

# Mobilizing and Managing Public Forestry Revenue

Marijn Verhoeven

William Magrath

Amanda Robbins

Emily Kallaur



**PROFOR**  
INNOVATION AND ACTION  
FOR FORESTS



**WORLD BANK GROUP**

This series is produced by Governance Global Practice of the World Bank. The papers in this series aim to provide a vehicle for publishing preliminary results on Governance topics to encourage discussion and debate. The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s) and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent. Citation and the use of material presented in this series should take into account this provisional character.

For information regarding the Governance Discussion Paper Series, please contact contact: Ayse Boybeyi, at [aboybeyi@worldbank.org](mailto:aboybeyi@worldbank.org)

Authors: Marijn Verhoeven [mverhoeven@worldbank.org](mailto:mverhoeven@worldbank.org);  
Stephen R. Davenport [sdavenport@worldbank.org](mailto:sdavenport@worldbank.org)

Keywords: forestry governance; revenue management; transparency; tax; revenue administration

© 2019 The International Bank for Reconstruction and Development / The World Bank  
1818 H Street, NW Washington, DC 20433  
All rights reserved

## Table of Contents

<b>EXECUTIVE SUMMARY</b>	<b>1</b>
<b>CHAPTER 1: CHALLENGES OF FORESTRY REVENUE MANAGEMENT</b>	<b>4</b>
Conceptual Framework: An Unusually Tricky Principal-Agent Problem	8
Methodology and Approach	10
<b>CHAPTER 2: FORESTRY PLANNING: BUILDING A STRONG FOUNDATION</b>	<b>13</b>
Strategic Forest Management Issues and Planning	19
Tactical Forest Management Issues and Planning	22
Operational (Annual) Issues and Planning	23
<b>CHAPTER 3: OPERATIONALIZING REVENUE ADMINISTRATION</b>	<b>24</b>
Forest User Database	27
Revenue Projections	28
Billing System	30
Payment System	31
Payer Reporting	32
Data Management	32
Control and Compliance	34
Revenue Sharing and Determination	36
Audit	36
Dispute Resolution	37
Evaluating Country Revenue Management Systems	38
<b>CHAPTER 4: INSTITUTIONAL ARRANGEMENTS</b>	<b>39</b>
(i) Clearly assigned roles and responsibilities	41
(ii) Allocation of revenue functions separate from physical functions	41
(iii) Coordination between forestry agencies and the central finance ministry	43
(iv) Adequate resourcing and capacity	45
(v) Deterrence of corruption, and institutional ethos around sustainability	46
(vi) Transparency and stakeholder engagement	48
<b>CHAPTER 5: CONCLUSION</b>	<b>51</b>
<b>ANNEX 1: FORESTRY REVENUE MECHANISMS</b>	<b>55</b>
<b>ANNEX 2: FORESTRY REVENUE MANAGEMENT QUESTIONNAIRE</b>	<b>58</b>
<b>ANNEX 3: SOURCES ON CONTROL OF INDUSTRIAL FOREST CONCESSIONS</b>	<b>67</b>

## Acknowledgments

This paper is one of a series of knowledge products under a World Bank Group program on developing practical approaches to strengthening forest governance. It is a joint program of the World Bank's Sustainable Development and Equitable Growth, Finance and Institutions Vice Presidencies and financed by the Program on Forests (PROFOR).

The team appreciates the guidance and inputs from Stephen Davenport, Senior Governance Specialist and Task Team Leader (TTL) (EPSPA); Asmeen Khan, Practice Manager (EPSDR); Snezana Mitrovic, Practice Manager (EEAR2); Benoit Blarel, Practice Manager (SENGL); Garo Batmanian, Lead Environment Specialist and co-TTL (SENGL); Werner Kornexl, Senior Natural Resources Management Specialist and co-TTL (SEAE2); Nalin Kishor (Consultant, SENGL); Andrew Mitchell (Senior Natural Resources Management Specialist, SSAE1); Dirk Heine (Economist, EMFMD); and Alain Karsenty (Economist at CIRAD).

The team is grateful for other comments and inputs received, including from William Maloney, Chief Economist (GGEVP); Edward Olowo-Okere, Director (GGODA); Jim Brumby, Senior Adviser (EPSDR); Vinay Sharma, Global Director (EPRDR); Aichida Ul-Aflaha, co-TTL (Public Sector Specialist, EPSPA); Anders Jensen (Senior M&E Specialist, SENGL); Felix Junquera-Varela (Lead Public Sector Specialist, EMFTX); Kai Kaiser (Senior Economist, EEAG1); Klas Sander (Senior Environmental Economist, SCAEN); Giuseppe Topa (Independent Expert); Shomikho Raha (Senior Public Sector Specialist, EA1G2); Kathleen Whimp (Lead Public Sector Management Specialist, EEAG1); Najeeb Khan (Consultant, SENGL); and Lisa Li Xi Lau (Consultant, GENGE). Without the advice and expertise of these and many other generous colleagues, this report would not have been possible. Any remaining errors are the authors' own.

## Abbreviations

<b>AAC</b>	Annual Allowable Cut
<b>CFUGs</b>	Community Forest User Groups
<b>CIFOR</b>	Center for International Forestry Research
<b>DFID</b>	Department for International Development (UK)
<b>EI</b>	Extractive Industries
<b>EITI</b>	Extractive Industries Transparency Initiative
<b>FAO</b>	Food and Agriculture Organization
<b>FMP</b>	Forest Management Plan
<b>FMIS</b>	Forest or Financial Management Information System
<b>GDP</b>	Gross Domestic Product
<b>GIZ</b>	Gesellschaft für Internationale Zusammenarbeit (Germany)
<b>IT/ICT</b>	Information (and Communications) Technology
<b>MRV</b>	Measurement, Reporting, and Verification
<b>MTREF</b>	Medium-Term Revenue and Expenditure Framework
<b>NDC</b>	Nationally Determined Contribution
<b>NGOs</b>	Non-Governmental Organizations
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PER</b>	Public Expenditure Review
<b>REDD+</b>	Reducing Emissions from Deforestation and Forest Degradation
<b>VAT</b>	Value-Added Tax

## ABSTRACT

This paper considers the potential for improvements in forestry revenue management to complement other efforts toward sustainable forest management and to strengthen domestic resource mobilization. It describes forestry management as an extreme version of a classic principal-agent problem, which manifests itself in high levels of corruption, illegality, and revenue leakage at the country level. To address these challenges, the paper proposes that governments adopt a three-tiered sectoral planning process with an appropriately long time horizon, reflecting the length of forest life cycles and the uniqueness of the sector given forests' status as a renewable natural resource providing essential public goods. Building on a sound planning process, the paper recommends mainstreaming attention to revenue-related issues throughout sectoral management by improving data availability, increasing transparency and stakeholder engagement, and implementing a robust revenue management system. It suggests a set of key revenue management components and institutional principles that can be applied to the local context as appropriate, with the aid of a questionnaire developed to help governments assess current strengths and weaknesses. These approaches may enable governments to improve decision making on land use, protect financial and physical resources that rightfully belong to the citizenry, and strengthen the rule of law in a sector often plagued by its abuse.

## PREFACE

This report is part of a series of research outputs produced jointly by the World Bank's teams in the Sustainable Development and Equitable Growth, Finance and Institutions Vice Presidencies in support of the World Bank's 2016 *Forest Action Plan*. The *Forest Action Plan* emphasizes the need for a programmatic and coordinated approach to the sector, and includes a commitment to work with clients to build institutional capacity in the interest of sustainable forest management. Several priority areas for collaborative research were identified for the series, including revenue management (this paper), civil service reform, community-based forest management, and regulatory tools and private sector participation.

This work takes place against a backdrop of increasing calls to leverage fiscal and financial tools to tackle climate change. The Coalition of Finance Ministers for Climate Action, for which the World Bank will serve as secretariat, recognizes the leadership role that finance ministries will play in taking action on climate change.<sup>1</sup> Recently the IMF Executive Board asserted the important role of fiscal policies to address climate change,<sup>2</sup> while the growth of the Network for Greening the Financial System<sup>3</sup> underscores the emerging consensus around the role of the financial system in achieving the objectives of the Paris Agreement. In the context of the forestry sector, this points to the need for sound forestry revenue administration, the topic of this paper.

The paper's primary intended audience is government decision makers and administrators, as well as development practitioners. It aims to provide practical guidance on strengthening revenue administration to improve management of both financial and physical resources, to inform World Bank operations and to contribute to the broader knowledge base on forestry governance. The paper should be viewed as a starting point to provide policymakers with ideas and concepts that can help in designing a context-appropriate revenue administration system or reform program.

The paper does not attempt to cover national or forestry fiscal policy, as these are discussed extensively in other publications, including the recent *Fiscal Instruments for Sustainable Forests* (World Bank 2019a). Nevertheless, the paper underscores that a government's choice of fiscal instruments in forestry and other land use sectors plays a key role in forestry outcomes. Revenue management systems will need to adapt to fiscal policy innovations designed to strengthen sustainability and mobilize new revenue sources, such as carbon payments.

The paper is structured as follows: Chapter 1 sets out the challenge of revenue management in forestry. Chapter 2 considers the forestry planning cycle and revenue management implications. Chapter 3 offers practical guidance to building a sound revenue management system. Chapter 4 discusses approaches to strengthening institutions from a revenue management perspective. Chapter 5 draws conclusions and highlights opportunities for revenue management to support sustainable forestry, and for World Bank operations. The Annexes include common fiscal instruments in forestry (Annex 1); a diagnostic questionnaire for assessing the state of forest revenue management (Annex 2); and references on concessions management (Annex 3).

---

<sup>1</sup> <https://blogs.worldbank.org/climatechange/game-changer-climate-action-finance-ministers-step>

<sup>2</sup> <https://www.imf.org/en/News/Articles/2019/05/03/pr19136-imf-executive-board-reviews-fiscal-policies-for-paris-climate-strategies>

<sup>3</sup> <https://www.banque-france.fr/en/financial-stability/international-role/network-greening-financial-system>

## EXECUTIVE SUMMARY

**This paper seeks to help countries strengthen the governance and administration of existing fiscal policy arrangements in forestry to improve domestic resource mobilization and complement other efforts toward more sustainable forestry management.** Better revenue management has the potential to contribute to sustainability by boosting transparency, increasing data availability to inform key decisions on land use, and mobilizing resources to increase the fiscal envelope for improved forestry management.

**Failure to accurately project, collect, control and report forestry revenues deprives countries of public funds, while at the same time undermining governance and the rule of law in the forestry sector and beyond.** Common problems range from a lack of consolidated and transparent data on forestry activities, revenue and fees, to inadequate forestry revenue information to inform planning and land use decisions, to poor billing and payment systems, to limited resourcing for critical activities such as auditing (both physical and financial). All of these contribute to tax evasion, lower domestic revenues, and poor decision making.

**Billions of dollars in government forest-related revenue are lost due to criminality, corruption, tax evasion, administrative weaknesses, and other causes each year.** Investments in governance such as strengthening regulation and institutional capacity building have been undertaken, but forestry revenue management remains particularly weak in many countries. As countries look for ways to boost domestic resource mobilization while managing resources sustainably, an opportunity exists to strengthen this area of forestry governance.

**Problems in revenue management are closely intertwined with weaknesses in other areas of governance.** Forestry revenue management does not exist in a vacuum. At the highest level, failure to set clear priorities for land use and to ensure that sectoral policies are aligned with these objectives lead to conflict. Notably, fiscal policy and revenue mobilization in other resource sectors, especially agriculture, often create incentives for clearing forest land. If central finance functions are weak and vulnerable to corruption and graft, it affects all sectors. Within the forestry sector specifically, poor revenue collection reduces the resources and capacity of forestry authorities to supervise physical resources, creating opportunities for illegal logging, and potentially weakens the influence and stature of forestry authorities in the larger policy arena. Further, failing to transparently report revenue projections and collections from the exploitation of a public resource erodes public trust in government and forestry management. There are close linkages between keeping track of financial resources through sound billing and auditing processes, and keeping track of physical resources (which trees are being harvested and where), so that strengthening one benefits the other. Taking the steps needed to improve revenue management—from building appropriate financial systems and procedures to strengthening transparency and data management—has the potential to create a virtuous circle of sound management and environmental stewardship.

**To strengthen revenue management, governments should consider revenue policy and administration implications in every aspect of sectoral planning, rather than as an isolated function or an afterthought.** This means that estimating potential revenue is a key part of forest management. The management and supervision of physical assets should align with revenue systems for billing, payments, and audit, all of which depend on resource-intensive oversight and monitoring to ensure compliance with sound forestry and revenue management principles. Similarly, institutional

arrangements should support coordination between forestry authorities and central finance ministries, along with other land use agencies, to improve the quality of land use planning, analysis and oversight, while at the same time elevating the priority accorded to sound forestry management.

**The paper recommends that governments approach forestry planning and revenue management as a series of overlapping processes that align the nation's vision for land use with central revenue management systems.** At its core, this means improving forestry revenue data management to make better informed decisions on land use, while strengthening compliance, accountability and transparency in the sector. A three-phased forestry planning cycle including strategic planning (for the long term, or roughly the harvest cycle—generally around 25 to 30 years), tactical planning (for the medium term, or roughly five to ten years), and operational (annual) planning is outlined. Sound revenue management aligns with this planning process, reflecting the nation's vision for land use, medium term revenue and expenditure framework and annual budget process.

**Practical measures to strengthen forestry revenue management are proposed, drawing on lessons from forestry activities around the world and other extractive sectors in which revenue management has been more closely scrutinized.** Establishing a sound revenue management framework includes attention to the following components:

- **Establishing a forest user database**, which allows government officials to oversee the system, ensure forest revenue payers are operating according to agreed management plans, and coordinate revenue payments and administration across forest users;
- **Improving the accuracy of forestry revenue estimates**, corresponding to the strategic, tactical, and operational levels of planning mentioned above, which are critical to gauging the success of collections efforts, informing planning and budgeting, and identifying revenue leakage;
- **Building an effective billing system**, allowing officials to proactively request payments on schedule, rather than waiting for payers to comply with revenue obligations;
- **Establishing an efficient payment system** that is clear and relatively simple to facilitate transactions;
- **Setting clear payer reporting requirements and procedures** following standard reporting requirements to improve transparency;
- **Establishing reliable data management**, such as via a Forestry Management Information System and/or a Financial Management Information System that is suited to a particular country's needs;
- **Strengthening control and compliance** processes to identify cases of non-payment or underpayment by looking for variations from expected payments and coordinating with physical control and compliance processes;
- **Improving revenue sharing and determination** mechanisms to ensure appropriate incentives for revenue collection, enforcement and equitable distribution of revenues;
- **Implementing a thorough audit** process to improve compliance and reduce revenue leakage; and
- **Ensuring a sound dispute resolution** function is in place to address issues between government and other stakeholders in a legitimate, fair and standardized manner.



**Institutional arrangements supporting both sound revenue management and sustainable forestry outcomes are also considered.** The opportunities for institutional and forestry revenue administration reform will differ greatly by country depending on the size and nature of the forestry sector, strength of governance and rule of law, institutional setup, fiscal mechanisms used to tax the forestry sector and competing land uses (e.g. agriculture), and other aspects of the local political economy. Nevertheless, there are several common themes related to building strong institutions to support revenue management that could support broader improvements in forestry outcomes. Sound revenue management depends less on the specific institutional structures and rather more on the presence of the following characteristics:

- (i) Clearly assigned roles and responsibilities between the forestry and central finance/revenue authority;
- (ii) Separation of revenue and forestry management functions, with revenue policy and administration handled independent of those managing physical forestry assets;
- (iii) Close coordination between forestry agencies and the central finance ministry—for example, an inter-departmental committee or taskforce could be a useful mechanism to support this;
- (iv) Sufficient resourcing of forestry authorities to be able to address capacity constraints including in revenue analysis, enforcement and audit;
- (v) Addressing corruption in forestry organizations and building an ethos of sustainability; and
- (vi) Stakeholder engagement to improve sectoral performance and accountability.

**The review of available literature on forestry and revenue management revealed knowledge gaps that point the way for further work.** The approach outlined here should be considered as a starting point for designing context-appropriate revenue administration reforms for the forestry sector, but not a definitive guide. Since limited information is available at the country level on how standard revenue management practices are being applied in the forestry sector, case studies of existing forestry revenue management systems and institutional arrangements would further inform this report. Further evaluation of the impact of revenue administration measures could also improve the design of reforms, as would relevant international comparator data.

**The review presents several implications for World Bank operations and others working on forestry revenue administration.** There is significant scope for more coordinated work across the World Bank's forestry and tax teams, including via technical reviews of revenue management systems and institutional structures leveraging the World Bank DIAMOND tax administration diagnostic tool; assistance for strengthening revenue administration processes and systems; and capacity building for revenue projecting, auditing and dispute resolution. Through this work, it is hoped that revenue administration can increasingly contribute to sustainable forestry management and (to a modest extent) domestic resource mobilization, both of which are urgent priorities across the developing and developed world.

## CHAPTER 1: CHALLENGES OF FORESTRY REVENUE MANAGEMENT

- 1. Sound revenue management is no panacea for the persistent challenges facing the forestry sector. However, it is a valuable and under-utilized avenue for strengthening accountability and sustainability, at the same time as potentially going a small way to repairing government revenue leakages.** Forests contain economically valuable products that provide both direct and indirect support to as much as one-fifth of the world's population in terms of livelihoods, income, food security, fuel and other benefits. Healthy forests are also central to Earth's life support systems, performing vital functions such as carbon capture, watershed management and protection of biodiversity. This places forestry in a unique position, with standing forests being essential to human survival and exploitation of forests representing economic potential. To manage this tension, governments require planning processes and systems that go well beyond current practices, which are constrained by vested interests, economic pressures, lack of holistic and coordinated approaches to resource management, inadequate data, poor analysis and limited transparency. This paper sets out practical steps to improve forestry revenue planning and administration with a view to supporting sustainable forest management.
- 2. Sustainable forest management<sup>4</sup> practices aim to prevent deforestation and forest degradation, often by tackling endemic problems such as illegal logging, destructive logging practices, and corruption. Significant attention has also been paid to fiscal policy and its implications for sustainable land use (see Box 1.1). A related but lesser-known challenge is the weak revenue management that plagues the forestry sector in many developing countries.** The failure of governments to capture an appropriate share of the value commercially extracted from publicly-owned forests for the benefit of the public represents losses that go far beyond foregone revenue. Poor revenue collection is a *symptom* of larger problems in the forestry sector to the extent that it is driven by issues such as a lack of oversight, enforcement and transparency, which are conducive to fraud, corruption, and collusion, as well as unsustainable practices like overharvesting or clearcutting that significantly decrease future revenue potential. Poor revenue collection can also be a *cause* of the problems in forestry management by creating a situation in which the sector's low revenues mean that it lacks the clout and visibility within the government to secure adequate sectoral funding and oversight. Strengthening revenue administration therefore has a role to play in addressing the deep-seated problems that characterize the sector.
- 3. In most countries, revenue collection falls far short of what is owed.** While estimates vary and are uncertain, figures have suggested that countries in tropical areas may manage to collect just 20 percent (or less) of the forestry-related revenue they are owed (van Hensbergen 2016). Another estimate holds that governments lose around \$5 billion each year to tax and royalty evasion on legal logging activity (Castrén and Pillai 2017). Further, illegal logging may account for as much as 50 to 90 percent of forestry operations in the primary producer countries of the tropics, and 15 to 30 percent globally, while the forestry sector loses around \$29 billion per year globally due to corruption (INTERPOL 2016). It is also important to keep in mind that annual figures of government revenue or losses do not capture the long-term impact of logging on revenue mobilization, given the impact on the stock of forest going forward (which depends on logging practices and intensity), the long period required for regeneration, and the potentially irreversible impacts on biodiversity.

---

<sup>4</sup> According to the UN Food and Agriculture Organization website, "Managing forests sustainably means increasing their benefits, including timber and food, to meet society's needs in a way that conserves and maintains forest ecosystems for the benefit of present and future generations." See <http://www.fao.org/forestry/sfm/en/> (accessed Sept. 17, 2019).

4. **Weak revenue administration has spillover effects on broader governance.** Corrupt activity in the sector takes many forms, including petty and grand corruption, fraud, extortion, and collusion, and leads to significant losses of public forestry revenue (Kishor and Damania 2007). For example, loggers bribe forest monitors to overlook violations and fraudulent reporting. Forest officials demand payments and kickbacks to which they are not entitled from loggers or landowners. At a higher level, concessions are awarded and laws and institutions are shaped based on bribery or collusion. Weak forestry governance enables corruption and illegal activity—which require the involvement of a range of officials, given the difficulty of clandestine activity involving items as large as logs—with major spillover effects, undermining governance and commercial activity in the country overall.<sup>5</sup> Corruption may also have important adverse dynamic impacts on forest institutions by eroding capacity and weakening their ability to attract and retain qualified and committed staff and officials (see Ross 2001 for an examination of the links between institutions and management of natural resources in southeast Asia).

### **BOX 1.1: Forest Externalities and Fiscal Policy**

**Forests provide indispensable public goods, from carbon capture to biodiversity protection, watershed management, and more, and their destruction can have irreversible impacts.**

After coal and oil, deforestation and forest degradation were the third-largest source of global greenhouse gas emissions from 2005-2010 (World Bank 2016). According to the Living Planet Index, the total number of vertebrates around the world has declined by 60 percent over the last 50 years. Much of the decimation of the global wildlife population can be traced to deforestation and forest degradation (WWF 2018). The externalities generated by forests are so far-reaching that they justify the state imposing heavier taxation on activities that reduce or damage standing forests than on general business activities in other sectors that do not have such reverberating impacts. Fiscal mechanisms such as tax and royalty instruments are therefore important instruments of forest management, while also generating revenue for a valuable public resource.

**Fiscal policy plays an important role in motivating corporations to employ practices that are either more or less sustainable.**

Typically, a country's forest fiscal policy framework includes a set of instruments, including royalties, multiple types of taxes, and various fees and charges. The instruments selected, and the ways they interact, create dynamic incentives for commercial operations. For example, levying taxes upstream in the value chain (i.e. taxing felled logs rather than processed products like plywood) is thought to create an incentive for companies to minimize waste in the processing phase, while taxing processed products has the opposite effect (Karsenty 2010). Yet unintended consequences must always be considered. In Cameroon, moving tax collection upstream led to tax controllers being “captured” by companies, and revenue declined; a switch was then made to impose taxes primarily at the export “choke point” instead (World Bank 2019a). How tax and royalty rates are determined is also key; undercharging can have the effect of devaluing the resource and can encourage overharvesting and wasteful practices, while setting rates too high can result in tax evasion or increased illegal logging. Annex 1 provides a table listing common forest fiscal instruments and very brief notes on their generally predicted effects on forest outcomes.

<sup>5</sup> For a thorough review of the literature on corruption and forestry, see Sundström (2016).

**In the last two decades, literature on forest revenue policy has focused on how governments can create timber tax and royalty regimes that generate fair and appropriate revenue to compensate the owner (i.e. the public) for forest exploitation while also meeting overriding environmental and social objectives, and balancing standard tax policy considerations such as equity, economic efficiency, and administrative efficiency.** One line of thinking holds that by selecting the right mix of royalty and tax instruments along the forestry value chain, and setting prices appropriately (through tools such as competitive auctions and indexing to market rates), governments can incentivize sustainable exploitation of forest products and collect a fair share of the resulting revenues (see for example FAO 2003; Gray 2002; Repetto and Gillis 1988). Others caution that there has been insufficient attention to political economy factors as key drivers of forest outcomes (e.g. Kishor, Castillo, and Nguyen 2015; Ongolo and Karsenty 2015).

