired effect (Amacher, Ollikainen and Koskela, 2012).

### **RIGHTS-BASED APPROACHES**

In many developing countries, forest-tenure systems are a hangover from previous colonial administrations. Under such systems, the rights to forest products, especially timber, may have become separated from other types of land and resource rights. These systems supplanted previous customary rights held under various systems of

social organization in which rights were allocated to individuals in systematic but undocumented ways.

Colonial administrations set up forest-tenure rights within legal frameworks that are largely still in place today. In practice, away from cities and large towns, traditional systems have continued to function with relatively little interference from central authorities. People have continued to use timber and NTFPs in much the same way as they did before colonialism.

Many countries run parallel administrative systems in which the centralized legal system runs alongside customary systems more or less comfortably. In these traditional systems and partly as a result of the lack of transport, timber was mostly used and traded locally for building and the manufacture of various items. Only recently has this timber acquired significant value due to demand from urbanized populations and the ability to transport them to export harbours.

Thus it might be argued that, because remote communities never made large-scale use of that timber, they have not established the customary right to use it commercially. Although such an argument may be valid in certain cases, what cannot be contested is that communities have made use of the land on which timber stands, with varying degrees of intensity. Forests have been used for the collection of timber and NTFPs, hunting, and as places to hide in times of war.<sup>10</sup> There is no place in any developing country accessible on foot that has not been visited and affected by human activities, and it is impossible to find areas where no land tenure previously existed.

Although sovereign states have centralized formal land tenure over much of their territories, both customary and de facto tenure resides with the land occupants.<sup>11</sup> These occupants may be long-term residents or more recent arrivals tolerated within the customary framework. Government attempts to allocate concessions over such land often lead to conflict. This has been increasingly recognized since the 1980s, with attempts to address the situation by, for example:

- requiring that local communities are able to continue traditional forest activities;
- requiring that a portion of concession fees is allocated to communities;
- requiring that concession-holders negotiate social responsibility agreements with communities;
- requiring “benefit sharing” over affected lands;
- requiring FPIC before the allocation of concessions;
- allocating concessions to communities; and
- transferring land title or forest tenure to communities.

On the other hand, it is clear that, where communities have de facto tenure over forest land but this land does not provide them with benefits, the forest becomes degraded and appropriated for other land uses that give greater returns (Karsenty, 2015).

<sup>10</sup> During the recent civil war in Sudan, for example, families from villages around Nzara in West Equatorial Province fled into the forest and lived there for decades before returning to their original villages when hostilities ceased in 2007.

<sup>11</sup> It is recognized, however, that, given political instability and large-scale population movements, in some cases such tenure may have been in place for relatively short periods.

It is likely that the future of forests depends on the value that local communities derive from them, regardless of forest tenure arrangements. Local communities have “boots on the ground” and are best placed, therefore, to determine whether concession-holders are honouring their contracts and to inform the competent authorities or independent observers.

The inclusion of local customary tenure-holders as well as governments and concessionaires in tripartite agreements negotiated under FPIC seems to be a prerequisite for effective concessions.

Simply transferring all forest rights to local communities is unlikely to be successful in all circumstances. If governments lack the capacity to manage forests for business purposes, it is even less likely that communities in remote areas will have such capacity. This is particularly the case for communities wishing to access higher-value export markets with good-quality products, which requires large areas and significant investment and human capacity. Most communities will require enormous support in terms of capacity building, planning, inventory, capital and technical advice on processing. The difficulties should not be underestimated, and overcoming them is likely to require a high level of support over several decades.

An alternative approach is to partner communities with entrepreneurs (Elson, 2011; Nhantumbo *et al.*, 2013) in what is known as “investing in locally controlled forestry” (ILCF). In this model, communities obtain forest tenure rights and seek entrepreneurs with capital and know-how to help them with forest management and processing. ILCF may work best when communities become organized in the manner espoused by the Forest and Farm Facility (FAO, 2017).

## WORKER RIGHTS, TREATMENT OF WORKERS, AND HEALTH AND SAFETY

The treatment of forest workers in developing countries has often been poor in terms of both employment (Azanzi *et al.*, 2014) and health and safety. Not all employers fail in this respect, and, in many cases, the employment offered by formal businesses able to take up concessions is of a much higher quality than that offered in the informal sector (Gretzinger, 2015) (see photo).

Health and safety is commonly overlooked in forests and processing facilities. Unsafe work practices are common, and outdated equipment lacking modern safety features is frequently in use. Moreover, safety features are often purposely disabled to facilitate machine access to forests. Outside inspection is important for limiting hazards in forestry activities, but corruption often leads government inspectors to issue safety certificates in situations where this is unwarranted.