**A new report on “Fiscal Instruments for Sustainable Forests” (World Bank 2019a) explores in depth the ways in which fiscal instruments can reward and encourage more sustainable practices, if well designed. It argues that fiscal policy should target production methods (logging practices), rather than simply timber output, to influence incentives.** Fiscal policy impacts choices about land use (whether to convert forest land to other uses), the size of the informal forestry sector, the intensity of logging, the harvesting methods followed, and other decisions central to the state of forests. For instance, imposing and collecting larger amounts of tax (which may be desirable for a variety of reasons) may at the same time prompt companies to intensify production to maintain profitability, to the detriment of the forest. Moreover, policies in other sectors—such as agricultural subsidies, which can promote conversion of forest to cropland—have a pronounced impact. Environmental fiscal policy aims to correct market failures by affecting price signals to producers. Policy options include inter alia subsidy reform for deforestation drivers, the use of environmental fiscal policy such as feebate schemes that incentivize sustainable practices (e.g. lower taxes on sustainably logged timber or on land that sequesters higher amounts of carbon), and Ecological Fiscal Transfers that provide public incentives for conservation.

**Fiscal policy choices impact the institutional arrangements and processes for revenue administration, and therefore policy and implementation cannot be entirely separated.** A choice to decentralize revenue collection, for instance, will require strong institutional capacity at the local level and robust data sharing systems and procedures so that central finance authorities are aware of tax receipts. Revenue management functions would also be affected by differences in policies aimed at the informal sector, and whether mechanisms such as earmarking, Forest Funds (dedicated resources for forest management), feebates, or Ecological Fiscal Transfers to subnational governments are employed. For these reasons, there are no one-size-fits-all approaches to revenue management, but systems and processes must be developed based on the local policy and institutional framework.

5. **Addressing revenue management challenges will go some way to mobilizing domestic revenue and addressing persistent governance challenges in forestry. Governments may be motivated to address the issue of weak forestry revenue administration for several reasons:**

- To broaden and deepen the tax base (though it is important to recognize that potential revenue from sustainable forestry tends to be modest, especially compared to revenue from extractives such as oil or gas);
- To ensure fairness and equity, building public confidence and trust in governance, since deficiencies in revenue collection represent the siphoning off of a public resource (that generates large externalized benefits) for private gain<sup>6</sup>;
- To generate additional resources to fund forest management, either directly (if forestry revenues are earmarked for forestry-related expenditures) or indirectly (by raising the sector's visibility within the central government), and hence also to increase the attractiveness of keeping land under forest cover instead of conversion to other uses; and
- To strengthen governance more generally, as revenue administration reforms in one area—such as improving data collection and payment systems—can have positive knock-on effects for other governance challenges through paths such as increasing transparency.

6. **The desire amongst developing country policy makers to identify new sources of domestic revenue suggests an opportunity to better capture forestry revenue while strengthening forestry governance.** Box 1.2 provides an example from Nepal of the linkages between better fiscal management and better stewardship of the forest.

7. **At the same time, it is important to acknowledge that the choice of fiscal instrument can have a variety of implications for revenue.** Revenue management can complement efforts to reduce illegal activity and over-logging by improving valuation, planning, enforcement and resourcing of forestry. However, positive outcomes from improvements in revenue administration are not guaranteed. Implementing inappropriate, poorly designed, or poorly targeted fiscal instruments can have the opposite of the intended effect on sustainability—in other words, efficient implementation of fiscal policy is not a boon to sustainability if the policy itself is bad (see Leruth et al. 2001). The inappropriate choice of a fiscal instrument can also hamper revenue administration if it is overly burdensome to implement, and can have serious negative consequences for equity and economic efficiency.

---

<sup>6</sup> Krelove and Melhado (2010) make the following striking comparison: in Africa during the 1990s, roughly 95 percent of forestry value added went to holders of felling and concession licenses (Whiteman and Lebedys 2006), while governments have managed to capture 80 to 90 percent or more of expected economic rent in some recent oil concessions (Cramton 2007).

## **BOX 1.2: Fiscal Policy and Community Forestry in Nepal**

Roughly 30 percent of Nepal's public forests are managed by the country's nearly 18,000 Community Forest User Groups (CFUGs). A web of fiscal policies affects these forests, with forestry decision makers not fully aware of the fiscal instruments in place. The main thrust of the community forestry program has been toward forest protection rather than revenue generation, and as a result, crafting a coherent fiscal framework has not been a priority. A series of interviews and focus groups found:

- Confusion around tax jurisdictions, with central and local governments charging various taxes and fees and traders sometimes having to pay more than they legally owe;
- Local governments charging different amounts for the same quantity and quality of product, creating a non-level playing field and enabling traders to exploit the discrepancies to their own advantage;
- CFUGs selling forest products for low prices, suggesting under-compensation of communities;
- A lack of resources to complete the forest certification process, or to get credit for having done it, resulting in foregone revenue;
- Bans on export of some non-timber forest products in unprocessed form, resulting in increased illegal trade and smuggling of these species;
- Higher-income households benefiting more from revenue-sharing arrangements than the poor; and
- Lack of attention to the revenue potential of forest products evidenced by the fact that communities are investing little in capacity building for income-generating activities.

Clarifying the fiscal framework and better defining the roles of different layers of authority could result in increased financial benefits to the community and better stewardship of the forest resource.

*Source:* Paudel and Weiss (2013).

## **Conceptual Framework: An Unusually Tricky Principal-Agent Problem**

- 8. Forestry revenue administration represents an extreme version of what is known to economists as a principal-agent problem.** This conceptual framework was developed to help understand and explain organizational and institutional arrangements within and among firms in an economy. Applied to forestry, it helps illuminate why progress in revenue management and sustainable forestry has often been so elusive, and what sorts of safeguards or processes can be implemented to better align the incentives of all stakeholders with each other and with the country's forest policy objectives. In brief, public ownership of some forests can be desirable because of the public goods they provide, but governments are generally unable or unwilling to manage the process of economic exploitation of forest resources. Instead, a government (the "principal") mobilizes revenue from public forests by involving another entity (e.g. private company, community organization, or state-owned enterprise, a.k.a. the "agent") through various contractual arrangements.<sup>7</sup>

<sup>7</sup> A useful reference is FAO (2001). Note also that in addition to resource extraction, contractual arrangements can cover forest management responsibilities (such as replanting) or even the provision of public services such as healthcare, education, and infrastructure for the local community. The complexity of these arrangements can heighten the principal-agent challenge.

9. **The reasons that the principal-agent challenge is more pronounced in forestry than in many other sectors have to do with the unique characteristics of forests.** While principals and agents always have somewhat mismatched agendas, in forestry their objectives may be almost diametrically opposed to each other, i.e. if the government primarily cares about long-term sustainability and the agent only cares about short-term profits. Because of the unusually long time horizon implied in forest management (forest life cycles are measured in centuries), the effects of bad management can take many years to be fully appreciated, and many more decades to remedy. The geographical size and remoteness of forests also makes it unusually challenging for the principal to monitor the agent. Box 1.3 further discusses the ways in which the principal-agent dilemma presents itself in forestry management.

### **BOX 1.3: Applying Principal-Agent Theory to the Challenge of Forest Revenue Administration**

**There is a tension implicit in contractual arrangements for forest use, in that the government's economic, environmental, and social objectives will not entirely match the objectives of the forest user, which presumably wishes to maximize profit.** Since the government is unable to fully supervise the logging company or other entity, the extent to which the agent acts in a manner consistent with the principal's intentions depends on the incentives, motivation, and capacity of the agent. Essentially, if a concession or community-based system were to "work" (i.e. solve the principal-agent problem), it would induce the agent(s) to adhere to sound sectoral management processes oriented toward preventing deforestation and forest degradation.

**Principal-agent theory suggests that the key challenge is that of asymmetric information—the agent is privy to critical information that the principal does not have.** First, logging companies—especially large corporations—often have much more detailed knowledge of international timber prices and market opportunities, as well as more specific information about the quality and mix of timber resources in a given land parcel. This, coupled with the fact that companies are often more experienced and sophisticated in terms of deal making, frequently gives companies the upper hand in contract negotiations with the government. Second, and relatedly, companies have an incentive not to reveal their true cost structure to the government, thus potentially downplaying their profitability and thereby securing more favorable contract terms (Gaudet, Lasserre, and Van Long 1995). These information asymmetries mean that firms are able to collect an "information rent" from the government—in other words, they are able to negotiate prices that allow them to extract more profit from exploitation of the resource than the government realizes (Gaudet and Lasserre 2015). A third type of asymmetric information concerns companies' forestry practices and harvest amounts. Since the government is unable to fully supervise the company in the forest, it may not be aware of violations of rules and procedures, and may not have accurate information about timber volumes on which to levy royalties and taxes (payers may be required to self-report volumes harvested, per Gray 2002).

**There can also be multiple-level principal-agent problems, with actors serving simultaneously as principals and agents, which complicates the chain of accountability even further (Neill and Morris 2012).** Government officials, while acting as the principal

when dealing with a concessionaire, are ultimately agents of the public interest. Similarly, a concessionaire may act as a principal in relationships with other commercial entities (the “contractor’s contractors”). With such a potentially long chain of principal-agent relationships, true accountability can be elusive, and there is a risk of “principal capture” (when the principal works on behalf of the agent, i.e. acts in the interest of the commercial partner rather than the citizenry).

**Incentives facing actors at different points of the principal-agent chain vary.** For instance, it is common in some areas for concessionaires to subcontract felling operations, with the subcontractors paid to deliver certain timber volumes each month, and receiving bonus payments for going over the minimum amount. The incentive for the subcontractor therefore is maximum speed of harvest, even if some effort at sustainability (such as minimizing damage to other trees in the stand) would benefit the concessionaire, who has a longer-term interest (Karsenty 2018).

**Addressing the principal-agent problem, therefore, involves findings ways to shrink the information gap.** Some specific methods to address the principal-agent problem include forest management certification or community engagement, which mean in effect that the government is no longer the sole monitoring entity. Broadening the tent—including government actors outside the forestry agency, for example, and involving communities, NGOs, and the media in planning and management processes—can help to boost accountability. Holding competitive auctions, publishing contractual terms, and investing in a reliable forest inventory done by a third party are other strategies to level the playing field and discourage insider deals. While none of these methods is perfect, the idea is to identify key decision or transaction points that can be positively influenced by changing the nature of information and incentives the actors confront. Overall, there is a clear need for a structured, thoughtful approach to forestry sector planning and revenue administration that includes good political leadership, sound bureaucratic management, transparency, and stakeholder engagement.

## Methodology and Approach

10. **The result of a desk review, this paper brings together existing insights from the economic, governance, extractive industries and forestry literature, along with World Bank operational experience.** A review of the literature related to forestry revenue suggested that there is a significant body of work on revenue policy, but a relative gap with respect to the mechanisms and practicalities of revenue administration. Given the limited amount of accessible information on day-to-day revenue administration practices at the country level, it represents only a first attempt to define common revenue administration challenges and present practical steps to address them.
11. **One of the goals of this report is to help bridge the divide between sector-specific and general governance reform perspectives, and give officials working in central and line ministries a common language for strengthening revenue administration.** One could think of the potential differences in perspective on revenue management from a forest ministry compared to a finance ministry. The former might consider forest revenue management to involve timber and forest valuation, challenges to commercial profitability, selection of tax and royalty instruments, auctioning of concessions, and so forth. From a finance ministry perspective, revenue management might be thought of as the set of procedures and institutional considerations for



revenue estimating, collecting, tracking, and disbursing. This paper is focused on the mechanics of public revenue administration, while reflecting what makes the forestry sector highly unique when attempting to apply generic principles of sound revenue management.

12. **The focus is on the formal forestry sector (i.e. mainly commercial and largely industrial timber). Concessions regimes for natural forests are primarily in mind, but the term “concession” is used broadly and can be thought to encompass almost any public-private forestry arrangement.** According to FAO and EFI (2018), a forest concession is defined as “a contractual arrangement for the temporary allocation of public forest resources by the legal owner of an area (typically the state) to another party (e.g. companies, communities, NGOs).” The agreement can include rights to use or harvest designated forest resources, and/or obligations to assume certain forest management responsibilities. While some countries are currently winding down concession regimes and others initiating them, concessions are the primary strategy for exploitation of publicly owned forests in both tropical and boreal forests (van Hensbergen 2016).<sup>8</sup>
13. **Despite the frequent use of the term “concession” in this paper for ease of exposition, the principles of sound revenue administration apply to other forms of timber sales and forest tenure such as community forest management (and generally to nontimber products and services as well).** Other types of regimes (besides concessions, strictly defined) include sales of standing timber (short-term or long-term), roadside timber sales, forest management licenses, volume-based forest tenure, government (state-owned) forest enterprises, and joint ventures or partnerships between the government and a private corporation (Gray 2002). There are revenue administration implications depending on the type of regime (e.g. the event that would trigger generation of an invoice requesting payment) but the basic principles of sound revenue management apply broadly. Community forest management takes various forms and dominates in some countries; depending on the way these regimes are set up, the principles of revenue administration set out in this report may or may not be applicable. Finally, the informal sector is not addressed directly here as it is treated in a separate paper in this series on “Regulatory Tools, Effective Markets, and Private Sector Participation in the Forestry and Wood Products Processing Sectors” (World Bank 2019b), as well as in World Bank (2019a).
14. **The FAO’s 2018 report on “Making forest concessions in the tropics work to achieve the 2030 Agenda: Voluntary Guidelines” is available for countries thinking about how to improve management of forest tenure arrangements, of which revenue administration is one key component (FAO 2018).** Box 1.4, excerpted from the report, highlights key lessons learned from the controversial record of forestry concessions, many of which have been deemed failures. Cross-cutting themes that apply to revenue administration include the need for clear forest policy objectives; transparent and inclusive mechanisms; carefully designed incentives; investment in improved silvicultural practices; and others. These themes animate this report as well, which attempts to build on the FAO report by going into greater detail about the concrete steps and practical considerations involved in strengthening revenue management.

---

<sup>8</sup> Roughly 31 percent of publicly-owned forests are designated for production, rather than conservation or other uses (FAO 2016b). In tropical regions (Latin America, Southeast Asia, and West and Central Africa), concessions account for about 14 percent of publicly-owned forest, ranging from 4 percent in Latin America to 22 percent in Africa and 27 percent in Southeast Asia (van Hensbergen 2016).

#### **BOX 1.4: What key lessons have been learned from tropical forest concessions?**

*The following is excerpted from FAO and EFI (2018):*

- Clear policy objectives combined with transparent and inclusive processes increase the capacity of forest concessions to deliver sustainable forest management.
- Clear and consistent policy and legal frameworks facilitate the effective design, implementation and administration of forest concessions, while lack of clarity and inconsistency can lead to the opposite.
- Independent certification contributes to enhanced monitoring and adoption of sustainable forest management in concessions.
- A clear national land use policy, developed in coordination with all relevant stakeholders, provides for concessions coherent with national developmental objectives and minimizes conflicts, disputes and overlapping permits.
- Properly designed revenue systems that incorporate incentive mechanisms can enhance the implementation and performance of concessions and their economic feasibility.
- Illegality and bribery are major threats to effective concession regimes. Illegal production represents unfair competition with sustainable forest products, while bribery prevents coherence with policy objectives, appropriate generation and distribution of benefits, long-term investments and delivery of sustainable forest management.
- Clear and secure rights are crucial preconditions for long-term investment in forest concessions.
- Forest concessions and local communities can support one another when the latter are considered as key stakeholders in the design and administration of concessions.
- Multiple use (e.g. timber, non-wood forest products [NWFPs], and ecosystem services) can provide additional revenue streams to concessionaires and benefits to local communities.
- Securing the environmental integrity of managed forests and long-term productive potential requires more investment in silvicultural practices.
- Both private businesses and communities can efficiently manage forest concessions.

*Source:* Excerpted from FAO and EFI (2018).

## CHAPTER 2: FORESTRY PLANNING: BUILDING A STRONG FOUNDATION

15. **The urgency of the climate challenge underscores the need for a whole-of-government, multisectoral approach to land and resource management. Within this larger context, the foundation of sound forestry revenue management is a clear planning process—articulating a strategy, breaking that strategy down to tactical outcomes and developing an operational plan to implement.** This chapter focuses on the planning process in forestry management and its intersection with revenue management. These processes should be complementary, with sound revenue management generating better information to inform planning processes, and the planning process providing essential information for revenue projections and administrative requirements. A cyclical sectoral planning process uniquely designed around the long time horizon of forestry is recommended.
16. **A strategy for sustainable forest management should emerge from the larger national policymaking process, aligned with a country’s international commitments.** Each country needs a long-term development vision that includes priorities and principles around land and resource use. The country’s international commitments provide an overarching framework for these discussions—particularly the Nationally Determined Contribution (NDC) to emissions reduction under the Paris Agreement, and commitments under REDD+<sup>9</sup>. Pressure on forested land comes from a variety of sources including other sectors (especially agriculture, but also infrastructure, energy and mining); urbanization and population pressures; and logging and related activities, both legal and illegal. National fiscal policies and demand from consumer countries, and the policies those countries adopt (for example, bans on illegal imports such as the US Lacey Act), also shape forest outcomes. A vigorous national debate around how to balance competing priorities and risks would consider a number of issues, including how the natural environment can support healthy and vibrant communities at the local, national, and global levels; enabling a decent standard of living for all; mobilizing domestic revenues; and other needs.
17. **In practice, many countries have not established such a vision, and as a result forests become in effect a residual—forests represent what is left over after various stakeholders have assigned or relegated parcels of land to competing uses that may be more lucrative or expedient in the short-term.** Preferably, a national policy discussion would lead to a vision statement or strategy on which forest policies and reforms would be based. Policymakers would then design programs and processes that support them, which may or may not include provisions for commercial exploitation of forests.
18. **The discussion here sets out a practical planning process to support the implementation of a nation’s broader vision for land management, from the perspective of effective forest revenue management systems.** For a useful general framework on managing natural resource wealth at a high level, consult the Natural Resource Charter (“Natural Resource Charter” 2018).
19. **In the forestry literature, planning often starts with a discussion of the supply chain, focusing on the physical movement and transformation of trees from when they are**

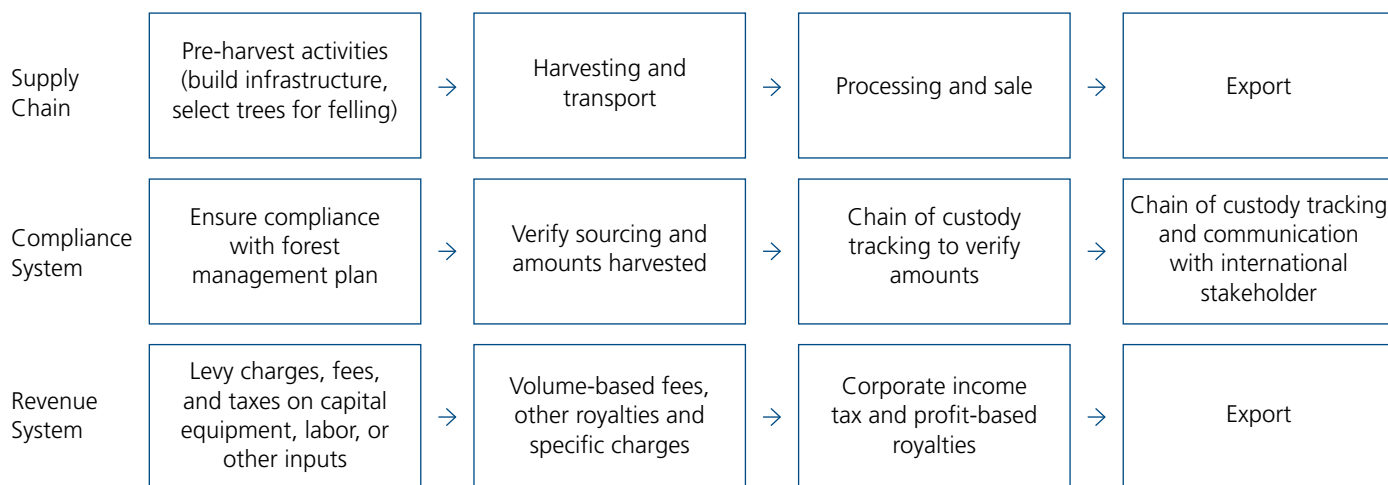
---

<sup>9</sup> REDD+ means “countries’ efforts to reduce emissions from deforestation and forest degradation, and foster conservation, sustainable management of forests, and enhancement of forest carbon stocks” (see <https://www.forestcarbonpartnership.org/what-redd>, accessed Sept. 17, 2019).

**felled in the forest until their arrival as logs or products at a port, mill, or factory.**<sup>10</sup> In these formulations, all supply chains are basically similar. Trees are selected for harvest (felling), usually according to some silvicultural rules formulated with the intention of ensuring that at some future time a subsequent stand will have matured capable of providing an essentially equivalent harvest in either volume or value terms.<sup>11</sup> Following harvest, the felled trees, depending on size, intended use, equipment, and so forth, will be delimbed, cut into logs of desired length (bucked), extracted from the forest (skidded), and loaded for transport to one or more subsequent destinations. Logs may be deposited at any number of primary, secondary or further “landings” as they are transported to mills where their transformation into higher value semi-finished and finished products will continue.

**20. In terms of revenue management, as the material moves along the supply chain, further and further from the initial forest site, value accrues and volume decreases due to processing, and taxes and charges are applied.** Depending on the specific commercial practices being followed, payments will be made in association with the movement and transformation of the trees and logs. Frequently, some substantial portion of the total charges to be applied will be due and payable prior to felling. Initial payments may be specifically linked to the identification and marking of individual trees or groups of trees. Further payments may be required as logs progress along the supply chain, from landing to landing or on arrival at a mill, port or other destination, and finally at the point of export. At some point, depending on contract terms, legal ownership (title) of the logs will change as payments are made and as transformations occur. Various contractors or agents of both buyer and seller may be involved, and more or less detailed and precise documents will be generated, distributed and retained to record transactions and physical results. Figure 2.1 shows the intersection of this simplified supply chain with compliance and revenue systems.

**Figure 2.1: Compliance and revenue implications along the supply chain**



**21. Supply chain planning models support physical and financial audits, streamline**

<sup>10</sup> For examples, see [www.earthworm.org](http://www.earthworm.org), McClure (2009), Kong and Rönnqvist (2014), and others.

<sup>11</sup> These rules revolve around the ecology of the involved species, site conditions, and other natural factors; market demand; and various other considerations. The rules may be formulated in terms of retention standards (number and kinds of trees per unit area to be left standing); tree selection standards (minimum or maximum sizes for trees to be harvested); and will be associated with post-harvest treatment plans and a planned cutting cycle up to the next harvest.