When government-led safety-monitoring systems are ineffective, third-party systems such as forest certification and Occupational Health and Safety Advisory Services can serve to identify issues. The use of such systems requires that forest businesses are open to making the changes needed to raise standards to an appropriate level.

Migrant labour is used widely in the forest sectors of many countries, especially in Southeast Asia. There is a high risk of abuse of migrant workers, such as the risk of forced labour and the denial of fundamental workers’ rights, as laid down in the International



Labour Organization's Declaration on Fundamental Principles and Rights at Work and its Follow-up (ILO, 1998).



*Workers' field accommodation in a concession in Guyana consists of a tarpaulin*

## THE ROLE OF CERTIFICATION

Many stakeholders misunderstand the role of forest certification. Governments and businesses expect it to cure the woes of ailing businesses and to immediately bring success. This is wishful thinking and far removed from reality. There are significant benefits in obtaining certification, but they mostly arise from achieving good forest management rather than in the issuance of actual certificates. Businesses will invariably be disappointed if they seek forest certification for certification's sake or to meet regulatory requirements.

### Forest management

Certification standards require forest managers to take a more systematic approach to the preparation and execution of forest management plans that addresses all important aspects. It is vital that forest management plans take all significant impacts into account; it is just as crucial that resources are not allocated to unimportant concerns. This will help reduce wastage and concentrate resources where they are most effective. If planning is done well, management will be efficient and there will be a significant reduction in costs.



The key benefit of forest certification is that it improves the way businesses are run and the relationship between forest managers and other stakeholders. These improvements also help reduce the risks posed by illegal activities and natural disasters.

### **Forest markets**

Forest managers often complain that achieving certification has not led to higher prices for their products. There are two aspects to solving this problem: product quality, and marketing. No amount of certification can turn a poor-quality product into an attractive one. In the long term, a well-managed production forest will produce timber with better properties, thereby enabling an increase in product quality and thus higher prices. In the short term, improved harvesting and transport will produce less-damaged timber and increase volume recovery due to reduced wastage, leading to increases in both volume and product quality. In addition, improvements in sawmill practice can lead to an immediate increase in product quality and a reduction in waste and costs.

Such improvements may mean nothing to established customers used to buying low-quality products at a low price, who will simply rub their hands with glee and refuse to offer a single cent more. Improvements in quality combined with certificates, however, will enable managers to seek alternative customers prepared to pay more for higher-quality products and certification. Original customers, now short of timber, are likely to increase their price offers.

Making the most of certification requires forest managers to engage in marketing their products in new markets, and this is an expensive activity likely to require support from governments, NGOs and forest-sector organizations.

### **Auditing and transparency**

A key – but usually overlooked – benefit of certification is the presence of external auditing and the requirement for greatly increased transparency. Businesses have long recognized the benefits of having their practices reviewed by independent experts without internal conflicts of interest; such scrutiny has enabled the success of the many International Organization for Standardization performance standards and their associated certification systems. Forest managers seeking to limit the costs of certification usually engage the certification provider with the lowest fees, but this is the wrong approach. Rather, forest managers should seek out certification providers with the most experienced and respected auditors capable of adding significant value to their businesses by identifying inefficiencies and flawed forest practices.

Transparency is a key factor in reducing undesirable outcomes in forest management. It enables an organization to communicate its practices to stakeholders and to engage with them openly for the benefit of the business. Transparency enables businesses to demonstrate to regulatory authorities and businesses that they are complying with regulatory requirements, and this can be a powerful tool in combating corruption.

Transparency can only go some of the way in convincing outsiders that an organization is meeting its commitments. External verification is often required, and this is where external auditors can supply an important service.

When companies use independent auditing and transparency to demonstrate compliance with their contracts with government, it should not be necessary for the government to verify this independently. Thus, independent auditing may enable authorities to reduce the regulatory burden on companies – potentially an important incentive for companies to do the right thing.

## **“CONCESSIONS 2.0”: RECOMMENDATIONS FOR AN IMPROVED CONCESSION SYSTEM**

In moving towards a revised model of tropical forest concessions, it is necessary to state that there is no “one size fits all” solution because every country has its own social, legal and forest situation. Nevertheless, the recommendations below are aimed at all stakeholders and are in the form of interventions that could be taken by governments, development assistance agencies, concession-holders, rightsholders and other stakeholders. Not all the recommendations are relevant for all situations.