**documentation processes, and help with various management and control issues.** They have been used by timber enterprises to optimize the performance of wood supply systems by helping to reduce transit time and lowering inventories while ensuring adequate continuity of raw materials to processing facilities. Considerable interest has been given to supply chains in relation to ensuring the probity of timber sourcing and to documenting legality and “chain of custody.”<sup>12</sup> For instance, under the United Kingdom’s Timber Procurement Policy, timber suppliers can be required to present data supporting the legality and sustainability of the supply chain through which material to be supplied for public contracts has been obtained.<sup>13</sup>

22. **However, supply chain models are limited in three main respects. First, they abstract from the essential forest planning, control and sustainability concerns that underlie the logic of sound forestry policy.** Concessions are established, in part, to overcome limitations on the part of resource owners that prevent their conducting satisfactory timber operations in the first instance. The usual supply chain approach tends to involve various “end of pipe” assumptions regarding essential matters such as harvest-level determination, selection of silvicultural system, infrastructure development, and other strategic and tactical choices that, in concession settings, are highly variable and are internal to the concession management and policy system, as well as subject to the principal-agent problem of mismatched incentives. Deficiencies in these dimensions may not be apparent from the readily observable final stages of wood movement, but could be vitally important in determining the overall ecological, social and/or financial viability of a concession or concession system. In fact, it is worth noting that a forest concessionaire or other operator completely uninterested in sustainability (for whatever reason) could be seen to operate precisely according to the simple supply chain model. While a supply chain model may be useful in supporting maximization of revenue collected across a defined series of activities, it is likely inadequate as a framework for building a revenue system that aligns with sustainable forestry management more broadly.
23. **Second, most conventional supply chain models are not formulated in ways that conveniently capture many of the important revenue arrangements.** While harvesting and log extraction are often intimately associated with the accrual of royalties and other fees, there are often other charges that transpire independent of specific timber operations and may occur at recurring intervals (e.g. yearly). For example, many systems impose annual fees on the basis of contract area. Because the supply chain has no temporal dimension (it may represent a few months, or many years), these sorts of recurring checks and fees are obscured and peripheral. In addition, granting authorities may require bonds or other security. There may be financial obligations to third parties (reimbursements to communities or local governments) that are not directly tied to timber operations. Many taxes, including timber export taxes, which can be significant, but also income taxes and others, may be imposed by agencies not directly involved in overseeing timber operations, and thus may be overlooked because they do not fit neatly into these frameworks. Moreover, supply chains frequently get extremely complicated when processing commences, especially for low-value production such as pulpwood for paper or chipboard, mills buy logs from numerous suppliers, and wood supplies mingle. This can also be true of finished product manufacturers who source their materials from many different suppliers. Finally, concession authorities may impose

---

<sup>12</sup> See for example [www.earthworm.org](http://www.earthworm.org).

<sup>13</sup> “Department for Environment, Food and Rural Affairs UK government Timber Procurement Policy Practical Guide: Category B Evidence Supply chain information (3rd edition)” accessible at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/511054/Cat B Guide to Supply Chain Info 3rd Ed - Final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/511054/Cat_B_Guide_to_Supply_Chain_Info_3rd_Ed_-_Final.pdf)

other service fees, fines or penalties and other charges for activities disassociated from the linear supply chain. While potentially very important to both the grantor and the concessionaire, many of these transactions are significantly removed from timber transactions per se.

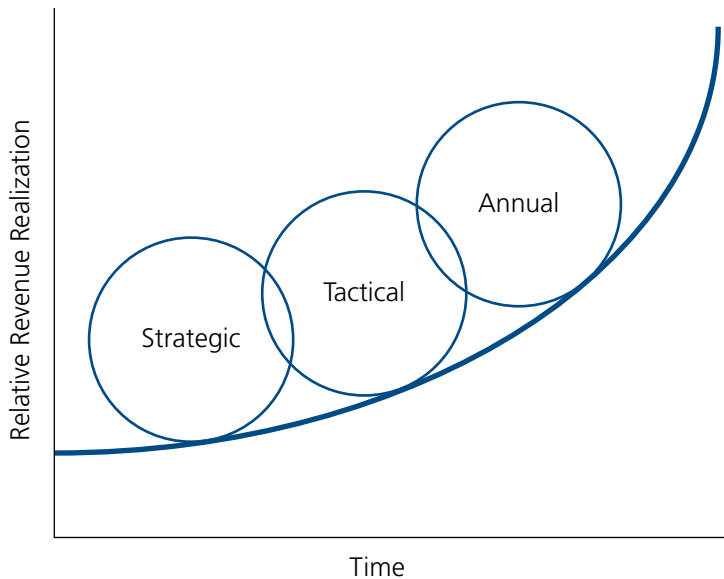
24. **And, third, they do not capture key elements of the most important and common regulatory and control arrangements.** Certainly, most forest concession regulatory agencies exert significant effort supervising logging operations and timber transport, and these are seen in many simple supply chain models. Forestry agencies may have multiple layers of staff, officials and contractors assigned to inspection and supervision of tree marking, felling practices, scaling, and so forth. Many countries rely on road and river checkpoints as central components of their concession regulation system. Indeed, significant environmental and economic harm can result from various sorts of deficiencies and violations along the narrowly defined timber supply chain. Unfortunately, however, the task of policing field level implementation of forestry practice is extraordinarily demanding and costly. In addition to the sheer magnitude of the task, and its staffing and cost implications, there is often legitimate scope for interpretation and judgment in the applicability of various standards and regulations. The standard value chain approach gives limited insight into these issues and complexities.
25. **Given the limitations of the supply chain as a planning framework for revenue administration, an approach suited to the unique nature of forestry management offers essential additional insights and guidance. Sustainable forestry and revenue management requires more than a system of checkpoints along which taxes are collected.** Systems must reflect and accommodate the very long life cycle of forestry, the technical knowledge required for harvest planning, logging and sustainable management, the geographically dispersed nature of forestry and the varied size and capabilities of forestry authorities, concessionaires, contractors and other actors. There are several important and unique considerations for forestry planning and revenue management. These include recognizing that exploitation of large forest areas for industrial logging differs from most commercial pursuits in: 1) the quite long time periods over which production is planned and carried out; 2) relatively high degrees of uncertainty about costs and quantities (partly because of the long time periods, but also on account of high information costs associated with diverse resources spread over large and remote areas); and 3) the periodic, but transitory concentration of production activities in time and space that are associated with logging and related works. In sustainable forestry, in contrast to the essentially linear supply chain view, management and commercial activities are inherently cyclical. Production decisions and processes in forestry are, almost by definition, repetitive. The precise pattern and sequence of repletion in forestry systems vary, but can be envisioned as a series of cycles giving rise to a single planning process.
26. **A planning process reflecting the cyclical nature of forestry and comprising *strategic, tactical, and operational* planning is used by many countries (though with differing nomenclature, and with varying degrees of effectiveness).**<sup>14</sup> Figure 2.2 presents these three elements to forestry planning. Note that this approach is also recommended in the FAO's

---

<sup>14</sup> Note that, although the discussion in this paper is framed in terms of a three-tiered planning framework, there is nothing inherently virtuous in three levels. The critical issue is attention to long term and broad spatial dimensions and consistency over time and space in intentions and realizations. This could be accomplished in four or more levels of planning, and conceivably in a single level. Three level planning approaches however are common and make for ease of exposition.

Sustainable Forest Management Toolbox, where additional practical guidance on its implementation is provided.<sup>15</sup> Although this report refers most often to concessions, the same planning considerations would apply to community-managed forests or other forms of timber sales and commercial exploitation.

**Figure 2.2: Three elements to better forestry planning**



27. **A cyclical, layered planning cycle facilitates continuous review of long-, medium-, and short-term objectives and how to achieve them.** *Strategic* forest management, also referred to as long-term planning, involves the consideration of broad land and forest allocation choices. At this level of planning, based on relatively limited data and knowledge, planners advise decision makers on options that, subject to further analysis and investigation, will shape resource development results over the long term. This should be contained in the national forest inventory, covering long term strategic planning requirements. *Tactical* planning, involving more detailed investigation and resource assessment, builds on strategic planning to strengthen the conclusions of earlier work and to begin to describe in detail a development program on a five- to ten-year horizon. This should be reflected in forest management plans (FMPs), which articulate how specific areas are managed in the medium term. *Operational* planning, generally on an annual basis, will determine specific plans for works, including harvesting, stand treatment, road construction and other activities, and will, based on much more detailed inventories and assessments, predict the expected results of the management program with even greater precision and accuracy. This should be reflected in the annual plans that detail how the FMPs are implemented.
28. **Further, a cyclical planning cycle aligns with sound revenue management practices (see Table 2.1).** At the *strategic* level, government officials would be able to calculate a general estimate of long-term revenue potential from a given parcel of land (note that this already is more location- and time-specific than the very high-level revenue projecting that would be undertaken as part of

<sup>15</sup> In particular, refer to the module on Forest Management Planning, available at: <http://www.fao.org/sustainable-forest-management/toolbox/modules/forest-management-planning/basic-knowledge/en/>

creating an overarching forestry strategy, discussed at the beginning of this chapter). At the *tactical* level, more precise revenue estimating would be possible, and these figures could be used in the government’s three- to five-year planning process (such as developing a Medium-Term Revenue and Expenditure Framework). At the *operational* level, revenue projections should be precise enough to be linked to a billing and payment schedule and to enable annual budgeting. Overall, the degree of accuracy and precision increases as the time horizon shrinks.

**Table 2.1: Recurring Phases in the Forestry Management Planning Process**

	<b>Strategic</b>	<b>Tactical</b>	<b>Operational</b>
<b>Description</b>	Identify land units potentially suitable for commercial exploitation; select silvicultural system; conduct national forest inventory; design fiscal policy framework and mechanisms	Allowable cut estimates; medium-term forest management plans; indicative scheduling of harvesting areas	Detailed annual planning on how to implement forest management plans; selection of individual trees for felling
<b>Relevance for revenue management</b>	Calculate potential revenue envelope; create long-term revenue projections and assess viability of commercial exploitation	Prepare Medium Term Revenue and Expenditure Framework (MTREF) projections (three to five-year time horizon)	Create annual revenue projections; plan cash flow; create payment schedule and anticipated amounts in billing system

29. **The various layers of the planning process (strategic, tactical and operational), and the specific ways that policy and legislations cause them to be implemented, will offer different opportunities and have differing implications for the accrual and recognition of revenues to both the forest enterprise and the landlord and taxation authorities.** Revenue matters are similarly cyclic and iterative. At each planning level, more detailed information becomes available on the values to be generated from the execution of the timber business—including more detail on the forest resource, on cost of operations, on timber marketing prospects, and other factors. The opportunities for capturing these values for the landowner, however, vary across the layers and also call for utilization of different assessment methods and administration systems. For example, volumetric and species-based fees are only practically exerted during and in the context of operational planning. Area fees, on the other hand, can be assessed and charged as early as the strategic level, although they can potentially be refined at the tactical or operational levels on the basis of better-defined operable area estimates or the definition of areas for logging or other treatments. Based on contractual arrangements and bargaining among the parties to the concession system, a range of options will be available, and an understanding of the planning process will facilitate their selection.
30. **Moreover, at each of the three levels (strategic, tactical, and operational), government authorities need to undertake a review of forestry arrangements (such as concessions and other operations). Properly executed, the forest management authority’s exercise of its review functions, and its administration of the revenue arrangements provided by legislation and contract, are the links that hold the system together.** The authority’s acceptance or approval of forestry actors’ performance, or its enforcement of its prerogatives in seeking remediation of deficiencies, are the triggers that permit advancing along the supply chain. For ease of exposition, the discussion here describes the planning and review processes in a system that imposes most planning requirements on concessionaires or other forestry actors (such as



community-based management arrangements). In cases where the forest authority retains these, obvious accommodations are needed.

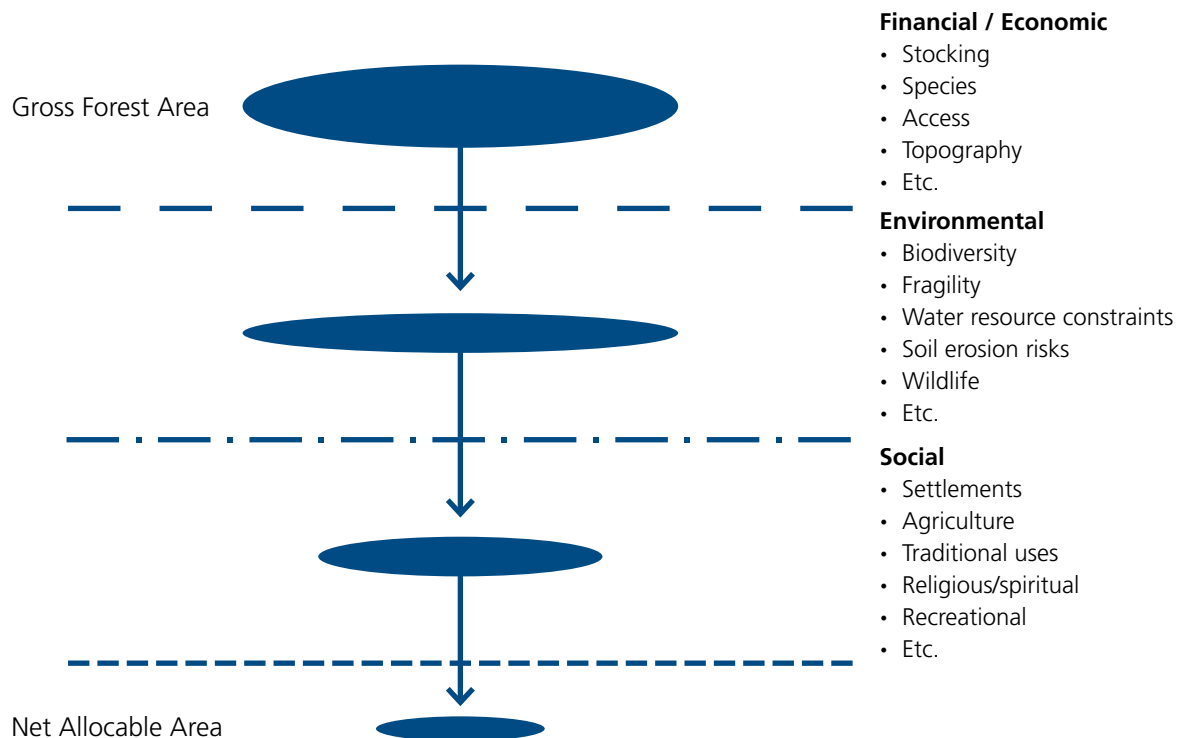
31. **At each level, on the basis of legislation and contractual provisions, the forest authority establishes procedures and standards against which performance is to be judged.** Typically, the forest authority will set a schedule for submission of plans; provide templates, and set standards for map scales, inventory layouts, and sample protocols; and establish expectations regarding consultations with local communities and other stakeholders. Where there are requirements for environmental assessment (which may be under a different jurisdiction) the forest authority could facilitate compliance. Plan review can be a demanding and sometimes contentious process that can be especially challenging for a forest authority with limited qualified staff and equipment and other constraints. In conducting its review, the forest authority would typically seek to investigate a number of issues, which are described in the relevant sections below.

### **Strategic Forest Management Issues and Planning**

32. **The most important issues addressed in most strategic-level forest management planning are aimed at ensuring that forest resources are allocated to uses and users for which they are fundamentally suited and through which they will best contribute to the goals of forest policy.** In most cases, forests will already have established patterns of use, which may or may not be legal or in other ways officially recognized or sanctioned. Nevertheless, forest legislations and policy in most countries provides a basis for periodic and in some instances continuous reconsideration of forest allocations. With respect to forests under industrial concession or license, the term of the license (which for industrial applications is usually related to the length of the cutting cycle, i.e. roughly equivalent to the rotation) is a natural basis of a strategic planning cycle. This would permit the forest authority the opportunity to take into consideration new data on the forest, developments in demand for forest products and services, and ongoing performance of concessionaires and licensees.
33. **A wide variety of technologies, methodologies and criteria are used to guide land and forest allocation at the strategic level.** Developments in remote sensing are enabling better forest information to be collected and are also moving toward enabling estimation of standing wood volume, but there is inevitably a relatively large confidence interval at the small-scale planning level of most strategic planning. As a practical matter, most industrial forest land allocation methods amount to application of a series of screens or filters applied to sort forest areas into units potentially suited to commercial exploitation. For example, as illustrated in Figure 2.3, starting with an estimate of the total forest area available for allocation, a planning approach could be developed that would remove from consideration areas of low productivity (wood volume growth); high costs of operation (e.g. areas with steep terrain and difficult road access); etc. Further areas would be removed from consideration by virtue of potential conflicts with biodiversity conservation objectives; watershed management consideration; wildlife habitat concerns; etc. Another layer of concern would consider social factors including established patterns of settlement and agricultural potential; non-timber forest product endowments and use patterns, and so forth.
34. **Based on a process of elimination, potential forest management units may be identifiable.** These would present a combination of size, proximity to market, economic potential and other

assets, that qualify them as potentially attractive sites for industrial allocation and development (by concession agreement, or other form of timber sale or land tenure arrangement). An effective site selection process will, among other things, ensure that only forests capable of supporting properly conducted operations and affording the operator with at least a normal rate of return while allowing scope for payment of a royalty sufficient to compensate the landowner are brought under concession operations.

**Figure 2.3: Hypothetical Impact of Screening on Allocation to Prospective Uses**



35. **Transparency, competitive procedures, and community engagement should be central to forest allocation—this merits a brief discussion here, but for additional guidance see FAO (2018).** Some countries allocate forest harvesting rights at reduced fees to encourage investment, at the risk of distorting the market, undervaluing the resource, and creating various other perverse incentives. Frequently the forest sector fails to receive appropriate revenue for the sale of its timber through the concession system because royalties, tax rates, and other fees are seldom reviewed and rarely reflect the true value of the resource. Once the resource is undervalued it creates the opportunities for windfall profits (for the concessionaires), which then creates opportunities for corruption and kickbacks if the concession allocation procedure is not completely transparent and fair. Even if fees are set appropriately, if awards are made as political favors rather than via an open process, the same problems will result. Karsenty and Vermeulen (2017) discuss a “Concessions 2.0” approach to address some of the problems with conflicting tenure rights and marginalization of local communities. This modified approach allows for overlapping land use rights (e.g. by indigenous communities and industrial concessionaires) that permit the harvesting of different types of resources at different times, along with provisions for inclusive governance and revenue sharing.

36. **With respect to areas already allocated to industrial exploitation, at later stages in the**

**strategic planning cycle, the track record on implementation would additionally be considered.** Based on experience, planners would look for indications of conflict with other uses, adequacy of economic and financial results, and other indicators of viability and sustainability.

**37. At the strategic planning level, significant attention and justification will be given to the selection of silvicultural system(s)<sup>16</sup> and prediction of an Annual Allowable Cut (AAC).**

Proposals at the strategic level would be subject to revision upon further investigation at subsequent planning levels, but would need to be sufficiently definitive and confident to support a prediction of an Annual Allowable Cut (AAC). Preparation and refinement of an AAC estimate is one of the most important elements of the planning sequence as the harvest level will be determinative of the ultimate viability of a management program and its environmental impact. AAC estimates involve predictions of future yields based on a variety of assumptions and can build on experience, research and other justifications, but are inevitably uncertain and subject to controversy and dispute. Without going into inevitably site-specific considerations, an AAC estimate will encapsulate information, *inter alia*, on:

- The areal extent of the forest, taking into consideration what is known about variations in forest type, openings in the forest, cleared areas, etc.;
- The level of stocking of commercially attractive species, and to the extent possible, knowledge about age and size distributions;
- Accessibility and operability constraints such as terrain, wetlands, occupancy, etc.; and
- Judgments on the response of the residual stand to logging in terms of future rates of growth of commercially desirable species and impacts on biodiversity and other measures of sustainability.

**38. At the strategic level, the review should, to the extent feasible:**

- Seek to explore the realism of the proposed management approach—is the concession area genuinely suited to, and capable of supporting environmentally and socially sustainable and commercially viable operations?;
- Explore the validity of the data and other claims contained in the plan;
- Independently consider stakeholder views and concerns, and assess the adequacy of measures proposed to mitigate potential adverse impacts; and
- Provide objective recommendations to policymakers on the advisability of pursuit of the concession plan, with (as appropriate) plan acceptance conditions, revision requirements.

**39. At the strategic level, an estimate of long-term revenue potential would be determined and could be made available on an intersectoral basis.**

A rough projection of expected annual revenue would inform analysis of the financial viability of the proposed operations, and would inform the government's long-term budgeting exercises. The magnitude of the long-term projection is likely to play a role in defining the status and role of the forestry authority in revenue management discussions and planning. It also provides a critical benchmark to assess the effectiveness of revenue collection and financial viability in the future—without first setting a goal, it is difficult to assess whether operations are proceeding as planned. Finally, an idea of the magnitude of expected revenue is important in designing a revenue management system with an appropriate level of administrative capacity and complexity.

---

<sup>16</sup> A useful definition of silviculture in this context is the selection of trees to be removed to make way for regeneration of the future forest.

40. **Developing projections of potential forestry revenue based on commercial exploitation provides critical information in evaluating whether industrial logging can or cannot be conducted in a way that generates a profit for the logger and a revenue stream for the government, while meeting sustainability criteria.** Lack of a realistic path to commercial profitability that is consistent with responsible forest management is a recipe for (potentially irreversible) environmental damage, as well as corruption, tax evasion, and other related ills. Sustainable practices (reduced-impact logging) can be costly in the short term and may not be prioritized by concessionaires and licensees. The lack of a rigorous process to determine a realistic estimate of commercial profitability (recognizing the perspective of the operator) may have contributed to acceptance of practices leading to forest degradation.

### **Tactical Forest Management Issues and Planning**

41. **Between the long-term strategic level issues of land and forest allocation and the actual execution of operations such as tree felling, road construction, post-harvest treatment and other works, are a large number of medium-term, or tactical, choices.** While strategic planning generally addresses the question of “what is to be done?”, tactical planning considers “how will it be done?”. This includes more detailed and precise refinement of allowable cut estimates, plus indicative scheduling of harvesting areas and formulation of infrastructure and access plans.
42. **Based on the outcome of the strategic planning exercise, tactical planning begins with identification of areas to be targeted for development and treatment over a medium-term period.** Planners will attempt to divide the area into units of roughly similar areas and volumes so as to be able to support a consistent stream of future harvest. Typically, more intense inventories will sharpen volume and yield estimates, and will prioritize generally contiguous areas to economize on infrastructure (road and landing) development both within the areas to be treated in the medium-term plan period and areas to be addressed in subsequent periods. Planners will also give consideration to regeneration, forest protection measures (fire, encroachment, pests, theft, etc.), and social or community obligations.
43. **The forest authority’s plan review process at the tactical level would revisit the issues considered at the strategic review level in the light of new and additional information.** It would also assess the feasibility of the proposed tactical plan, and identify risks and develop mitigation options.
44. **At the tactical level, AAC estimates will be refined and better and more detailed information will be available with which to forecast revenues.** This would allow the government to formulate medium-term budget projections that would feed into the medium-term revenue and expenditure framework, which proposes the resource envelope for the next three to five years. As part of its medium-range planning process, the government should determine indicative budget figures for investment and recurrent expenditure for forest sector management.

### **Operational (Annual) Issues and Planning**

45. **Priority aspects of annual plans arise from seasonal considerations, such as dry and rainy seasons, the need to accommodate government budget cycles, and the simple need to focus**

**planning around a limited, concrete set of activities.** Annual plans will document the full range of activities to be undertaken, including preparatory activities, harvesting and transportation, and also post-harvest treatments (possibly including treatment of areas harvested in previous years under earlier annual plans); advanced road and infrastructure development; pre-harvest inventories and tree marking work in coupes planned for future logging, with precise definitions and maps; social and community obligations and engagement; and forest protection measures anywhere in the management unit. Detailed engineering specifications will be available at this stage for major infrastructure. Work planning will address manpower requirements.

46. **Field-level preparation for logging, which due to time and seasonality constraints will often be conducted a year ahead of logging, includes works such as the completion of access roads and infrastructure, and preparation of landings and other facilities.** In selective logging systems, trees within the coupe will be individually identified, measured (height and girth), marked as targeted for logging, and, in well-managed operations, mapped and recorded in a tree list. Some log chain of custody systems are initiated at the pre-logging stage with tagging of trees below and above the future level of the felling cut. Trees within the coupe meant to be retained (“keep trees”) may be marked as well. In both selective-logging systems and clear-felling systems, the boundaries of the coupe will be marked as well, and any internal areas to be withheld from logging (for example, fragile areas or areas with social, religious, biodiversity, erosion or other significance) will also be delimited on maps and on the ground. These delineations, tree markings, taggings (if any), and records will be subject to inspection prior to the commencement of logging.
47. **At the operational level, the forest authority’s plan review would revisit the issues considered at the strategic and tactical review levels in the light of new and additional information.** It would also attempt to anticipate the monitoring and supervision needs of the proposed works that will be imposed on the forest authority. In conducting plan reviews, the forest authority would ensure the basic compliance of submissions as measured against any templates, samples, or pro-formas. The forest authority would validate calculations and compare maps and other data with available references. Where appropriate and feasible, the authority may conduct surveys and conduct plot measurements as a basis for testing the validity of claims made in submissions. Consultants and third-party service providers, although not a substitute for government oversight, may be able to help forest authorities overcome capacity constraints. Stakeholder consultation should also take place with indigenous groups in the forest, other relevant community groups and NGOs, as well as forest sustainability certification companies given their expertise and access to information on compliance and production methods, discussed further in Chapter 4.
48. **The objective of all plan reviews is to determine if the operation ought to be cleared to advance to the next stage of planning.** Only in the case of operational plan reviews are determinations made about physical works (i.e. triggering a movement along the value chain). Throughout the review of operational plans, the forest authority can reach a number of conclusions:
- Plans can be accepted subject to specified revisions or conditions: conditions may be determined by the forest authority (e.g. a reduction in the proposed harvest level), or could call for the concessionaire to conduct further planning and resubmit;
  - Plans can be rejected with or without the option of resubmission; or
  - Plans can be accepted.

49. **At the operational stage, timber revenue estimates should be quite precise.** Prior to logging, a well-regulated system should be able to provide managers, regulators and other stakeholders a detailed projection of the harvest, including number of trees to be felled, the wood volume to be produced and removed from the forest, and the species and size mix. This would allow preparation of financial information including total value and royalties due, in formats capable of supporting revenue collection planning and detailed monitoring and audit functions. There is a need for close linkages between planning and revenue management functions such that a change in plans with implications for harvesting or other revenue-generating activities is then factored into the revenue process (for example, by adjusting expected revenue for the year, and/or making adjustments in the billing system).
50. **The proposed cyclical approach to planning in forestry has a number of implications for revenue management and domestic resource mobilization.** The following chapter considers how the planning cycle also necessitates strong revenue management systems to achieve the outlined benefits of a more coordinated forestry planning process. Following this, a forestry sector questionnaire (Annex 2) has been developed to assist countries in reviewing forestry planning and revenue management systems. It may also be useful to consider applying the World Bank's DIAMOND tax administration diagnostic tool. This tool is available to support countries in assessing their current practices and identifying opportunities to strengthen planning and revenue management in forestry.

### CHAPTER 3: OPERATIONALIZING REVENUE ADMINISTRATION

51. **A well-developed forest planning process will only be as effective as the revenue management system put in place to achieve it.** This chapter considers the steps required to operationalize sound revenue management, in support of the sustainable forestry management planning process discussed in the previous chapter. This includes systems that facilitate such essential functions as tracking who is supposed to pay, defining a set number of channels through which payment can be expected, and ensuring compliance. Setting out rules and obligations through the legal and regulatory framework, and through individual contracts or agreements, mean nothing without implementation, monitoring, and mechanisms to correct problems or deviations that occur. Just as there is a tax administration to manage the collection and distribution of income and company tax revenue, forestry authorities require equivalently sound revenue management systems for forestry revenue collection. Drawing on lessons from forestry and other extractive industries, the guidance set out here is intended for forestry and central finance ministries to enhance their ability to analyze potential forestry revenue, strengthen collections, ensure proper handling of receipts, and mitigate unintended consequences of revenue generation.
52. **Contracts and the related regulations and administrative arrangements are the mechanisms through which governments navigate forestry's principal-agent challenges.** Contract provisions need to reflect the components of the revenue management system and its quid pro quo arrangements, clearly setting out obligations and procedures such as reporting requirements, payment processes and audit obligations. It is through the contract that all parties understand and are effectively bound to the framework in which they are operating. Annex 3 provides a sampling of practical references for those involved in establishing, administering, enforcing and resolving conflicts related to contracts concerning industrial forests.

53. **The personality of licensees and their capacity heavily influence the effectiveness of forestry revenue administration.** Typically, industrial concessionaires are corporations with various ownership structures, some form of commercial license to operate (independent of the forest contract), an internal corporate hierarchy of employees, contractors and subcontractors and suppliers, commitments to customers, and accountability to multiple governmental authorities and the public. Other types of entities (such as community structures under a community forest management regime) can function in analogous ways. Concessionaires pay a range of taxes (e.g. income tax and VAT), like other corporations, in addition to forestry-specific charges. General commercial regulations will establish what kinds of reporting, record keeping and inspection obligations the concessionaire will have to meet. Although large logging corporations may have more experience than their government counterparts in negotiating contracts and interacting with international commodity markets and stakeholders, many of these companies are quite unsophisticated and lack technical silvicultural know-how. The technical and commercial sophistication of concessionaires is an important variable in the outcome of a concessions regime and revenue management.
54. **The concessions approach tends to assign a high level of responsibility for execution of various forest management functions to the concessionaire, and this extends to many aspects of revenue management.** Assignment of forest management responsibilities is: 1) seldom complete across all management functions; 2) often not unique, in that in many concession systems a level of redundancy is built in so that both concessionaire, the granting authority and possibly others will conduct the same or similar activities<sup>17</sup>; and 3) not unlimited, in that the granting authority will retain discretion to intervene under various circumstances. The adaptability or flexibility that concession contracts and management programs afford can be misused, but it can also be used to adjust the division of responsibility in countless ways.<sup>18</sup> Thus, for example, in some concession systems the forest authorities may retain responsibility for certain planning and inventory work, while in other systems, those same functions will be carried out by the concessionaire.
55. **Similarly, responsibility for some functions related to revenue management, as will be seen below, will be borne by the concessionaire.** As discussed in the previous chapter, the physical forest management program, as developed through the planning sequence, is the basis for the projected and ultimately realized harvest and as it is executed by the operator it should be reflected in the financial flows that should accrue to the government. Just as the forest authority needs to define and enforce a physical forest planning and management process, with inspections, plan reviews, standards and so forth, the government through both the forest authority and its financial agencies needs to establish a revenue management system with comparable controls and enforcements.
56. **The term “revenue management system” here refers to the set of procedures and systems (automated or not) that enable all revenue administration functions.** This includes the processes, institutions and people that identify obligations, undertake collections and provide related services such as dispute resolution and explaining tax obligations. It can be helpful to think of the

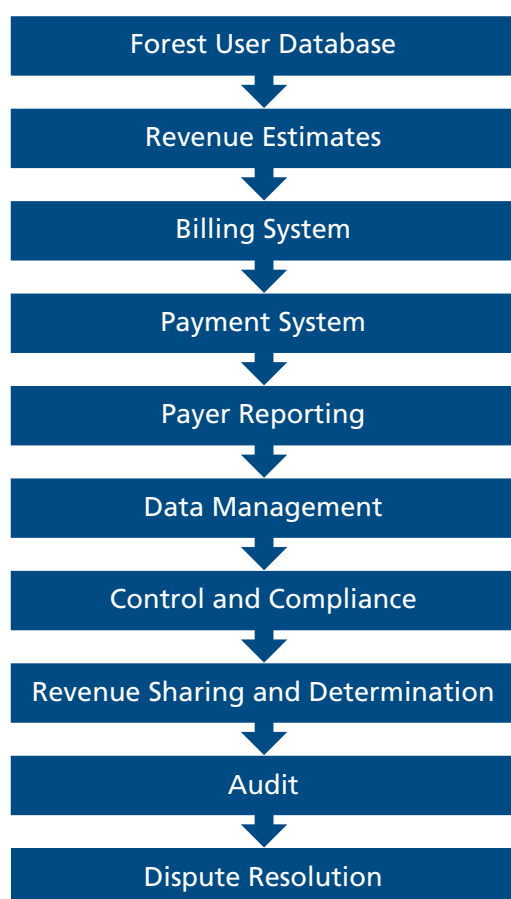
---

<sup>17</sup> This can be an intentional measure to ensure quality and compliance and to create mechanisms for supervision.

<sup>18</sup> There are sometimes suggestions that assignments of various functions to different parties can be done in ways that undermine results by reducing “ownership” of actors expected to follow through on the work of others. Such psychological or cultural influences may occur, but there seems to be no systematic research findings to support the idea that they are important. These hypothesized results could be thought to also apply to the use of consultants by both public and private sector actors, but again research findings are lacking.

revenue management system as encompassing a series of sequential steps, starting with planning/ forecasting and continuing through billing and receipt of payment to audit and finally dispute resolution. Figure 3.1 summarizes the interrelated steps generally agreed to be part of a sound revenue management system. The remainder of this chapter considers each of these steps in more depth, including theory, current practices, and forestry-specific issues, mindful of the particular principal-agent problem that exists in forestry.

**Figure 3.1: Components of a Revenue Management System**



57. **Existing literature and forestry studies have found weaknesses across forestry revenue management systems, with manual processes, poor sharing of information, and lack of skills and staff all contributing to revenue leakage.** Further, the interrelated nature of revenue management systems means weakness in one area, such as inadequate data management, will undermine the effectiveness of other areas, such as estimating revenue potential, billing, reporting, and auditing. Each of these gaps in the revenue management system weaken compliance with sustainable forestry management plans by reducing available resources, allowing under-reporting of logging and enabling corruption. A well-functioning revenue management system, consisting of the steps outlined below, can help mitigate these issues. The overlapping information needs and data generated by both the forest and financial systems can actually be used to reinforce the effectiveness of both in ensuring sustainable and remunerative results.



## Forest User Database

58. **To facilitate proper collection and handling of revenues, countries need a widely accessible, comprehensive database that tracks the location, scale and ownership of forestry concessions and other user agreements. This makes it easy to see who is supposed to be making payments.** A complete and accurate database of user rights and potential revenue is an essential first step in the revenue management process. The absence of a central database makes revenue management extremely difficult and leaves room for illegal activities. Establishing the baseline for potential revenue is the foundation of any well-performing tax administration system. Webb et al. (2017) argues that transparent land-concessions data is essential from a sustainable forest management perspective, such as for understanding the drivers of forest loss and environmental impacts of activities. In terms of revenue management, a central database is critical to formulating revenue projections, coordinating revenue administration and tracking collections. It would be equally important for distributing funds if a government adopts a feebate scheme (e.g. cash rebates for landowners or logging companies that increase carbon sequestration or harvest timber sustainably) (see World Bank 2019a).
59. **A forest user database should include the enterprise name, beneficial ownership, area, size and location (e.g. meters and bounds), operational status, concession issued and expiration dates, a map of the concessional area and company-level financial data, production and sales data, or equivalent information for community-owned concessions.** The requirement for the provision of information should be included in concession contracts, relevant laws and regulations, and the required company-level data should be agreed as part of the concession. Key information includes planned production/processing, projected prices, estimated royalties and other fees. The elements included in the database should be comprehensive enough to cover the key aspects of all forms of concessions and concession-like contractual arrangements (such as community-managed forests) that exist in the country.
60. **Existing forest user databases are often outdated or inaccurate, placing revenue owed to government at substantial risk.** While many countries have something equivalent to a forest user database, they tend to lack accuracy and often are not being used appropriately or efficiently. Where a database involves manual entry, it can quickly become outdated, overlapping, or incomplete, particularly if different components are updated by different agencies or at different levels of government. Local and national authorities both face challenges collecting information. Further challenges arise when different actors in government cannot verify the accuracy of information reported by others in the database. Staff training, regular data audits, and creating incentives for accuracy (potentially through revenue sharing arrangements) can help build confidence in the accuracy of information contained in the database. Box 3.1 highlights Indonesia's efforts to address land use data challenges through the One Map initiative.

### **Box 3.1: One Map of Land Use in Indonesia**

Indonesia's One Map initiative aims to reduce conflicts over land, including disputes over forest concessions, by providing a single database of land use for the entire country. In 2015, the government launched a basic map of the country (at 1:250,000 scale), but as it worked to create a more detailed map (at 1:50,000 scale, eventually launched in 2018) it discovered that more than 16 million hectares had overlapping land use claims (Reuters 2018).

Work related to REDD+ initially prompted the One Map initiative, when it became clear that the Ministry of Forestry and Ministry of Environment were working with very different maps of primary forest in Indonesia (Shahab 2016). As a founding member of the Open Government Partnership in 2011, Indonesia committed to developing the One Map portal. Proponents argue that if information (including on timber concessions) is publicly available and easily accessible, the public can help ensure that new land use rights are not issued over existing ones. The ultimate goal is to synchronize different maps (e.g. of forests, plantations, agricultural areas, and customary lands), and to resolve the conflicts that emerge based on identified overlaps in tenure.

Forest Watch Indonesia has pushed for forest-related information to be more transparent, working with a coalition of NGOs to successfully sue the government under freedom-of-information provisions for data on the country's industrial timber supply and land-clearance licenses (Shahab 2016). A participative mapping movement has attempted to integrate community-provided information on customary land tenure into One Map, but submissions have been rejected on technical and procedural grounds. The work to make Indonesia's land tenure arrangements transparent is therefore ongoing, with significant progress made, but still only certain types of information available to the public to date.

61. **Responsibility for collecting the required data should be the responsibility of the concession-issuing authority, typically the forestry authority.** Consistent with the planning process discussed in Chapter 2, if the forestry authority is undertaking an orderly strategic planning process, with reference to the country's land use policy, it should have access to all the needed data. The database is simply a means to capture, manage and analyze available data more efficiently, systematically and accurately. By having the forestry authority responsible, it is able to ensure data is collected from the commencement of a new concession. Where this occurs at the local government level, resources and training on entering and maintaining the currency of data is required.
62. **An accurate database means little if appropriate and efficient use of it is not woven into other aspects of revenue management.** The database should be an open reference point for various revenue functions, such as billing and auditing. This requires sound business processes as well as sufficient institutional capacity, discussed in Chapter 4.

### **Revenue Projections**

63. **Governments require comprehensive revenue projections from across the entire economy to manage macro-fiscal pressures, prioritize expenditures and ensure policy objectives are achieved.** This information enables a government to plan and allocate expenditure with greater certainty, particularly where commodities form a significant proportion of government revenues and can add to volatility (Guj et al. 2013). Accordingly, governments require an estimate of expected forestry revenue that can be incorporated into budget forecasts.

64. **Long-term, medium, and annual projections factor heavily into the strategic, tactical and operational planning cycles discussed in Chapter 2, and need to include not only projected revenue from concessions, but also from any other forms of timber sales (e.g. roadside sales).** Aggregate long-term projections are important considerations in developing the broader strategic forestry policy that takes place even before concessions are awarded, as part of the government's decision process about where/whether to have concessions and what fiscal instruments to use. For instance, should revenue projections over the longer-term reveal limited revenue gains from depleting diminishing forest, this information should be factored into decisions on future harvesting, policies on land usage, and the type of fiscal instrument used for taxing forestry activities. More detailed medium-term projections inform the medium-term revenue and expenditure framework and support macroeconomic management. For instance, medium-term revenue projections may help manage fluctuating revenues between years given volatile commodity prices. Annual projections at a granular level (i.e. for each forestry-related contract) support the annual budgeting process and enable accurate revenue collection and accounting. Annual revenue projections inform resourcing decisions critical to operational planning.
65. **Formulating sound forestry revenue projections requires inter-agency consultation between the central finance and forestry authority according to an agreed forecasting process and timeline.** Revenue projections generally involve "top-down" analysis, which makes assumptions around aggregate performance of the sector, and a "bottom-up" approach utilizing detailed company-level operational forecasts. Often forestry revenue projections are predominantly top-down, developed by central finance ministries with limited company level information. In worst-case scenarios, revenue projections are simply based on rolling over the prior year's results. Incorporating information from forestry concession holders will strengthen revenue projections. This requires the involvement of the forestry authority in the development of forestry revenue potential, working with the central finance ministry through an iterative process to calculate accurate revenue projections. Consultation on revenue projections, drawing on respective agencies' available information, could take place through joint forestry and finance ministry meetings or other coordination mechanisms discussed further below.
66. **A mechanism for consultations with concession holders on revenue projections should be articulated in the concession agreement and should take place regularly to update production estimates and adjust revenue projections based on current commodity prices.** This is necessary to ensure government estimates are based on the most up-to-date and informed sources, given that concession holders tend to have access to more detailed, timely pricing data (Guj et al. 2013). Often forestry administrations and/or revenue authorities lack the skills and resources to undertake regular checks and data collection to inform forecasts and update forecasts mid-year. It is also important to have a process for reviewing forecasts when conditions change. A mechanism for engaging with concessionaries is useful to capture the financial implications of delays and shortfalls in physical works due to weather, pricing and markets.
67. **The method for formulating revenue projections should be reviewed periodically by comparing realized revenue against revenue projections.** This is necessary to not only improve projection accuracy but to motivate greater accuracy in forecasting and to spot potential leakage/corruption. It is critical however, that a process of building revenue projections on the basis of the physical plan be retained and not replaced by the all too frequent resort of relying on the previous

year's results to simply recur. Often a revenue forecasting process fails to revisit outcomes against projections. Reviews of projections coupled with transparency not only improve accuracy but also provide visibility to and enable oversight of responsible agencies, as discussed further in Chapter 4 on Institutional Arrangements.

## Billing System

68. **A billing system generates a bill (invoice) for or debit of expected revenue, which is the next step in ensuring accurate collections.** Weak revenue management systems may not have a billing system, simply crediting payments when received. A billing system is required to advise concessionaires and other payers of the payment amount and date due. It also ensures the revenue collecting authority is aware of when payments are due, and when unpaid, raise debts for non-payment. Consequently, having even a simple billing system in place is important to ensuring revenues due to government are actually collected.
69. **Forestry concessions involve a range of payments governed by legislation, regulations, and contract terms established well ahead of the actual felling of trees.** Each of these required payments would trigger the billing system to create an invoice (while in the case of roadside timber sales, for example, the sale itself would trigger an invoice). Typically, there will be a sequence of payments that begins ahead of the harvest. For example, a pre-harvest inventory (including the marking of trees for felling) may be conducted and provides the manager and the forest authority with a precise estimate of the anticipated volume of the upcoming harvest, possibly broken down by species, projected grade, and so forth. Based on the established royalty schedule, this would generate an estimate of the payments to be due for the logging season. Based on this estimate, the billing system would generate and deliver a bill to the licensee or concessionaire who would be required to submit some fraction of payment (usually in the range of 10 to 33 percent) prior to the commencement of logging. A further share of the amount due, reconciled to account for more accurate measurement of felled logs, corrections for hidden defects, and other adjustments, would be paid after logging and prior to removal of logs from the forest area (usually at the "second landing"). Ultimately, the full amount for the actual scaled (measured) and graded harvest would be due before the closing of accounts for the logging cycle, with each payment billed prior to becoming due.
70. **The billing system should provide a directory of relevant forest fees, specified in schedules.** The schedules should also set out methods for adjustment of fees for inflation, cost increases and the basis and method of payment (FAO 2001). The schedules provide transparency and clarity as to fees and simplify billing processes.
71. **The billing system could automate the issuance of invoices to forest users when payments are due, assess interest penalties on late payments, and send reminders.** It would also assist with managing when enforcement proceedings for non-payment should commence (FAO 2001). While revenue collection, discussed in more detail below, is often centralized in the central revenue administration authority, the detailed technical knowledge of the forestry harvest processes and related fees and contractual agreements tends to be held in forestry authorities and as such the responsibility for billing systems often rests with the forestry authority. The responsible team in the forestry authority should be arms-length from decisions on awarding concessions and other user rights.

72. **Where billing relies on self-assessment, that is, companies/concessionaires submit their own assessment of the revenue payable, quality assurance by the forestry authority is required.** Inaccurate or fraudulent self-assessment can lead to underpayment and delay revenue collection. The responsible authority should provide reference prices for the calculation of sales revenues to improve consistency and reliability of self-assessments. The basis of the payment calculation should be specified in the bill.

## Payment System

73. **Forestry authorities should have a payment system that is clear and relatively simple, setting out the information required from the payer and a single payment procedure.** A payment system sets out the means of payment and enables the payer to transfer money, as opposed to the billing system, which sets out the amount and date due. The two systems should be reconciled to ensure the full payment is received, noting payments may involve multiple partial payments over time. Bank transfer slips should specify the required information for the sake of consistency and to enable cross-checking. A single payment channel is important to improve revenue management, enforcement, and early analysis of receipts. Typically, payments should be to the revenue ministry, but this can vary depending on the division of revenue administration responsibilities. In any case, a single channel for payment will improve revenue management. Australia has gone a step further in facilitating electronic lodgment of royalty returns as a way of reducing data errors in information provided by companies, and of facilitating the royalty administration process. Whether this sort of IT investment is worthwhile mainly depends on the volume and degree of complexity of relevant transactions in a country (Guj et al. 2013).
74. **At each step in the revenue process, a record should be generated.** The pre-harvest inventory will generate a “tree list” corresponding to a record of the initial payment. A “log list,” which will ideally enable reconciliation with the original tree list, will correspond to records of payments due and log inventory changes at the various landings and storage depots up to the final completion of the sales transaction. Various shipment records, bills of lading, and other records will be generated as part of normal inventory control and operations management. Distribution and retention of copies of these documents and records at various locations and by the various business units and revenue authorities enables prediction of expected revenues, production of exception reports to identify discrepancies between expectations and realizations, and internal and external audits.
75. **Technologies such as optical reading of barcoded labels, various kinds of electronic and visual identifiers, remote electronic data entry systems, and others, are improving tracking and auditing of payments, enabling rapid distribution of virtually real-time information to diverse users within a forestry revenue system.** Generally, the new technologies function to enable accelerated generation of exception reports by replacing paper-based record keeping (which involves considerable scope for error, manipulation and neglect). In principle, users of this information could include licensees/concessionaires, different units within the forestry agency, and concerned authorities in revenue, tax, customs and other agencies. Industrial and public forestry practice in many, especially developed, countries routinely employs such technology. In developing countries practice is much more rudimentary. It is important to note that while new technology cannot simply be superficially added atop fundamentally unsound processes, it presents a significant opportunity to improve forestry payment systems and revenue management more generally.