### **Revised governance**

1. Governments need to invest much more time and effort in the proper planning of concessions. They should avoid rushing to allocate large areas in the hope of short-term returns.
2. Concession planning must involve FPIC processes with stakeholders before the allocation of concessions. The recognition of overlapping tenure rights is a prerequisite for effective concessions.
3. Systems for the allocation of concessions should be fully transparent, with full public disclosure of all information related to competitive bids. Mechanisms should be put in place to allow public input into allocation decisions.
4. Models of concession governance should presuppose the existence of corruption and take this into account as part of the policy analysis on system development.
5. Systems for the allocation of concessions should be simplified so that all communications between bidders and government are made through a single point of access. Allocations must avoid undue delays, which are costly for businesses.
6. Governments should focus much more strongly on the control of illegal and informal activities that have impacts on markets and depress timber prices. The formalization of the commercial elements of informal markets could be an important source of government revenue by increasing general taxation.
7. Local stakeholders, including local governments, require extensive support and capacity building to be able to fulfil their role in concession management.
8. Governments should aim to achieve mixed concession systems in which both private concessions and community concessions are available in a mixed economy.
9. Governments should allocate significantly more resources to managing the forest sector. This should include more investment in the regulatory system through reform and capacity building.
10. Third-party observers of all types should be welcomed as contributors to good governance because of their independence and access to information.

11. Governments should govern. It is inadequate to have complex systems of regulation that are never enforced; it would be far better to have fewer laws that are properly enforced.

### **Facilitating forest business**

1. Concession fees should be as simple as possible to collect, and they should be based on a realistic appraisal of the expected value of the concession to the business. They should also be set in such a way as to avoid the inefficient use of forest resources. Bidders should have access to the forest before they submit their bids to assist them in making realistic bids based on proper knowledge of the likely costs of access and the quality and quantity of the forest resource. Fees should take into account market prices for timber.
2. There should be complete transparency in the collection of forest fees.
3. Concession tenure systems should be more secure based on good performance. Rolling tenure by rotation length (25–40 years), refreshed at the end of every short-term planning cycle (5–10 years), would give concession-holders the security needed to invest in better forest management practices.
4. Upfront charges and performance bonds requiring cash security constitute a significant cost to businesses, and alternatives should be considered. For example, an equity bond in a parent company with dividends withheld could be an effective way for a government to obtain security without imposing a capital cost on the company.
5. Incentives should be available to encourage companies to fulfil the terms of their contracts and to subject themselves to alternative systems of third-party inspection, such as certification.
6. The regulatory burden is a major deterrent to the formalization of small and medium-sized businesses. There should be significant advantages and government support for informal operators prepared to formalize their businesses, and regulatory requirements should be simplified.
7. Small-scale and community forest owners could be supported in developing mutually beneficial partnerships with entrepreneurs in forest management and processing.
8. There are likely to be advantages in governments, as owners of allocated timber rights, becoming partners with, rather than opponents of, concession-holders.

### **Improved forest management**

1. Forest management plans should focus on the essentials, such as achieving the objectives set for the forest resource and mitigating the most significant social and environmental impacts. They should be based, therefore, on realistic objectives and an assessment of key impacts.
2. Forest management plans should be supported by detailed technical guidelines that ensure they will be executed properly (e.g. instructions on how to carry out assisted regeneration in harvesting gaps).

3. Landscape-level planning should precede forest management planning to identify suitable concessions. An integrated land-use planning system involving all parties able to influence land-use decisions is vital. The “One Map” initiative in Indonesia<sup>12</sup> is an example of such an approach.
4. Independent technical experts can be useful in providing impartial advice, free of the restrictions imposed by government policies and the internal politics of governmental organizations.
5. Forest yield plans should be based on realistic expectations of growth given the silvicultural regime. For example, the improved growth and increased number of desirable species achieved through enrichment planting and tending in canopy gaps should result in higher yields, with the benefit of increased harvesting rates in the future.
6. Monitoring is required for key indicators. This is costly, however, and should be limited to the minimum necessary.

### **Involving local stakeholders**

1. Social impact assessments must be completed before concessions are allocated.
2. Social issues and engagement must be included in forest policies.
3. All customary tenure should be identified and mapped before the allocation of concessions so that customary rightsholders can be engaged in FPIC.
4. Specific solutions are required to address the problems faced by the informal sector. These should include measures to decriminalize the sector by simplifying forest codes and the allocation of timber rights.

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<sup>12</sup> Indonesia’s “One map” initiative is aimed at eliminating overlapping tenures and at standardizing the mapping of forests. A single map carrying definitive information is to be used by all ministries to avoid future conflicts. Previously ministries used maps carrying divergent information.









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