## Payer Reporting

76. **Sound revenue management requires all concession holders to report their payment obligations, as well as royalties and fees paid, at prescribed times.** Payer reporting, in addition to official record keeping, is an important means to increase accountability, transparency and as a means for forest authorities and other stakeholders to monitor compliance. Standard reporting requirements, including templates, should be available to improve consistency in payer reporting and ease of use. While this paper is focused on revenue management, and hence payer reporting of revenue such as royalties and other fees under the concession, there is a related opportunity to expand payer reporting to include sales and revenue information, including scales and grades of logged forest, in more sophisticated and integrated forestry management information systems, discussed further below.
77. **A single authority should be responsible for setting the reporting standards at the national level—typically the forestry authority in consultation with the central revenue administration.** This improves consistency and reduces complexity for both government and companies. These reports should be shared by the responsible authority with other relevant agencies and ministries in a timely manner to ensure consistency of information and enable performance of respective functions.

## Data Management

78. **A sound revenue management system includes a system for recording the data required for revenue collection, verification, and administration.** Having this information easily accessible in one place is key to carrying out an annual planning process (as discussed in Chapter 2) effectively. Revenue data management should encompass project details, long-term revenue forecasts, company performance, market prices, royalty payments, sales, taxation payments, payments of other fees and charges, audit results, and templates for returns (Guj et al. 2013). While an IT system is not essential, in practice it helps in many ways, particularly in sectors with teams spread geographically and across levels of government and ministries. It should draw information from other systems, such as the forest user database and billing system, to ensure consistency.
79. **Data management systems improve the coordination of forestry-related data, as long as the system is built to meet the needs of the specific country context.** A World Bank study of forestry sector Public Expenditure Reviews found that inadequate data collection is common. Examples of data challenges include fragmented reporting, use of multiple reporting channels, and limited reporting by local government entities. This makes assessment of the effectiveness of revenue collection (and expenditure) extremely difficult (Fowler et al. 2011).
80. **However, good governance will not be achieved through IT systems alone—this will require leadership, political will, resourcing and training.** Studies have found that the introduction of IT is not conducive to reform if the overall environment is not oriented toward strengthening forestry management and governance. A sample of World Bank forestry projects shows that the introduction of computerized information management systems to facilitate institutional reform has had limited success. Forestry administrations undertaking IT reform have been found to have inadequate links between new technology and institutional reform. Often there

is inadequate analysis on how technology can be best leveraged to improve core business processes (Castrén and Pillai 2017). For lessons from Finland, see Box 3.2.

### **Box 3.2: Finland's Adoption of ICT in the Forestry Sector**

*The following is an excerpt from Castrén and Pillai (2017):*

Finland is one of the world's leading countries in applying ICT across all levels of society and different economic sectors. Forests have held a remarkable role in Finnish society for over a century. Alongside the rapid overall development of ICT, forest sector actors have actively developed and applied different ICT solutions to improve efficiency. Conventional ICT applications have been developed to support decision-making and to improve the efficiency of the wood supply. During the past decades, the importance of communication between forest actors and the general public has become an emerging requirement, and new solutions have been introduced in response. ICT solutions in Finland are currently in a transition period to second-generation solutions, with a large proportion of solutions and e-services being revised and improved. The major drivers for this are the changes in the operating environment and the rapid development of hardware and communication possibilities.

In general, the readiness for ICT solutions in the Finnish forest sector is very high, which reduces the need for capacity building and technical support in introducing new solutions. The key success factors for ICT solution development and application processes are the involvement of the stakeholders, adequate capacity, and a high level of trust between the government and the private forest owners. For developing countries, the Finnish model presents two important lessons: (1) good outcomes from ICT solutions can be expected only through a good communication strategy and upfront involvement of stakeholders, and (2) piloting with a smaller user group is beneficial for the final product quality.

*Source:* Excerpted from Castrén and Pillai (2017).

81. **One potentially significant opportunity to leverage IT is with a Forest Management Information System (Box 3.3). Distinct from a Forest Management Information System is a Financial Management Information System covering financial data rather than physical data.** While the Financial Management Information System could benefit from intersecting with the Forestry Management Information System, the need for relatively simple and transparent financial management may lend itself to arguments for separate systems, subject to individual country needs and capacities. Lessons from country efforts to adopt a financial information system in forestry include the need for ensuring that: system components are manageable in size and relatively simple; government staff are adequately trained in the technology and thus able to guide consultants in system design; there is data available and a readiness to improve data collection; the right stakeholders are identified; there are opportunities for the client to test the system throughout the project; and attention is paid to change management and generating buy in from staff at all levels (Castrén and Pillai 2017).

### **BOX 3.3: Forest Management Information Systems**

A Forest Management Information System can consist of multiple layers, including:

- Ownership and cadastral information (from the forest user database);
- National Forest Inventory and growth and yield data, which would monitor the growing stock and condition of the forest (and be used for strategic decision making including projecting gross revenues);
- Forest management plans at the concession level that would specify which areas would be cut and when, lay out the harvesting system and forest road network, set the annual allowable cut, and estimate yields and revenues;
- The annual harvesting plan, which would identify and measure the trees to be cut, plan the skid trails, etc.;
- The removals reports, which would specify which trees were cut when and then measure the actual logs at the landing;
- Transport reports, which specify which logs were moved when and on which truck, and entry into the mill or place of processing or port; and
- Other information relevant to the three-tiered planning process and physical management of forests, with links to revenue administration where appropriate.

By integrating revenue management into the Forest Management Information System, a range of revenue alerts could be triggered when agreed conditions are met (or not), so that the appropriate action is taken. For example, when removals reports are entered, this could automatically generate an invoice for the royalties due. This could then go into an account module that would monitor each concessionaire's bills and payments. Routine queries and reports could be generated to flag defaulters to management and to allow for sending out routine statements, reminders and final notices. Effectively using a full Forest Management Information System has the potential to improve forest management as well as revenue performance.

## **Control and Compliance**

82. **Mechanisms of control and compliance are necessary both in the physical and financial realms to reduce the prevalence of corruption and fraud.** Control and compliance mechanisms reflect the reality that it is not enough to design good policies, contracts, and revenue collection systems; successful implementation requires ongoing monitoring. Forestry activity and related revenues can be corrupted in many ways, including misreporting or under-reporting wood volumes, unit values, species, grades, and qualities. Establishing and maintaining robust revenue management procedures can help reduce the prevalence of corruption, along with building and maintaining honest and ethical workplaces and operations, discussed in the following chapter.
83. **On the physical side, government officials need to ensure that activities are legal and according to plan—a demanding task for the forest authority.** Measurement, Reporting and Verification (MRV) of greenhouse gas emissions under REDD+ also necessitates a reliable forest monitoring system. Field supervision requires a cadre of staff trained to properly observe and evaluate a wide range of activities and works ranging from, as examples, tree felling to bridge building. The overriding principle behind supervision of field operations is that operations should be acceptable to the forest authority if they are specified in an approved operational plan and if they



are implemented in line with an acceptable level of technical quality as defined by regulations or a relevant Code of Practice. Should field inspections identify deviations from planned (i.e. approved) activities or qualitative shortfalls, the forest authority will have a number of alternatives. These include measures such as: remediation or corrective orders, calling on the concessionaire to address deficiencies; stop work orders, prohibiting the concessionaire from further work until conditions to be specified in the order are met; criminal charges; and damages and financial penalties. Many of these issues would have implications for revenue and charges owed.

84. **On the financial side, analogous and related systems of control and compliance are required, in this case to identify instances of under-payment and non-payment. A sound revenue management system will incorporate key controls that enable administrators to easily identify compliance or non-compliance.** A system should also be able to identify variations from expected payments by raising “red flags” and generating exception reports (Magrath et al. 2007). This information could then trigger further investigation or audit processes. Simple policy adjustments can also potentially improve compliance; in Ghana, for example, a policy change mandated that any outstanding fees be paid before timber permit renewals would be approved (World Bank 2014c). Responsibility for monitoring and auditing the system should be clearly assigned to the administrator of the revenue system, noting that discrepancies can creep in at various levels. The outcome of control and compliance processes should inform tactical and operational planning (as discussed in Chapter 2), with governments making adjustments as needed if concessionaires are not following agreements and procedures.
85. **Automation of the controls and compliance process is necessary in large forestry sectors to manage what can potentially be a large number of payment reports and supporting documents.** Poorly resourced forestry agencies can have limited capacity to ensure compliance with payment schedules and as such an automated payment process can be effective at improving revenue collection. Further, reconciliation of documents needs to occur along the forest management, timber harvest, transport, and delivery chain, requiring significant resourcing at various levels.
86. **A further challenge can be confusion over the responsibility for control and compliance across agencies, and between central and local governments.** This ambiguity should be managed through delineation of clear roles and responsibilities for payments (as discussed further in Chapter 4 under “Institutional Structures”). Similarly, clear authority to enforce punitive sanctions for non-compliance should be in place, including scope for cancelling contracts.
87. **Finally, third-party compliance systems such as certification agencies are playing an important role in strengthening controls and compliance.** Certification organizations such as the Forest Stewardship Council (FSC) monitor the chain of custody and verify sustainable practices in forestry, helping to ensure products come from responsibly managed forests that provide environmental, social and economic benefits. <sup>19</sup>This role is not easily replicated in public authorities and is thought to have a significant impact on consumer behavior and accountability in the forestry sector, though a rigorous evaluation would provide more insight into the impact of certification on sustainability (Romero et al. 2017). For more on the role of the certification process, consult World Bank (2019a, 2019b).

---

<sup>19</sup> For further information see <https://us.fsc.org/en-us/certification>.

## Revenue Sharing and Determination

88. **Forestry revenues are often shared across central and local levels of government where forestry activity takes place. If this is the case, the revenue management system must include mechanisms for revenue sharing and determination.** The theory of revenue sharing and the modalities for revenue distribution to its ultimate beneficiaries are beyond the scope of this paper, but hypothecation of specific revenue heads is generally discouraged as it erodes the pool of consolidated revenue available for prioritization across government's competing priorities. However, where such revenue distribution arrangements exist, operationally detailed revenue information is required to ensure accurate payments. This underscores the importance of carefully recording information including type and source of all incoming forestry-related payments, which falls under "Data Management" above, as funding allocations are often based on this information. All distributions of forestry revenue must be based on data and transparently recorded.
89. **The central finance ministry should administer revenue-sharing arrangements, transferring funds on a regular basis to ensure adequate resources and facilitate sound expenditure management at the local government level.** Making adjustments in processes may be required to improve efficiency. In Ghana, the speed of distributing royalties increased when funds were directly allocated to districts on a quarterly basis rather than transferring them through regional governments (World Bank 2014c).<sup>20</sup> Emphasis is often placed on distribution arrangements and calculations as opposed to ensuring compliance and increasing the total collections. It is necessary to ensure that agencies have sufficient resources for both activities (as discussed further below in Chapter 4 under "Adequate resourcing and capacity").

## Audit

90. **A strong financial auditing capability is an important component of a sound revenue management system.** A well-functioning systemic audit program is essential to ensuring accuracy, fairness and transparency. Audits can take the form of desk or full field investigations. Systemic audit programs are particularly important where companies, including in the forestry industry, base payments on self-assessment. Audits should be undertaken by an agency at arms-length from concession arrangements, collections and revenue administration (see also World Bank 2019b for discussion of the role of independent auditors, including for financial and non-financial audits—e.g. of compliance with regulations and forest management plans).
91. **Resource constraints mean audits tend to be undertaken on a sample of companies, rather than all companies.** This enables more comprehensive audits of high-risk companies. Companies should be legally required to respond to audit requirements. In some cases, special audits, possibly conducted with outside advisors or consultants, will be needed (Magrath et al. 2007).

<sup>20</sup> Revenue sharing and the enabling institutional arrangements can be complex. In Ghana, "...many land ownership rights are vested in traditional authorities, while the right to manage forests is retained by the state. The royalty payment on trees ("stumpage fees") is thus shared equally between the government (of which half is retained by the Forest Commission as internally generated funds while the remainder is paid to the Treasury) and traditional authorities. The half distributed to traditional authorities are paid out through the Office of the Administrator of Stool Lands; of this half 25 percent are distributed to traditional chiefs (the "stool chief"), 55 percent to the district assembly, and 20 percent to the traditional council. These shares are calculated after forest commission management fees and 10 percent for the Office of the Administrator of Stool Lands. Of revenue from plantations, 41 percent goes to the government while 59 percent is then split between local authorities and the forest commission in the same proportional manner." (World Bank 2014c)

92. **The absence of comprehensive data on actual revenues in forestry makes audits extremely difficult.** The World Bank study of Forest Sector Public Expenditure Reviews found poor monitoring and audit of collections, revenue arrears, a lack of methodology for the tax rates applied, a shortage of comprehensive information on revenues, and a lack of transparency in the use of revenues (Fowler et al. 2011).
93. **Common errors identified in audits should be communicated to the broader industry to prevent reoccurrence.** Communication of key findings and lessons to both companies and local government (where audit is conducted centrally) will improve financial management practices across the industry. Further, audit findings need to be followed up with the relevant company and relevant level of government to ensure findings are addressed and penalties applied to deter non-compliant activities.
94. **An autonomous or semi-autonomous audit agency can strengthen revenue management in forestry, as with other sectors.** The presence of a rotating, full-time auditor in large-scale operations has been found to be effective at improving financial reporting and compliance in the mining sector of some countries. Where this is beyond the scope of available resourcing, third party audit capabilities could be contracted.

### Dispute Resolution

95. **A dispute resolution mechanism is a structured process established to address disputes between parties engaged in business, legal, or societal relationships (FAO and EFI 2018).** All stakeholders benefit from the existence of a sound dispute resolution mechanism, which builds trust and confidence in the industry, and provides a means to resolve concerns for communities, companies and the government. Beyond resolving disputes, a process of dispute resolution also allows issues and concerns to be brought forward, supporting an open and transparent sector. A complaint system is therefore a critical component of a dispute resolutions system and important for a well-functioning revenue management system.
96. **Conflicts can be routine and often legitimate and acceptable, making a reliable, efficient system for dispute resolution essential.** Effective dispute resolution mechanisms will help build trust among parties in the sector. Having the opportunity to appeal regulatory and revenue related decisions is important for firms and encourages transparency. Disputes can arise in a variety of cases and circumstances, including in the criminal, civil, contractual, and regulatory spheres, which necessitates a dispute resolution system that can respond with appropriate penalties and remedies.
97. **Conflict in the forestry sector can be a failure of both the legal system itself, and its implementation.** Rosenbaum (2004) identifies failures of law as those where the rights to resources in law are not the same as the rights people or communities believe they have. Failures of implementation include poor dispute resolution, unfair application of the law and a lack of capacity to administer the law. Each of the factors exists in varying degrees in forestry sectors.
98. **Forestry concession contracts should include a clause stating the mechanism(s) for resolving disputes, which can include negotiation, mediation, court proceedings, or arbitration.** Arbitration is often considered an efficient approach, but international disputes can involve significant costs, which is challenging for governments with limited resources. The Columbia Centre on Sustainable Investment recommends, to mitigate these concerns, that

contracts stipulate that arbitration can only be used by the parties after they have attempted to resolve the dispute using all available domestic remedies (Columbia Centre on Sustainable Investment 2015).

99. **FAO (2018) sets out detailed guidance and recommendations for governments seeking to strengthen dispute resolution mechanisms.** These include: clear procedures; community participation; clarity of roles and responsibilities; impartiality; consideration for cultural differences such as the attitudes of communities towards direct or indirect negotiation; applying the FAO manual on Free, Prior and Informed Consent; permitting third parties, independent participation and verification in dispute resolution mechanisms; and promoting the use of mediation by third parties and civil society groups. Advice for concessionaires includes to create channels for the early identification of concerns, and to involve communities.

### **Evaluating Country Revenue Management Systems**

100. **Taking stock of an existing revenue management system is the first step in setting priorities for new initiatives or reforms.** This paper presents a new diagnostic questionnaire (Annex 2) to assist governments in undertaking such an evaluation. This can be used on its own as a first step at a revenue management diagnostic; countries may also find the much broader and more comprehensive DIAMOND tax administration diagnostic tool offered by the World Bank to be relevant (see Annex 2 for an overview). By working through the questionnaire, authorities and their partners can identify priority gaps or weaknesses in existing revenue management systems and use this as a basis for a plan of action to address them.
101. **This chapter has focused on the mechanisms and systems that facilitate revenue administration. The following chapter moves to the institutional factors that can affect the success of revenue management efforts.**

## CHAPTER 4: INSTITUTIONAL ARRANGEMENTS

102. **This chapter considers how institutions should be organized and resourced to support revenue management in pursuit of sustainable forestry.** Considerations include institutional structures that promote coordination between forestry agencies and the central finance ministry, sufficient resourcing and training to support sound revenue management practices, and mechanisms to support anti-corruption efforts, stakeholder engagement and transparency. Given the diversity of country experiences, no single institutional model is recommended. Rather, lessons are drawn from a range of countries and extractive sectors to propose various options that may suit a particular country and forestry context.
103. **A range of administrative models exists for revenue management in the forestry sector.** The appropriate structure will depend on factors including how revenue is managed across the whole of government, the distribution of revenue responsibility across levels of government, the relative power and influence of agencies and ministries, and the stage of development of budget and revenue collection systems, transparency and coordination. Responsibility for revenue policy and administrative functions in forestry can be assigned across forestry agencies, the central finance ministry, or a mixture of both.
104. **There is no single model for revenue management.** While it is common for institutional reform to be seen as part of the governance solution and broad principles guiding organizational setup can be useful (see Box 4.1), it is increasingly accepted that there is no single model for revenue management that is necessarily optimal (World Bank 2005). In Belarus, for example, all forests are state-owned and managed, and the sector is dominated by state forestry enterprises, with limited private sector involvement. According to a World Bank policy note prepared in 2013, a number of institutional reforms would be beneficial, including engaging stakeholders in sectoral planning; leveling the playing field for companies of all forms of ownership; making all sales transactions transparent; creating a separation in institutional roles for forest management, policy/legislation, and control; and strengthening economic analysis of the trade-offs among different benefits provided by forests (World Bank 2013). However, even with its current institutional configuration, Belarus achieves impressive results in forest management. It has enhanced the economic performance of the state forest enterprises through more intensive silviculture that has also improved forest health and the quality of the residual stand, its growth and the value of later thinnings, and through the use of competitive commodity exchange auctions. Forests are well-managed and illegal harvesting is virtually non-existent (estimated at 0.1 percent or less of the total). Forest management is mostly financed via sectoral revenues, with only 33 percent of costs contributed by the state budget. At the same time, Belarus has implemented an afforestation strategy, increasing forest cover from 35 percent of the country in 1994 to 39 percent in 2013.

#### **Box 4.1: Effective Extractive Industries Tax Administration**

*The following is an excerpt from IMF (2012):*

The same broad principles of organization and procedure apply in relation to Extractive Industries (EI) as for tax administration generally, and there are the same broad capacity needs. Organizationally, this means integration of administration within a functionally-based structure. Procedurally, it means: clear rules of application, consistent with those of the rest of the tax system, ideally set out in a tax procedure code; separation of duties to safeguard integrity; efficient, effective routine processing, with filing based on self-assessment; active enforcement of registration and payment; selective risk-based audit; effective, accessible dispute resolution; and comprehensive taxpayer service programs to foster voluntary compliance. In terms of capacity, good analytical, audit and legal skills are vital, supplemented by development of specialist EI skills and knowledge. But since most EI tax is usually paid by a few companies, only a small number of professional staff is required. In some countries, however, such as those recovering from conflict, there may be no realistic prospect of developing adequate skills in the short term; outside expertise may need to be bought in, particularly to assist with more difficult functions such as audit and mineral valuation (raising standard issues relating to the development of in-house capacity).

Although weak, fragmented administration is the main barrier to transparency and effectiveness of EI administration, there may be major political and practical obstacles to reform. The IMF found the extractive industry regulators "...are often reluctant, with strong political support, to give up their roles; governments often build up greater expertise and capacity in those agencies than in tax departments (and pay them more), and may object to the disruption and risk of transferring fiscal responsibilities. Those responsibilities may be built into legislation, contracts, international agreements, even constitutions. Change may be needed to EI legislation and agreements, not just tax legislation. Companies may prefer oversight by a commercial partner that "understands the industry." These difficulties may make it necessary to settle for second-best options, however inadequate they are likely to be. It may be futile, for instance, to recommend integrated administration as a near-term objective in practice. Second-best options would then include clearer delineation of fiscal roles between the tax authority, EI regulators and National Extractives Industry Company; improved cooperation and information sharing; and at least centralization of accounting and reporting responsibilities within the finance ministry.

*Source:* Excerpted from IMF (2012).

#### **Guiding principles for institutional arrangements**

105. **While structures can vary, six principles are proposed here as essential to sound revenue management.** These include the need for: (i) clearly assigned roles and responsibilities; (ii) centralization of revenue policy and management functions; (iii) coordination between forestry agencies and the central finance ministry; (iv) sufficient resourcing of forestry authorities to address capacity constraints; (v) deterring corruption in forestry organizations and building an ethos of sustainability; and (vi) stakeholder engagement to improve sectoral performance and accountability.

## **(i) Clearly assigned roles and responsibilities**

106. **More important than a particular structure is that roles and responsibilities are clear and agencies are held accountable for their functions (Guj et al. 2013).** In revenue theory, revenue administration and collection is generally kept separate from other administrative and regulatory functions. However in forestry a case has been made for forestry authorities to retain forestry revenue administration functions to incentivize enforcement (discussed further below). Under both scenarios, the roles and responsibilities should be clearly defined and specified for each agency or ministry in legislation or regulations to avoid duplication, complexity and corruption.
107. **Institutional arrangements in the forestry sector often duplicate functions across agencies and levels of government.** This adds to the cost and complexity of revenue management. In some cases, there appears to be little interest in reforms that provide clarity in roles and responsibilities (Cerutti et al. 2010). Further, clarity does not imply absence of redundancy. Moreover, a forestry agency may have clarity in their responsibility for conducting various checks (on inventory, tree marking, scaling, grading, etc.) but unless conducted with sufficient skill, regularity and knowledge, the responsibilities may not be managed effectively. A combination of clearly assigned roles and resourcing, discussed further below, to meet them is needed.
108. **A related issue is the level of authority given to forestry authorities.** Forestry tends to be given a relatively low profile in ministerial appointments, which may weaken their influence in budgetary and revenue considerations. For example, the majority (90 percent) of European forestry agencies report directly to a minister, whereas in Western Africa only 11 percent do. The result is forestry agencies lacking staff and authority to operate effectively in the concessions marketplace (van Hensbergen 2016). Ensuring an appropriately senior leadership model is adopted, with access to a minister, may assist with improving institutional coordination and performance. While it is unlikely a forest ministry will have authority equivalent to a central finance ministry, for instance, it is important that senior ministers appreciate the role of forestry and environmental considerations more generally, which may be achieved through closer coordination between the forestry and finance authorities.
109. **A review of roles, functions and authority as prescribed by laws and regulations may be necessary to identify duplication and opportunities to more clearly delineate roles and responsibilities.** The forestry revenue management diagnostic questionnaire (which could be used as a complement to the World Bank's DIAMOND tool) in Annex 2 can assist countries seeking to undertake such a review. The tool identifies roles and responsibilities and recommends steps to ensure functions align with sound forestry and revenue management. Proposals to shift responsibilities for revenue management are often controversial. Support from senior forestry authority and finance ministry leadership will be necessary to enable reforms to institutional arrangements, and may still face significant opposition. Demonstrating the potential gains from institutional reform will be required.

## **(ii) Allocation of revenue functions separate from physical functions**

110. **While it is generally considered good practice in public financial management to have the actual revenue collection solely the responsibility of the Treasury or finance**

**ministry, the dispersed and specialized nature of forestry means decentralized forestry revenue management may be justified.** This is often considered the case where local people or communities have some form of forest ownership or user rights. It may also be appropriate where the forestry administration is collecting revenue to cover local administrative costs associated with service provision, including the cost of revenue administration itself. In cases like this, there should be an objective appraisal to determine how much revenue should be shared with central agencies or retained locally (World Bank 2008). Finally, many in the forestry sector argue that decentralized revenue administration to the forestry authority can be necessary to create stronger incentives for collection and enforcement. The absence of decentralized revenue responsibilities to the forestry authority or local government level may severely curtail domestic resource mobilization and oversight of harvesting activities. While incentives to perform enforcement functions should arguably be addressed through performance management, the level of decentralization of revenue management will depend on the particular country context and relative levels of governance at the central finance, forestry authority and local government levels.

111. **Where forestry authorities and local governments collect forestry revenue, a clear separation of responsibilities is required between physical and financial functions.** For example, the team responsible for issuing concessions should be separate from those determining fees due and those undertaking audits. This is necessary to ensure appropriate safeguards and oversight of revenue-related decisions. The ability to achieve separation of responsibilities will depend on the size of the industry and government resources, as there is generally a limited number of professional staff with financial and auditing skills available in the responsible agency (Guj et al. 2013).
112. **However, decentralized revenue collection and retained revenues by the forestry authority or local level government comes with risks, as there is typically less capacity and oversight at lower levels of government.** Accordingly, improving forestry revenue management comes with the need for additional resources, capacity development in revenue management and an active civil society to strengthen oversight. Each of these elements are discussed further below. As discussed in Box 4.2, centralized and decentralized revenue models have different risks and benefits, all of which necessitate a range of measures to reduce corruption along the entire supply chain.
113. **With decentralized collection, governments may decide that subnational governments should retain a proportion of forestry revenue.** At the same time, it is important to consider the optimal way to use the available fiscal instruments to achieve multiple objectives, including environmental outcomes. For instance, retention of local revenues can form part of a government's revenue distribution policy, ensuring a share of revenue accrues to areas where resources are being extracted, benefiting the local community and providing an incentive for local industry. In some countries, however, equity and other policy objectives can be achieved through other revenue distribution models, while reducing the risk of corruption and capacity constraints at the regional and local levels of government. Alternative approaches could include national fiscal equalization policies or revenue-sharing agreements whereby revenues are still collected at a single level of government to promote efficiency and transparency, while ensuring local communities benefit from revenue generation. Environmental Fiscal Transfers to encourage local governments to pursue sustainability-oriented policies is another option (World Bank 2019a). Ultimately the right revenue policy and



administration model will depend on the particular country circumstances, and detailed consideration of the economic and distributional impacts, incentive effects, local capacity and political economy.

#### **Box 4.2. Centralized versus Decentralized Revenue Management - Lessons from Mining**

*The principles of revenue management in the mining industry can also be considered in the context of forestry. The following is an excerpt from Guj et al. (2013):*

At one extreme, in countries where the process of levying mining royalties and taxes is centralized, the redistribution of the related revenues to the benefit of regional communities is achieved through the government budgetary process. This is often the case in developing countries, particularly in Africa. Advocates for this fiscal approach contend that central government has not only greater institutional capacity but also has the advantage of smoothing the cyclicity of mining revenues, by virtue of having more diversified revenue bases relative to lower levels of government. Advocates also argue that centralization of revenue collection and redistribution through budgetary processes facilitates macroeconomic planning, especially in countries that are highly dependent on mineral revenues. Some, however, argue that in many cases this approach has not resulted in a fair distribution of mineral royalties and taxes back to the regions that experienced the direct impact of mining operations. This has sometimes been the source of discontent in the regional communities and has created political pressure resulting in the current trend towards decentralization (ICMM 2009\*).

At the other extreme are countries where mining revenue collection is decentralized to different levels of government. In a federation, the separation of roles and responsibilities between central and state governments is generally enshrined in the constitution. For example, corporate income tax may be a federal government responsibility, while land-related issues, including mining regulation and administration, may be the responsibility of, and legislated by, state or provincial governments. The jurisdiction in which the mineral rights are vested tends to be the predominant factor in determining which level of government collects mineral royalties. This is a form of compromise, as financial resources are redistributed to broadly defined regions rather than the individual communities directly affected by mining, which would in general not have the administrative capacity to effectively and efficiently collect revenue. There are examples of both successful and unsuccessful decentralized systems.

*Source:* Excerpted from Guj et al. (2013).

\* International Council of Mining and Metals. (2009). Mineral taxation regimes: A review of issues and challenges in their design and application. Commonwealth Secretariat.

### **(iii) Coordination between forestry agencies and the central finance ministry**

114. **A coordinated approach is needed.** Policy skills, technical expertise, implementation capability and administration skills are required to manage forestry and revenue, and yet rarely exist in a single forestry ministry or finance ministry. Interdepartmental cooperation is essential (Guj et al. 2013). The unique nature of the forestry sector means that sound revenue management requires a mixture of skills not necessarily found in one agency. This can mean the orthodox

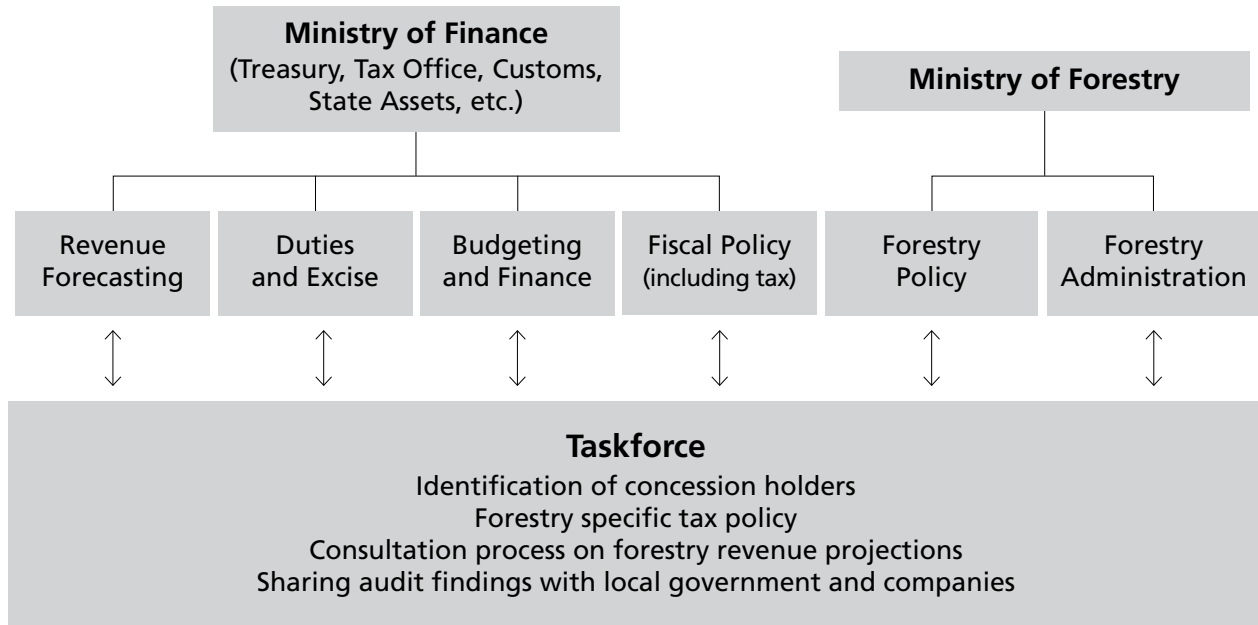
recommendation in public financial management of a single, centralized budget process does not account for the complexity of forestry management and is inadequate for the budgeting challenges posed by related issues such as climate change. As a starting point to addressing these challenges, close collaboration between central finance and forestry agencies is necessary to ensure effective fiscal policy and revenue management. More advanced approaches include climate budgeting, which involves putting systems in place to ensure accountability to environmental objectives in budgeting rules.<sup>21</sup>

115. **Improving coordination between forestry agencies and the ministries of finance, so that everyone works from the same plan, has the potential to improve their effectiveness, avoid duplication of effort, and achieve the strategic, tactical and operational goals set out for a nation's forestry sector.** The World Bank's work on governance of the mining industry found that administrative efficiency is best achieved when governments minimize administrative complexity and compliance costs. This is applicable to the forestry sector, where the commercial viability of sustainable logging cannot be assumed. Ensuring the institutional structures limit complexity and minimize compliance costs is important to promoting a viable and sustainable forestry industry.
116. **Institutional cooperation and coordination can be achieved through data sharing between forestry and finance ministries, sharing resources and even staff exchange to build understanding and communication, and establishing task forces to bring groups together.** Through these mechanisms the forestry sector would benefit from greater shared knowledge about the forestry industry, including its revenue potential, and build a pool of staff with skills in forestry and finance that could be shared between agencies (Guj et al. 2013).
117. **Coordination can be achieved through the establishment of a taskforce or inter-departmental committee (Figure 4.1), and through open data, to share expertise and information across concerned agencies and with the public.** More formal structures could include a division of natural resources in the finance ministry, working closely with the forestry authority. With roles and responsibilities clearly defined in legislation and administrative orders, ensuring ministries coordinate where functions have complementary roles is critical. Examples include in formulating revenue projections, revenue reporting and audit processes. This process can be supported through the establishment of a taskforce to share information, resolve issues and strengthen capacity through shared skills. Senior representation from participating agencies on the task force should be required with forestry and finance ministries potentially co-chairing quarterly meetings. More regular working group meetings should be scheduled to resolve ongoing issues.

---

<sup>21</sup> See World Bank (2014a) and World Bank (2014b).

**Figure 4.1: Clear delineation of functions and coordination is critical**



**(iv) Adequate resourcing and capacity**

118. **Forestry institutions often argue they are under-resourced.** Revenue administration entails costs, and forestry sector government officials need to be equipped to approach its challenges rigorously. Failing this, they will be marginalized (as they often are) in central agency revenue discussions and, by extension, in revenue allocation decisions, which then continue to marginalize the sector and threaten the preservation of natural forests relative to other land uses.
119. **Low levels of budget resourcing to the forest sector have been attributed to the sector's failure to make a convincing case for an increased share of resources.** The economic and commercial value of forestry is often underestimated, in part due to the way forestry is calculated in terms of contribution to GDP. Many outputs from forestry are excluded from this calculation, reducing the perceived value of the sector in budgetary terms and consequently reducing political will to support the sector (Fowler et al. 2011).
120. **In theory, governments should be prepared to spend on taxation administration until the net marginal return becomes less than the return obtainable from the most attractive alternative use of their financial resources (Guj et al. 2013).** However, forestry funding is unlikely to attract funding of this scale. The OECD found that less than 2 percent of collected forestry revenue is being spent on the related government administration. To manage the gap between theory and practice, it has been suggested that royalty systems be developed based on an assumption of around 5 percent of the collected revenue being spent on related management and administration costs (including all costs of system development, administration, and audit) (Guj et al. 2013). Ultimately, how much revenue is allocated to related forestry expenses will depend on competing spending priorities and the perceived effectiveness of spending on forestry management. Applying the steps outlined above, including sound forestry planning and revenue management practices which demonstrate improved domestic resource mobilization, may go some

way to improving the case for retaining a larger amount of forestry revenues for implementation and administration.

121. **The resource and capability limitation of many forestry authorities has implications for their ability to adopt systems and reforms to improve revenue management.** This is an important consideration in designing and/or supporting reform efforts. Box 4.3 reveals lessons from revenue reform efforts in Tanzania's forestry sector that proved difficult, with poor outcomes attributed to resourcing, internal capabilities and diminishing political support for reform.

**Box 4.3: Lessons from a World Bank forestry revenue project in Tanzania**

The resourcing requirements of sound revenue administration should not be underestimated. A World Bank-funded project in Tanzania, for example, that aimed (among other objectives) to strengthen revenue collection ran into implementation and sustainability difficulties for reasons including government procurement delays, lack of institutional capacity to adopt the agreed systems, and insufficient funding after the project closed to maintain adequate patrol vehicles and staff per deims for forest surveillance. The pilot roll-out of an IT system for revenue collection failed due to skills gaps, computer viruses, and unreliable electricity. A key lesson learned was that a reform agenda depending on the buy-in of certain individuals is at risk if those individuals depart and political will declines, especially without sufficient flexibility in project design to adapt to such changes.

*Source: World Bank (2011).*

**(v) Deterrence of corruption, and institutional ethos around sustainability**

122. **Improved revenue management requires a transformation of forestry organizations.** Improved revenue management requires better revenue data, systems and enforcement across institutions. However, to use and benefit from improved revenue management systems, organizations need to transform their culture to deter corruption and build an institutional ethos around sustainable forestry management. Magrath et al. (2007) identifies three fundamental elements for fraud prevention and deterrence: (1) creating and maintaining an organizational culture that values honesty and ethics; (2) evaluating the risks of fraud and implementation of risk mitigation processes, procedures, and controls; and (3) continuing vigilance from oversight processes and designated accountability mechanisms (Magrath et al. 2007). With respect to oversight processes, open data, stakeholder engagement and a greater role for civil society, discussed further below, all have a role to play in reducing corruption and improving forestry authority performance.
123. **Corruption takes many forms in forestry organizations and is a particular challenge in relation to revenue management given the access of officials to funds.** Other related issues such as informal payments can undermine the integrity of the revenue management system. Karsenty (2016) notes increases in the "parafiscalité" (taxes or "contributions" not planned in the Finance Law but created at the administrative level) that in some countries such as the DRC and Cameroon are encroaching on the formal taxation regime. Karsenty (2016) points to ministries facing difficulties getting access to budgetary allocation for investment and functioning, and as

a result many administrations use, and often abuse, their prerogatives to levy specific monetary contributions. Many companies find themselves paying a lot of “contributions” to officials, with little entering consolidated revenue or the Public Treasury. While this situation may be a result of inadequate resourcing of forestry authorities, appropriate fiscal policy (including expenditure to support sustainable forestry administration) and strengthened oversight and distribution of revenue collection will improve the overall functioning of the forestry sector with fewer “contributions” at the administrative level and reduced corruption.

124. **Changing organizational culture requires the leadership of senior management, recruiting and hiring of honest employees and separation of responsibilities.** For instance, it requires separating functions involving financial recordkeeping and reporting, audit and contracting. Improving forestry operations, such as via documentation, reporting systems and standardizing practices, has a role to play (Magrath et al. 2007). Box 4.4 sets out clear steps to minimizing corruption in tax administration that can be adapted to local forestry administrations and central finance ministries contexts.

#### **Box 4.4: Minimizing Corruption in Tax Administration**

*The following is an excerpt from Guj et al. (2013):*

Corrupt practices in the administration of revenues can result in a significant reduction in funds available for government, through either the siphoning off revenues received or the under-collection of revenues being facilitated and/or sanctioned by persons receiving inducements. There are three ways of minimizing such risks:

##### **1. Reduce opportunities for corrupt behavior going undetected by:**

- Minimizing the discretion of ministers and officers. Set out rules, procedures, and definitions clearly and unambiguously in legislation or in manuals.
- Making decisions on any remaining discretionary matters transparent, with a statutory requirement for the minister or officer to give reasons for their decisions.
- Having a non-tax-assessment agency (often Treasury) do forecast estimates of mining revenues expected to be received on, say, a half-yearly basis and seeking explanations for differences with actual revenues received.
- Having tax-assessment officers (if there is not a self-assessment regime in place) separate from tax collection officers (often attached to Treasury).
- Having IT systems in which production data and payment data are capable of being interrogated by more than one officer or departmental section.
- Having payments made electronically.
- Having independent internal and/or external auditors undertake random audit checks.

##### **2. Reduce incentives for corrupt behavior by:**

- Employing key government officers with pay and conditions that recognize the importance of their role, and encourage a sense of pride in doing public service.
- Seeking to reduce the gap between the salary key officers can earn in government versus industry, thus reducing the incentive for such officers to actively seek out employment in industry or to accept inducements.

### 3. Ensure there are significant penalties for breaches of ethics by:

- Having an explicit Code of Ethics that applies to officers dealing with the resources industry, setting out what is expected and what is unacceptable behavior.
- Having an enforcement regime that imposes significant, timely, and evident penalties for behavior that breaches the Code.

Source: Excerpted from Guj et al. (2013).

#### (vi) Transparency and stakeholder engagement

125. **Increasing transparency and stakeholder engagement in forestry first requires improved data availability and accessibility as a necessary though insufficient condition.** Disclosure of concession data varies significantly by country. A survey of fourteen forested countries undertaken by the World Resources Institute found that concessions data was more accessible for mining than for the logging industry (a summary of national regulations related to concessions data disclosure is presented in Table 4.1) (Webb et al. 2017). Further, while comprehensive spatial data exists, limited access is made available to the public, and where data is published, it often fails to meet open data standards.
126. **Open data and technology present opportunities to improve control and compliance, enabling civil society to continue to build its already critical role in pursuing sustainable forestry.** Rapid advances in technologies such as remote sensing provide the means to estimate and monitor forest cover, though operationalizing remote sensing in government operations faces institutional, financial, and political challenges (Petersen et al. 2018; Takao, Priyadi, and Ikbai Nursal 2010). However, countries such as Brazil, Canada, and Peru are leading the way in using technologies like remote sensing, satellite and airborne data technologies to map, classify and track forest health and inform law enforcement efforts.<sup>22</sup> Global Forest Watch<sup>23</sup>, managed by the World Resources Institute, is a public online platform created by a broad coalition of international partners that provides near-real time data on changes in forests. It is used for monitoring by forest officials around the world, as well as journalists, researchers, NGOs, and others. Engaging civil society in the adoption of technology, open data policies and consultations more generally will improve control and compliance activities and ensure civil society continues to play its critical role in scrutiny of the forestry sector.
127. **Extending the Extractive Industries Transparency Initiative (EITI) to cover forestry could be a way to bring international and national partners together to improve data availability and public scrutiny.** EITI requires implementing countries to publish information related to contracts, production, operating costs, and revenues generated in the oil, gas, and minerals sectors, in the interest of facilitating public oversight and government accountability for the use of revenues generated. Thus far, \$2.5 trillion in revenues have been disclosed via EITI reports. Because EITI is supported by a coalition of government, companies, and civil society in each implementing country, joining EITI also means creating a platform for stakeholder collaboration. Of EITI's 52 country members, only Liberia has extended its EITI reporting to the forestry sector. Myanmar has announced its intention to do so.

<sup>22</sup> See <https://www.nrcan.gc.ca/forests/measuring-reporting/remote-sensing/13429> and Petersen et al. (2018).

<sup>23</sup> See [www.globalforestwatch.org](http://www.globalforestwatch.org).

**Table 4.1: Presence of National Regulations Related to Concessions Data Disclosure**

Country	Does the country have a national FOI law?	Does the FOI law include specific exemptions that could be used to deny access to concessions data?	Have any laws / policies / regulations been used to deny access to concessions information?	Do national law policies /regulations require the release of logging concessions data?
Brazil	Yes	Yes	Yes	Yes
Cambodia	No	N/A	No	No
Canada	Yes	Yes	No	Yes
Colombia	Yes	Yes	No	N/A
Indonesia	Yes	No	Yes	No
Liberia	Yes	Yes	No	Yes
Madagaskar	No	N/A	Yes	Yes
Malaysia	No	N/A	No	No
Mexico	Yes	Yes	No	No
Myanmar	No	No	No	No
Peru	Yes	Yes	No	No
PNG	No	N/A	No	Yes
ROC	No	No	Yes	Yes
Russia	Yes	No	Yes	No

Source: Webb et al. (2017).

128. **Non-government organizations (NGOs) have an important role to play in improving forestry revenue management.** In some cases the unreported contribution of NGOs is potentially offsetting low levels of government funding in the sector (Fowler et al. 2011). Civil society are also filling gaps in concession information, through digitizing paper documents, compiling leaked information, and publishing datasets (Webb et al. 2017). A more collaborative approach to NGOs by government could improve revenue outcomes and better support sustainable forestry management.
129. **Community engagement, frequently discussed in the context of decision making or of the Paris Agreement (which emphasizes the need for stakeholder engagement in climate change efforts), also needs to figure into revenue management.** Involving communities in monitoring forest governance can itself be a mechanism to improve transparency, per Barletti et al. (2018), who compare three specific tools for this purpose. Improving information availability can also help, if the information is easily accessible, stakeholders have opportunities to engage, and civic space is sufficient. In Ghana, biannual reports have been published showing the amount of forest funds paid to subnational entities. Despite some delays and incomplete dissemination, government officials have said that the reports helped communities to put pressure on the district assemblies and traditional authorities that received the funds to account for their use. The publication of this information is highly unusual in the region and represents a significant achievement (World Bank 2014c).

130. **One model for stakeholder engagement comes from work that has been done on dispute resolution.** For example, the World Bank has worked to help countries strengthen national feedback and grievance redress mechanisms for forestry, in particular through the Forest Carbon Partnership Facility and its support to countries for institutional arrangements to facilitate REDD+ readiness. The idea is to enable stakeholders to lodge grievances either during the REDD+ readiness or operational phase around issues such as benefit sharing, resource and tenure rights, and implementation of territorial planning.<sup>24</sup> These kinds of mechanisms could also incorporate consideration of revenue-related issues.
131. **Similarly, the private sector must be engaged in efforts to strengthen revenue management and sustainable forestry.** As a basis for constructive engagement, there is a need for an internationally agreed standard for the release of logging concessions data. This would improve both the availability of concessions information, improving accountability and collection processes, but also the quality of published information (Webb et al. 2017). In general, working more effectively with the private sector is a frontier area for the broader open government movement, which seeks to make governments more responsive to constituents' priorities through dialogue and meaningful engagement.
132. **Certification and citizen education present opportunities for improved revenue management in forestry.** The international community has an essential role to play in practicing responsible governance (Brown et al. 2002). As a result, the potential to increase the value of forestry products may grow, along with improved transparency and accountability for forestry and revenue management. Certification programs exist in many sectors, with forestry leading the way, and cover a number of policy dimensions such as labor, environment and safety. The existence of these sometimes overlapping certifications reveals gaps in government policies. Applying a recognizable standard for sustainably logged, accountable and transparent forestry allows consumers to make choices based on their preferences and reliable information. However, while a single standard is more easily understood by consumers, multiple standards provide producers at varying levels of size and capacity with attainable thresholds that give them incentives to continuously improve.<sup>25</sup> There are revenue implications from certification, including greater price differentiation for products meeting the highest standards. Certification can also serve as a basis for differentiating forestry tax rates according to methods of production (World Bank 2019a). This presents an area of potential further work for the international community working in forestry and governance.
133. **International agreements and policies in consumer countries can provide incentives for transparency and due diligence.** Legislation such as the EU Timber Regulation, US Lacey Act, and Australian Illegal Logging Prohibition Bill put the onus on importers and traders in the consumer countries to undertake due diligence to ensure that the timber they are trading comes from legal sources. Legality would imply that all local laws (and hence any fees due) have been respected in the country of origin. International certification schemes have adapted so that they can help provide the necessary documentation to demonstrate compliance with producer country legislation. When introducing the Timber Regulation, the EU also provided support through voluntary partnership agreements with a number of producer countries to set up systems that

<sup>24</sup> See <https://www.forestcarbonpartnership.org/grievance-redress>.

<sup>25</sup> See World Bank (2019a) for a full discussion of the environmental utility of multiple certification standards.



could ensure that timber was being produced legally. To the best of our knowledge there has not been a rigorous evaluation of whether these initiatives have had an impact on revenue collection, specifically, in the producer nations.

134. **For too long, forestry policy and revenue administration have often been conceived and implemented in a “silo,” detached from many of their most important constituents and without adequate recognition of the strong linkages between forestry, other land use sectors, and broader social and environmental priorities.** As the international consensus has shifted to recognize the importance of a “whole of government,” landscape-based approach to manage forests (in the context of global environmental commitments), institutional arrangements must similarly evolve to reflect this. A pivot toward greater openness and stakeholder engagement, facilitated by adequate human and financial resources and underpinned by sound revenue administration procedures, is essential to revenue management and can help governments to ensure that healthy forests will survive to support generations to come.

## CHAPTER 5: CONCLUSION

135. **In many countries, forestry governance has been failing for decades, with devastating results.** Despite measurable improvements in certain parts of the world and specific aspects of forestry, well-intended efforts to (among other objectives) strengthen accountability, increase revenue collection and tackle corruption have had limited success at best in reversing the fortunes of the sector overall. New approaches and ways of working are urgently needed. Forest ecosystems are rapidly disintegrating with consequences for local communities, government revenues, and most dramatically, the climate and biodiversity crises. This paper has sought to bring together different perspectives on sustainable forestry and revenue management, to suggest new ways of addressing persistent failures in forestry governance and domestic resource mobilization.
136. **While revenue management reform cannot singlehandedly bring about sustainable forestry management, it is clear that improved forestry planning and revenue management have the potential to both mobilize domestic revenues and improve governance in the forestry sector, two tasks that have evaded many developing countries for too long.** Sound revenue management contributes both to domestic resource mobilization and sustainable forestry management by providing mechanisms for all stakeholders to engage in a system with common rules and transparent processes for accountability, while aiming to keep compliance costs to a minimum. It holds the means to contribute to sustainability by enabling more transparent reporting, improving the quality of data that is essential to planning and decision making on the optimal use of land, and mobilizing revenues to better resource forestry management.
137. **This paper identifies various opportunities to strengthen revenue management, including improving forestry revenue planning, strengthening operational systems and processes, and reforming institutions.** A number of practical steps have been discussed to strengthen existing practices, such as establishing an up-to-date single forest user database, improving revenue projections, automating billing and payment systems, and strengthening controls and compliance, including through systematic auditing. The paper has not sought to outline a definitive revenue management system, mindful of the diversity in forestry administrations around the world,

but has sought to provide guidance on elements of practical revenue practices that could be adapted to local needs and contexts.

138. **Given the essential precondition that the country’s chosen fiscal instruments create “forest-smart” incentives<sup>26</sup>, sound revenue management has the potential to discourage inappropriate land use—something forestry experts, environmentalists and economists have long sought.** More accurately accounting for projected and actual revenue, and better enforcing revenue management controls, has the potential to better inform decision makers on the true costs and benefits of land use, and where revenue is collected, generate the resources needed to better manage forests into the future.
139. **The lack of recent, systematic evaluations of forestry revenue administration practices at the country level are a significant limitation on the analysis and recommendations presented here.** Nevertheless, there are clear lessons for developing countries—namely the need to better align forestry planning with revenue management, the importance of inter-agency coordination, and the immediate need for greater oversight and openness to public accountability mechanisms. Examples of where such reforms have worked are ample across other extractive industries and the forestry sector in developed countries, and the priority now is to share those lessons and support developing countries in adopting measures to strengthen their forestry revenue management systems. Country-level studies of revenue administration challenges and reforms would help to enrich the discussion and point the way for future work. Further research could also examine whether policies in consumer countries, such as the EU Timber Regulation, US Lacey Act, and Australian Illegal Logging Prohibition Bill, have had any effect on revenue collection in producer countries.
140. **There is a clear opportunity for development assistance to provide greater technical expertise and other support in pursuit of improved governance, sustainable forestry and revenue management.** The many years of expertise acquired improving the governance and accountability of other extractive industries must now be applied to a perhaps even more valuable resource, our forests. A key takeaway for donors is the need for more systematic, technically exacting support for key forestry institutions and stakeholders, if revenue systems are going to improve and deliver for developing countries.
141. **The World Bank’s Sustainable Development and Equitable Growth, Finance and Institutions Vice Presidencies are working in partnership to identify opportunities to bring their combined skills to developing countries seeking support for sustainable forestry.** There is also scope to collaborate with other donors and organizations active in forestry, such as CIFOR, DFID, FAO, and GIZ, among others, in supporting sound forestry revenue management. This approach is consistent with the World Bank’s commitment in the 2016 Forest Action Plan to ramp up its assistance to forest institutions by broadening their interventions from primarily policing functions to a more comprehensive range of public service provider functions, including strengthening revenue management in the forestry sector.

---

<sup>26</sup> In the 2016 World Bank *Forest Action Plan*, the Bank committed to “forest-smart” policies. For improved revenue management to yield environmental and social benefits, underlying fiscal policies must be structured to incentivize good outcomes (e.g. by varying tax and royalty rates according to land use and production methods, per World Bank (2019a)); otherwise, strengthening their enforcement can worsen the existing problems.

142. **Opportunities to support revenue management reform, and potential implications for the work of the World Bank and other donors together with partner governments, include:**
- Undertaking a diagnostic of revenue management and institutional processes in the forestry sector by applying a new diagnostic questionnaire and/or the World Bank DIAMOND Diagnostic Tool (see Annex 2);
  - Technical assistance for the establishment of a comprehensive database that tracks the location, scale and ownership of forestry user agreements;
  - Revenue forecasting training delivered jointly to forestry and revenue authorities;
  - Support for the introduction of automated electronic billing, payment and payer management systems;
  - Technical assistance and capacity building around the audit function in the forestry sector; and
  - Undertaking an institutional review of roles and responsibilities in forestry, and promoting open data and stakeholder engagement initiatives, with a view to improving revenue mobilization and sustainable forestry management.
143. **Incorporating practices of sound revenue administration throughout forestry sector management—taking a “whole of forestry” approach—can have positive effects on outcomes for the sector as a whole.** Sound revenue collection and administration can help to increase the resource envelope for forestry and other government priorities by ensuring the revenues owed on public assets are collected, although potential forestry revenues are modest as a share of GDP in all but a few heavily forested countries. Beyond resource mobilization, improving revenue administration has the potential to improve transparency, accountability, equity, and resource management, contributing to the good governance of a valued natural resource.
144. **A good revenue system is an integral part of a well-managed sector overall.** Revenue management cannot be simply “attached” to a forestry administration that does not follow sound silvicultural practices or does not systematically perform robust planning, decision-making, and monitoring functions. It is neither a panacea for the ills of the sector (see the other papers in this series, along with World Bank 2019a, for additional thematic discussions of potential reforms), nor a function that will take care of itself if only a certain technology or process is put in place. Rather, revenue administration needs to fit logically into each step of forestry operations, both in terms of long-term planning and daily management.
145. **The call for better revenue administration in forestry may come across as overly technocratic and narrow, given the urgency of the problems of forests.** Strengthening revenue administration is rarely an appealing political proposition or front and center in public policy debates. Alone, it will not solve the pressing climate challenge or destruction and degradation of remaining forests.
146. **However, the state of the world’s forests requires that governments and their partners explore every avenue that offers the potential to improve governance and sustainability.** Steps to improve visibility into the use of forests and to redress failures in valuing essential resources properly need to be taken. Revenue management presents an entry point for reform, collaboration, and technical support that has been under-utilized, but is essential to addressing

what is now the critical state of forests. Strengthening revenue management will depend upon the active participation not only of forestry and finance ministries, but of the entire range of stakeholders involved in the sector, from NGOs, community organizations and the media, to private sector entities, to other government actors including parliaments and other bodies (e.g. subnational governments, anti-corruption entities, and other relevant line ministries). It will require a collaborative effort to grapple with revenue management as one of many challenges to achieve better outcomes for forests and those who depend on them.

## ANNEX 1: FORESTRY REVENUE MECHANISMS

This annex contains a non-comprehensive list of forestry revenue mechanisms for reference. It is adapted and simplified from the Appendix in Gray (2002, 91-100), augmented with recent research on the effects of different fiscal instruments from World Bank (2019a) where indicated. Most jurisdictions use a combination of different royalties, taxes, and other charges for different purposes (for example, royalties such as stumpage fees are used to recoup the value of the publicly-owned resource; taxes are levied in the forestry sector for the same reason they are in others; fees and charges may be used to cover administrative costs). Some methods are more distorting than others in terms of social/environmental as well as economic incentives and should therefore be evaluated carefully, especially because their impacts are heavily context-dependent. The same instrument may have a positive effect on sustainability in one situation and a negative effect in another, depending on the other factors at work. Quality of implementation and supervision is also key.

<b>Revenue Mechanism</b>	<b>Description</b>	<b>Effect</b> (indicative only; for detailed analysis, consult references)	<b>Other Selected Notes</b>
<b><i>Charges on timber harvested</i></b>			
Volume-based stumpage fees	Fee per unit of timber harvested (e.g. per cubic meter). The most widely used revenue mechanism in both developing and developed countries. Per-tree charges also exist.	Encourages selective harvesting (can incentivize high-grading, or “creaming”—the removal of the most valuable specimens—if other controls are not in place). In contrast to recurrent area-based fees (see below), may have the effect of lengthening the harvest cycle (World Bank 2019a).	Difficult to administer due to difficulty of setting price and verifying volume. Requires strong field capacity.
Charges based on area logged	Based on area to be logged. Paid prior to harvest.	Encourages more intensive harvesting per hectare.	Key advantage is administrative simplicity, but in natural forests cannot properly reflect the value of the timber.
Lump-sum timber sales	Sale of all timber, or all marked timber, on a cutting area as a block.	Encourages full use of the area and marked timber.	Can work well in conjunction with competitive bidding.
Competitive bonus bidding	Sale of timber by oral auction or sealed tender.	Where competition is strong, can adequately reflect the value of the timber.	Requires competitive conditions.

Specific charges for certain products	Charges on non-timber forest products (e.g. nuts, medicinal plants), specific charges on processed products (e.g. plywood, pulp), and other miscellaneous charges.	Charges on non-timber forest products can serve as a signal that all forest products have value, and as a basis for future control. Charges on processed products discourage efficient use of timber.	Administration of charges on non-timber products is difficult. Charges on processed products in lieu of stumpage charges are not recommended.
Export taxes	High rates of export taxes on logs or processed products are used to raise revenues, to discourage the exports of logs or processed products, or to encourage further processing.	Can generate significant distortions in using and marketing forest products. Can encourage waste and inefficiency in domestic industry.	In practical terms, charging at the export “choke point” may be the most administratively feasible option for timber taxation (World Bank 2019a).
<b>Charges on forest operations</b>			
Charges, fees, and taxes on capital equipment, labor, or other inputs	Can include charges such as sawmill licenses, special charges on logging trucks and tractors, licenses for chainsaws.	Can be a mechanism to help control illegal logging.	Used primarily as tools to control equipment (e.g. to monitor and control the use of chainsaws).
Corporate income tax	Ordinary corporate income (net profits) tax on the profits of all corporations.	Can encourage corporations to understate profits (transfer pricing problems and other base erosion and profit shifting schemes). There are ways to design general taxation to increase incentives for sustainable practices (World Bank 2019a).	Require accurate accounting by corporations and reliable auditing. Not a substitute for stumpage prices or forest fees.
Profits tax and profit-based royalties	Special logging profits taxes levied in addition to ordinary corporate income tax. Alternatively there are resource rent-based taxes that attempt to measure and tax the value of the natural resource itself.	Can encourage corporations to understate profits (transfer pricing problems and other base erosion and profit shifting schemes).	Profits tax could be considered as a replacement for stumpage prices or other forest charges, but is limited to only a set percentage of the value of the timber. Resource rent-based tax applicable only to large, integrated forest development projects.
Government ownership or participation in the forest industry	Government ownership or participation (joint ventures or shareholding) in the forest industry are sometimes suggested as substitutes for forest charges.	Government forest firms and joint ventures should still pay forest fees; otherwise, they will be receiving “free wood,” distorting their decisions and wasting resources.	An indirect and not very effective way to capture timber values.

<b>Charges for forest lands and tenure, and for non-timber outputs</b>			
License and renewal fees	A fixed fee or per-hectare fee, generally intended to cover administrative costs.	If set high enough, initial fees will discourage frivolous or speculative concession application and acquisition or renewal.	Fees should be high enough to cover administration costs of granting and renewing concessions.
Competitive bonus bids on forest concessions	Common for other natural resources. Can take the form of initial or annual bonus or premium payment.	Can provide a measure of the value of concessions and of timber values for use in setting fees on other parameters.	Useful if competition for forest concessions exists or can be encouraged.
Various area-based fees, e.g. annual ground rentals on forest concessions; property taxes on concessions; area-based service fees	Annual ground rental is usually based on total area of the concession; in some countries, the area of productive forest or the annual allowable cut. Other assorted charges also possible.	Annual ground rentals can discourage concessionaires from holding on to large tracts of land for speculation. Area-based service fees can facilitate cost recovery and efficiency in providing forestry services. However, increasing the fixed costs of commercial forestry has a variety of other potential impacts, such as increasing the size of the informal sector, shortening the harvest rotation period, or creating incentives to convert forested land to other uses (World Bank 2019a).	Opportunity for more widespread use of area-based fees as key components of forest revenue systems, since administration is relatively easy, but risks must be carefully considered.
<b>Feebates (see World Bank 2019a)</b>			
Taxation-rebate (or 'feebate')	A default tax rate is charged based on the assumption of worst-case sustainability practices and rebates are offered to accredited producers who practice sustainable production and forest management. Rather than merely taxing output, a feebate scheme varies tax rates according to production method.	Predicted to promote sustainable forest management and reduce the size of the informal sector. Would be applied most effectively to export taxes (for administrative feasibility).	Little empirical evidence on effect, as major reforms of this kind have not been attempted.

Source: Adapted and simplified from Gray (2002) with additions where noted from World Bank (2019a).

## ANNEX 2: FORESTRY REVENUE MANAGEMENT QUESTIONNAIRE

The following draft questionnaire is intended to assist government officials and other stakeholders in evaluating the current state of a national forest revenue management system. It aims to systematically consider a country's planning, operational, and institutional aspects of revenue management as discussed in the paper, and also includes a data collection form on key revenue-related information. The diagnostic enables users to begin identifying priority areas for investment or reform. It is intended to reveal opportunities to strengthen revenue management systems and processes and help to develop a reform plan through incremental steps.

The questionnaire is subject to further development and piloting, with potential for more detailed and additional questions to be added. The questionnaire is not intended to evoke purely binary yes or no answers, but rather to guide discussion and identify opportunities to improve effectiveness and efficiency of the system. The indicators will allow administrations to capture progress and identify success and failure when piloting. The tool can be used on its own or in conjunction with the much more exhaustive World Bank DIAMOND tax administration diagnostic tool, described in the second half of this annex. Any pilot or reform program should incorporate a monitoring and evaluation plan that would identify contextually appropriate indicators of progress and a means to collect and act on them.

### FORESTRY REVENUE MANAGEMENT QUESTIONNAIRE

#### Forestry Revenue Planning Indicators

**For each indicator: To what extent does the statement describe current practices and systems?**

Indicator ID	Name
<b>Strategic Planning</b>	
GP020	The Forestry Authority has strategic planning instruments in place
GP021	The strategic plan is published, and contains objectives and performance indicators
	The strategic plan considers revenue management, including long term revenue projections, assessment of viability of commercial forestry or preservation based on revenue analysis
	The strategic plan is consistent with the national forest inventory
	The strategic plan is consistent with the government's vision for land use
	Concessionaire contracts are consistent with strategic plan
	Technologies are adopted to improve collection of forest information
	Plans support the prediction of an Annual Allowable Cut (AAC)
	Plans reflect consultations with government agencies, forest-users and civil society
<b>Tactical Planning</b>	
	Forestry Authority has a detailed development program, covering a five to ten year horizon
	Forest management plans articulate how areas will be managed in the medium term
	Forestry estimates are included in the government's Medium-Term Expenditure Framework



	AAC estimates refined based on more detailed information
	Recurrent expenditure and investment plans (including for Forestry Transformation and ICT) are articulated
<b>Operational Planning</b>	
GP022	Operational business plans (annual) are published and contain performance indicators
	Annual plans include detailed budgets with revenue estimates and detailed expenditure plans
	Annual budget includes forestry revenue estimates; planned cash flow; payment schedule and anticipated amounts in billing system

### Operational Indicators

**For each indicator: To what extent does the statement describe current practices and systems?**

Indicator ID	Name
<b>Forest-User Database (Registry)</b>	
	All concessions and other forest-user contracts are compiled in a single registry that is quality assured for accuracy and currency
	The database contains information related to the company name, registration, beneficial ownership, land area, location, user rights and concessions
	Responsibility for managing the registry is with the concession-issuing authority, typically the central Forestry Authority
GP092	The forest-user registry system is fully automated and accessible to taxpayers online
GP095	Concessionaires and other forest-users have the obligation to inform the Forest Authority of any change or modification in registry data
<b>Revenue projections</b>	
	The Forestry Authority produces revenue projections for forestry revenue, using “top-down” analysis (aggregate performance of the sector) and “bottom-up” approaches (utilizing detailed company-level operational forecasts)
	Forestry revenue is projected over the short (annual), medium (3-year estimates) and longer-term (ten-year projections)
	Revenue projections are discussed with the Finance Ministry and a consensus reached for incorporation into budget forecasts
	Concessionaires and forest-users are consulted in the preparation of forestry revenue projections to improve accuracy
	Forestry revenue projections are incorporated into forestry planning and management processes
GP017	The forestry authority reviews revenue forecasting methodologies periodically
<b>Billing System</b>	
	The Forest Authority has an automated billing system
GP094	The Forest Authority carries out checks to detect non-filers or delinquent taxpayers via an automated information system, and sends formal notices
	Forest fees are specified in published schedules

	Where billing relies on self-assessment, Forestry Authority conducts quality assurance
<b>Payment Systems</b>	
	There is a single payment procedure for concessionaires and forest-users
	Information on the payment procedure is clearly set out and available to concessionaires and forest-users
	Payments are made electronically
	The payment and billing systems are reconciled to ensure the full payment is received
<b>Payer Reporting</b>	
	All concession holders and forest users are required to report their payment obligations, as well as royalties and fees paid, at prescribed times
	A single authority sets the reporting standards at the national level
<b>Data Management</b>	
	Processing of forestry revenue is centralized through a financial information system or integrated forestry management system
GP055	The Forestry Authority measures processing times for core revenue management processes
GP056	There is an IT architecture to create suitable, user-friendly and manageable solutions
GP057	There is an Information and Technology Master Plan in place
	Training on data management is provided to all staff involved in revenue management, including in local forestry offices
<b>Control and Compliance</b>	
GP110 & 111	The Forestry Authority has a team responsible for assisting concessionaires and forest-users to comply with their tax obligations and control delinquent concessionaires
GP128	The Forestry Authority has adequate powers to enforce collection of revenue arrears
GP130	The Forestry Authority has an automated information system for managing tax arrears
GP131	The staff in the tax arrears function are qualified to carry out their functions
GP132	Tax arrears are classified by age, size and level of complexity in order to identify probability of collection and define the scope and nature of collection enforcement actions
GP134	The Forestry Authority stipulates a well-balanced sanction regime in case forest-users/ concessionaires do not comply with their tax obligations
GP135	The Forestry Authority applies interest and sanctions to tax arrears as defined by tax laws, regulations and contracts
GP136	The Forestry Authority has the power to grant installment plans to forest-users
<b>Revenue sharing and Distribution</b>	
	Detailed revenue information (type and source) is available to calculate accurate payments where revenue is distributed (e.g. to local government etc.)
	Direct transfer arrangements are in place based on a schedule and with clear reporting

<b>Audit</b>	
GP114	There is an audit unit with the responsibility for designing the strategy, procedures, and work plans, as well as monitoring and following up on audit work performed at the operational level
GP115	The revenue audit strategy is based on a comprehensive compliance risk management model
GP116	The Forestry Authority has an automated information system for ensuring adequate management of revenue audits
GP117	The Forestry Authority has an automated information system for analyzing tax evasion and avoidance
GP118	The staff in the revenue audit function are qualified to carry out their functions
GP121	Results obtained in implementing the annual audit work plan are regularly and routinely analyzed to inform and update the audit strategy and criteria used in the risk analysis model
GP125	The Forestry Authority coordinates and cooperates with other financial crime investigation departments (e.g., financial police or anti-money laundering units) for investigating tax fraud cases
GP126	There are coordination mechanisms in place between the revenue audit and the revenue arrears management areas in order to ensure timely and effective enforcement collection action
GP127	The Forestry Authority monitors the quality of tax audits through the use of internal and/or external controls
	Common errors identified in forestry revenue audits are regularly communicated to concessionaires and forest-users to improve practices
<b>Dispute Resolution</b>	
	Forestry contracts include a clause stating the mechanism(s) for resolving disputes
GP109	The Forestry Authority has an automated information system to follow up on concessionaire and forestry-user complaints
GP137	The Forestry Authority has a specialized team to deal with administrative tax appeals
GP139	The staff in legal affairs are qualified to carry out their functions
GP140	There is an independent and free-of-charge administrative institution that deals with tax appeals prior to submitting the appeal to the Courts
GP144	The relevant legislation allows the Forestry Authority to issue binding rulings for specific forestry revenue related cases or subjects
GP145	Concessionaires must provide some type of guarantee/collateral when submitting/filing a tax appeal to suspend collection enforcement procedures

### **Institutional Indicators**

**For each indicator: To what extent does the statement describe current practices and systems?**

<b>Indicator ID</b>	<b>Name</b>
<b>Roles and Responsibilities</b>	
	The Forestry Authority has a clear functional structure with a specialist revenue administration team
GP035	The Forestry Authority has an Organization and Functions Manual
	Revenue administration functions are clearly allocated between the central Finance Ministry and Forestry Authority, with responsibilities set out in law and regulations

GP027	Forestry revenue management is decentralized, where the skills to administer revenue exist at the local level
	The Forestry Minister is a member of Cabinet or a Senior Portfolio Minister
<b>Forestry revenue team</b>	
	Revenue administration functions are separate from physical forestry administration functions
GP070	The Forestry Authority aims at limiting contact and interaction between revenue administrators and forest-users
GP023	The Forestry Authority revenue management team regularly maps its revenue administration processes
GP025	The Forestry Revenue Management Team has a system for managing information
<b>Whole of Government coordination (Forestry and Finance Ministry coordination)</b>	
	The Forestry Authority coordinates with the tax administration on forestry revenue policy and administration
	Technical expertise on forestry and revenue management are shared between the Forestry Authority and Finance Ministry respectively, including staff secondments
	Financial Management Information Systems are integrated or shared between the Forestry Authority and Finance Ministry
	Joint policy and revenue dialogues are regularly held between the Forestry Authority and Finance Ministry and with forestry stakeholders
	A taskforce or Inter-Departmental Committee is permanently established between the Forestry Authority and Finance Ministry
	Open data and exchange of information is in place between the Forestry Authority and Finance Ministry
<b>Resourcing and capacity</b>	
	The Forestry Authority has sufficient resourcing to achieve its objectives
GP036	The Forestry Authority has developed and published a Human Resource Management Strategy
GP044	There is a staff induction process for new employees entering the Forestry Authority
GP045	The Forestry Authority has an automated information system for human resources management
GP040	Continuous professional development to staff in the revenue management areas
GP041	Continuous professional development from authorized external institutions
GP037	Implementation of policies, systems and procedures for staff
<b>Institutional Change (Transforming Forestry and ending corruption)</b>	
GP077 & 81	Forestry Authority has an independent internal control unit that receives and investigates complaints
GP078	There is a Code of Ethics in the tax administration
	An enforcement regime is in place that imposes significant, timely, and evident penalties for behavior that breaches the Code of Ethics
GP079	Strategy for the prevention of corruption

GP038	Forestry Authority has a salary and incentives policy
GP039	Forestry Authority has a long-term training strategy
GP042	Performance evaluation and management system for the staff
GP043	Internal surveys are conducted periodically
GP046	There is an internal communication plan/program(s)
GP108	Forestry Authority has adopted a client service culture, which feeds into the design and provision of quality service standards to forest users, community groups and stakeholders
GP063	Forestry Authority has a merit-based recruitment system
	Forestry Authority has an operational plan for upgrading information technology systems
<b>Transparency and Stakeholder engagement</b>	
GP047	Forestry Authority prepares and publishes annual reports
GP048	Forestry Authority has a public dissemination program that provides information about its performance and activities
GP049	Forestry Authority is committed to achieving pre-established standards in providing services to forest-users
GP050	Regular consultations with forest-users and civil society to assess and improve revenue administration performance
GP051	Regular consultations with forest-users to address problems of corruption and make proposals to reduce their incidence
GP052	Results are published from forest-user perception surveys
GP053	Results are published from forest-user satisfaction surveys
GP066	Forestry Authority's website and portals are fully operational
GP107	Forestry Authority collaborates with non-governmental organizations and academia to improve transparency
	Complies with the Extractive Industries Transparency Initiative in Forestry

### Context Data Collection Form

**This form is designed to capture relevant data to support the diagnostic.**

<b>REVENUE MANAGEMENT (OPERATIONS)*</b>			
<b>Forestry revenue collected (in millions of ...)</b>			
	<b>FYear-3/ FYear-2</b>	<b>FYear-2/ FYear-1</b>	<b>FYear-1/ FYear</b>
Total forestry revenue forecasted			
Total forestry revenue collected			
NET forestry revenue collected**			
Total amount of forestry revenue paid electronically			

<b>Revenue collected by Forestry Authority by tax type (in millions of ...)</b>
---

	FYear-3/ FYear-2	FYear-2/ FYear-1	FYear-1/ FYear
NET stumpage fees**			
Forestry licenses and renewal fees			
Forestry royalties			
Forestry export taxes (if collected by Forestry Authority)			
Charges on forestry-related capital equipment, labor and other inputs			
Other forestry revenues			
<b>Forestry-User Registry</b>			
	FYear-3/ FYear-2	FYear-2/ FYear-1	FYear-1/ FYear
Total number of registered forestry taxpayers			
Total number of active forestry taxpayers			
Number of Forestry Concessionaires			
Number of Community-based forest users			
Number of Other Forestry Taxpayers			
Number of active Corporate forestry taxpayers			

<b>Forestry Refunds Management</b>			
	FYear-3/ FYear-2	FYear-2/ FYear-1	FYear-1/ FYear
Number of accumulated pending tax refund cases as of December 31			
Accumulated amount of pending tax refunds as of December 31			

\* all local currency (in millions) unless otherwise specified; in millions

\*\*Net = Gross minus refunds

<b>ADMINISTRATION</b>			
	FYear-3/ FYear-2	FYear-2/ FYear-1	FYear-1/ FYear
Total Budget of Forestry Authority			
Actual Budget Execution of Forestry Authority			
Budget assigned to IT			
Budget assigned to Revenue Management (Operations)			
Budget assigned to Tax Audit			
Budget assigned to Taxpayer Information and Assistance			
Budget assigned to Legal			
Budget assigned to Internal Audit			
Budget assigned to Enforcement			

<b>HUMAN RESOURCE MANAGEMENT</b>			
	FYear-3/ FYear-2	FYear-2/ FYear-1	FYear-1/ FYear
Total number of personnel			
Total number of training courses			
Number of employees in attendance at above training courses			
Number of personnel in IT			

Number of personnel in Revenue Management (Operations)			
Number of personnel in Tax Audit			
Number of personnel in Legal			
Number of personnel in Internal Audit			
Number of personnel in Enforcement			
Number of professional staff in IT			
Number of professional staff in Revenue Management (Operations)			
Number of professional staff in Tax Audit			
Number of professional staff in Legal			
Number of professional staff in Internal Audit			
Number of professional staff in Enforcement			
Number of non-filled positions of professional staff grade in IT			
Number of non-filled positions of professional staff grade in Revenue Management (Operations)			
Number of non-filled positions of professional staff grade in Tax Audit			
Number of non-filled positions of professional staff grade staff in Legal			
Number of non-filled positions of professional staff grade in Internal Audit			
Number of non-filled positions of professional staff grade in Enforcement			

## OVERVIEW OF THE DIAMOND DIAGNOSTIC TOOL

**DIAMOND ([www.taxdiamond.org](http://www.taxdiamond.org)) is a World Bank model** that draws on outcomes of initial diagnostics of revenue administration and designs technical assistance programs for revenue administration reform. DIAMOND provides a set of operational tools to determine a country's tax and customs administrations in terms of strengths and weaknesses, do an in-depth assessment of performance gaps, and make recommendations for improvement in each area. DIAMOND complements existing high-level analytical tools, such as the Tax Administration Diagnostic Assessment Tool (TADAT).

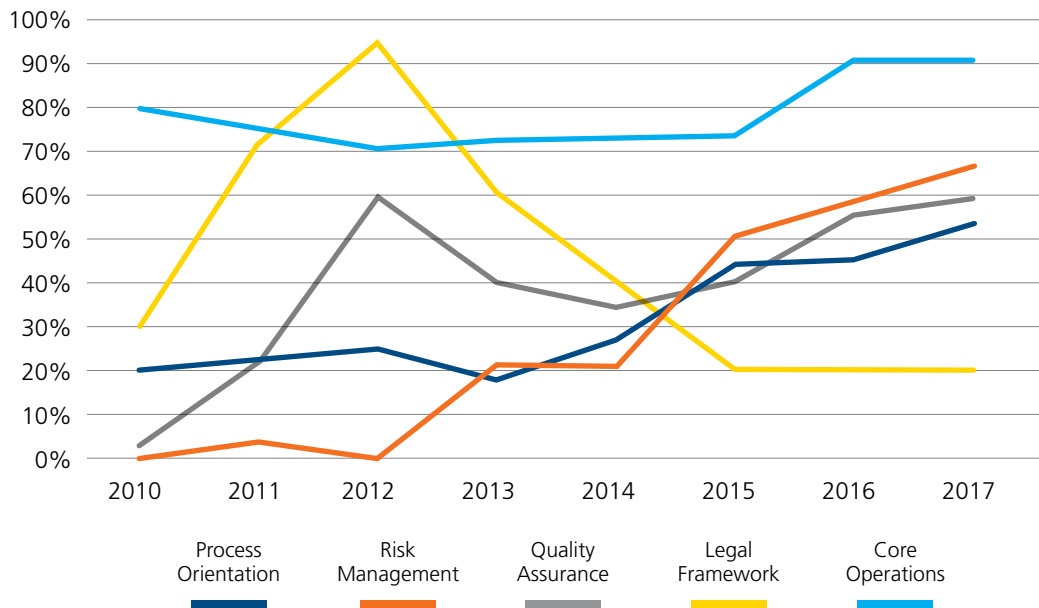
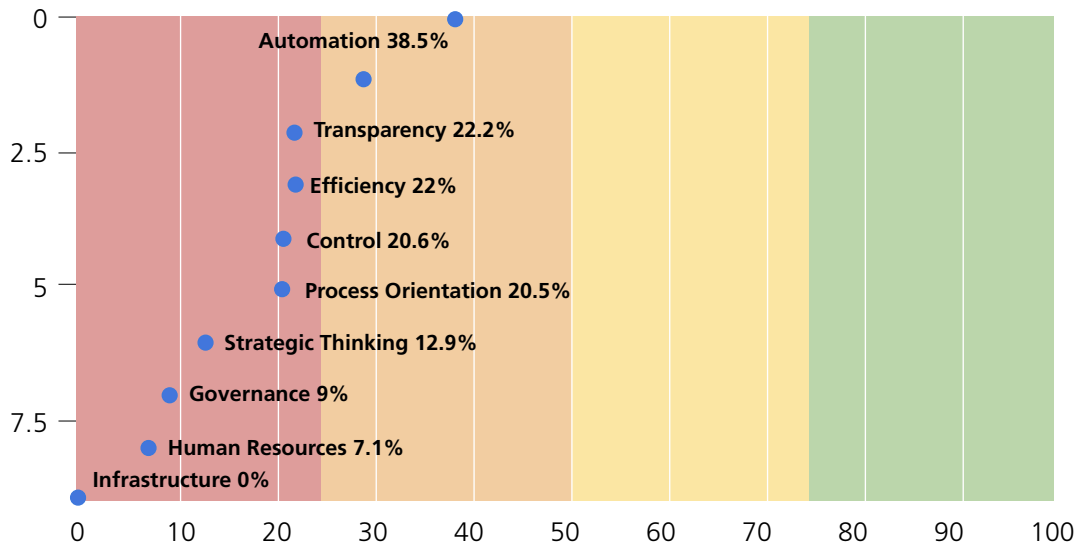
DIAMOND produces objective assessments by encoding international good practices in a variety of areas in a series of indicators; documenting how the organization measures up to these good practices in their actual operation; validating these indicators with the corresponding evidence; and organizing these measurements in a way that quickly and intuitively highlights core limitations.

Through its systemic approach, DIAMOND allows revenue administrations to identify areas for successful reform where it had previously remained elusive. The model systematizes expertise and relies on evidence, which it uses in a transparent manner. In these respects, it deviates from traditional technical assistance, which has tended to be driven by individual experts' assessments and, in some cases, a "black box" approach to evidence.

DIAMOND is deployed based on a country's demands and desired timeline. The model provides tools that countries can apply and use themselves. DIAMOND is modular, with the choice of which modules to apply depending on country needs and demand.

The Global Tax Team of the World Bank has applied each of the core modules<sup>27</sup> with five revenue administrations in various parts of the world. As part of this report and in cooperation with the World Bank’s Sustainable Development practice, it is proposed that a **sectoral module on Forestry Revenue Management** be developed for incorporation into the DIAMOND tool.

The DIAMOND tool generates reports that allow the World Bank and its partners to collaborate on designing action plans supported by international good practices and oriented to solving core limitations. The results can also be tracked over time. Sample graphical outputs from the tool are shown below.



<sup>27</sup> Functional review of tax administration; customs diagnostic; process mapping and business process reengineering; ICT assessment and functional review of IT systems; and HR assessment. Countries where this framework has been applied are so far Afghanistan, Bangladesh, Colombia, Pakistan, and Uganda.



## ANNEX 3: SOURCES ON CONTROL OF INDUSTRIAL FOREST CONCESSIONS

### Introduction

The sources assembled here provide some select examples for those involved in establishing, administering, enforcing and resolving conflicts related to contracts concerning industrial forests. This includes contracts that are often termed “industrial forest concessions”, but also, because the issues involved are often similar, has relevance to contracts addressing timber sales, nonindustrial activities, mineral and gas exploitation and many other matters. Most critically, these involve agreements conveying valuable rights to benefit from forest resources in exchange for conduct or delivery of services or payments (or both), usually within set time periods, to a level of professional or technical proficiency, and in ways that do not damage the natural integrity of the concerned forest. In this sense, the “concession”, or “license”, or whatever other privilege that these contracts convey is therefore an instrument for forest management and these sources are intended to support those involved in the pursuit of socially profitable and environmentally sustainable outcomes.

The sources here are not, primarily, intended to address sustainable forest management, on which topic resources are amply available elsewhere. Above all, these sources do not offer universal or comprehensive guidance, but are rather a sampling of practical resources that may be useful in varying contexts. Most often problems in concession systems will be encountered after they have been put in place. In practice then, much of the material related to system design and establishment will actually be encountered by users as problems of implementation and reform. The possibilities and pathways open to reform may be more limited and difficult to accomplish, but will generally relate to the same issues and choices as those that are discussed as matters of design.

The infinite variability of forests and of the social settings within which forest utilization occurs prevents this. Examples can only help to support the exercise of sound and considered judgment by responsible authorities accountable to an informed public.

### The Foundations of Forest Utilization Contracts and Concessions

This section includes material that discusses the basic underlying logic of forest contracts, examples of the ways in which they may be structured, and some of the specific terms and obligations that may be contained.

Source	Item	Description
<b>Canadian government (British Columbia)</b>	Website	Examples of agreements for utilization of public forest resources
<a href="https://www2.gov.bc.ca/gov/content/industry/forestry/forest-tenures">https://www2.gov.bc.ca/gov/content/industry/forestry/forest-tenures</a>		
<b>Columbia Center on Sustainable Investment (CCSI) and International Senior Lawyers Project (ISLP)</b>	<i>Guide to Forestry Contracts—Understanding Key Provisions</i>	Guide to understanding the technical provisions and language typically found in forestry contracts
<a href="http://ccsi.columbia.edu/files/2016/10/GuidetoForestryContracts.pdf">http://ccsi.columbia.edu/files/2016/10/GuidetoForestryContracts.pdf</a>		
<b>Government of Cambodia</b>	The Royal Government of Cambodia Sub-Decree (Regulation) on Forest Management Concessions	
<a href="https://www.wto.org/english/thewto_e/acc_e/khm_e/WTACCKHM3A3_LEG_7.pdf">https://www.wto.org/english/thewto_e/acc_e/khm_e/WTACCKHM3A3_LEG_7.pdf</a>		

<b>Nicholas Miranda in the Yale Law Journal</b>	“Concession Agreements: From Private Contract to Public Policy”	2007 paper arguing that governments should conceive of concession agreements as matters of public policy rather than private contracts
<a href="https://www.yalelawjournal.org/pdf/622_2zirfaa4.pdf">https://www.yalelawjournal.org/pdf/622_2zirfaa4.pdf</a>		

### **Concession Award: Site Selection, Evaluation (Pricing) and Award, Negotiation**

Two essential steps underlie any attempt at establishing a sustainable forest concession. One is the selection of an appropriate site. The second is selection of suitable partners to ensure that only reputable, responsible, financially sound and technically capable enterprises are brought under serious consideration. This section includes material on options and issues involved in the establishment of specific concessions, including corporate social responsibility and due diligence to help evaluate potential concessionaires, approaches and alternatives for selection of specific concessionaires, and examples of concession and related agreements.

<b>Source</b>	<b>Item</b>	<b>Description</b>
<b>Confederation of Indian Industries/PwC (India)</b>	2013 Handbook on Corporate Social Responsibility in India	
<a href="https://www.pwc.in/assets/pdfs/publications/2013/handbook-on-corporate-social-responsibility-in-india.pdf">https://www.pwc.in/assets/pdfs/publications/2013/handbook-on-corporate-social-responsibility-in-india.pdf</a>		
<b>OECD</b>	OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas	Provides a framework for detailed due diligence as a basis for responsible global supply chain management of minerals and to help companies respect human rights and avoid contributing to conflict
<a href="http://www.oecd.org/daf/inv/mne/OECD-Due-Diligence-Guidance-Minerals-Edition3.pdf">http://www.oecd.org/daf/inv/mne/OECD-Due-Diligence-Guidance-Minerals-Edition3.pdf</a>		
<b>International Finance Corporation</b>	Corporate Governance Tools	Corporate Governance (CG) Methodology includes a set of tools to help examine elements of CG risk
<a href="https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+cg/investment+services/corporate+governance+tools">https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+cg/investment+services/corporate+governance+tools</a>		
<b>World Bank</b>	Use of evaluation criteria for procurement of Goods, Works, and Non-consulting Services using RFB and RFP (2016)	Reference on bid evaluation
<a href="http://pubdocs.worldbank.org/en/201591478724669006/Guidance-Evaluation-Criteria-FINAL.pdf">http://pubdocs.worldbank.org/en/201591478724669006/Guidance-Evaluation-Criteria-FINAL.pdf</a>		
<b>US Forest Service</b>	Timber Sale, Stewardship, and Forest Products Contracts and Permits	
<a href="https://www.fs.fed.us/forestmanagement/products/contracts.shtml">https://www.fs.fed.us/forestmanagement/products/contracts.shtml</a>		

<b>Canadian government (British Columbia)</b>		Extensive information on forest concession (Tree Farms), including contracts (licenses), management plans, maps, and other records and data
<a href="https://www2.gov.bc.ca/gov/content/industry/forestry/forest-tenures/timber-harvesting-rights/tfl">https://www2.gov.bc.ca/gov/content/industry/forestry/forest-tenures/timber-harvesting-rights/tfl</a>		
<b>US Bureau of Land Management</b>		
<a href="https://www.blm.gov/services/electronic-forms">https://www.blm.gov/services/electronic-forms</a>		
<b>US government (New Jersey)</b>	State of New Jersey Department of Environmental Protection Division of Parks and Forestry Concession Agreement-- Food/Novelty Concession	This represents an agreement that a vendor would enter into with the DEP, State Park Service, once they are awarded a concession.
<a href="https://www.state.nj.us/dep/parksandforests/parks/business_ops/docs/sample_concession_agreement.pdf">https://www.state.nj.us/dep/parksandforests/parks/business_ops/docs/sample_concession_agreement.pdf</a>		
<b>Canadian government (Alberta)</b>		
<a href="http://www.agric.gov.ab.ca/app21/forestry?page?cat1=Forest%20Management&amp;cat2=Forest%20Management%20Agreements&amp;cat3=FMA%20Holders">http://www.agric.gov.ab.ca/app21/forestry?page?cat1=Forest%20Management&amp;cat2=Forest%20Management%20Agreements&amp;cat3=FMA%20Holders</a>		

### Concession System Administration: Concession Cycle

This section includes material and examples related to the day-to-day administration of a concessions regime, including information relevant to understanding the role of public authorities in ensuring implementation of sustainable operations.

Source	Item	Description
<b>US Government</b>	<i>USFS Concessionaire Desk Guide</i> October 1997 (Campground Concession)	
<a href="https://www.fs.fed.us/specialuses/concession/index_guide.htm">https://www.fs.fed.us/specialuses/concession/index_guide.htm</a>		
<b>US Government (New Jersey)</b>	<i>Business Opportunities in New Jersey State Parks, Forests &amp; Wildlife Management Areas</i>	
<a href="https://www.state.nj.us/dep/parksandforests/parks/business_ops/index.htm">https://www.state.nj.us/dep/parksandforests/parks/business_ops/index.htm</a>		
<b>Canadian government (British Columbia)</b>	<i>Forest Tenure Administration</i>	
<a href="https://www2.gov.bc.ca/gov/content/industry/forestry/forest-tenures/forest-tenure-administration">https://www2.gov.bc.ca/gov/content/industry/forestry/forest-tenures/forest-tenure-administration</a>		
<b>Canadian government (Alberta)</b>	Ministry of Agriculture and Forestry website	Sample forms and templates including: Annual Operating Plan Submission; Daily Record of Timber Production; and others
<a href="http://www.agric.gov.ab.ca/app21/forestry?page?cat1=Forms">http://www.agric.gov.ab.ca/app21/forestry?page?cat1=Forms</a> <a href="http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/formain15788/\$file/Appendix2_Cutblock_Inspection_Form_v1.pdf?OpenElement">http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/formain15788/\$file/Appendix2_Cutblock_Inspection_Form_v1.pdf?OpenElement</a>		
<b>South African government</b>	Department of Agriculture, Forestry and Fisheries (DAFF) website	Sample applications for licenses

<a href="http://www.daff.gov.za/daffweb3/Branches/Forestry-Natural-Resources-Management/Forestry-Regulation-Over-sight/Licenses-and-Registration">http://www.daff.gov.za/daffweb3/Branches/Forestry-Natural-Resources-Management/Forestry-Regulation-Over-sight/Licenses-and-Registration</a>		
<b>FAO</b>	<i>FAO model code of forest harvesting practice (1996)</i>	Highlights the wide range of environmentally sound harvesting practices that are available to forest managers
<a href="http://www.fao.org/docrep/V6530E/V6530E00.htm">http://www.fao.org/docrep/V6530E/V6530E00.htm</a>		
<b>Victoria Department of Environment and Primary Industries</b>	<i>Code of Practice for Timber Production 2014</i>	To provide direction to timber harvesting managers, harvesting entities and operators to deliver sound environmental performance when planning for and conducting commercial timber harvesting operations
<a href="https://www.forestsandreserves.vic.gov.au/_data/assets/pdf_file/0016/29311/Code-of-Practice-for-Timber-Production-2014.pdf">https://www.forestsandreserves.vic.gov.au/_data/assets/pdf_file/0016/29311/Code-of-Practice-for-Timber-Production-2014.pdf</a>		
<b>Guyana Forestry Commission</b>	<i>Code of Practice for Forest Operations 3rd edition For Timber Sales Agreement and Wood cutting License Holders</i>	Code of Practice for Forest Operations provides a range of standards, guidelines and rules that will help concessionaires to adopt appropriate practices.
<a href="https://www.forestry.gov.gy/wp-content/uploads/2015/09/CoP-Timber-Sales-Agreement-and-Wood-cutting-Li-cense-Holders-3rd-v2-May-2013.pdf">https://www.forestry.gov.gy/wp-content/uploads/2015/09/CoP-Timber-Sales-Agreement-and-Wood-cutting-Li-cense-Holders-3rd-v2-May-2013.pdf</a>		
<b>ILO</b>	<i>Safety and health in forestry work: An ILO code of practice</i>	To protect workers from occupational safety and health hazards in forestry work and to prevent or reduce the incidence of illness or injury by providing practical guidelines
<a href="http://www.ilo.org/wcmsp5/groups/public/@ed_protect/@protrav/@safework/documents/normativeinstrument/wcms_107793.pdf">http://www.ilo.org/wcmsp5/groups/public/@ed_protect/@protrav/@safework/documents/normativeinstrument/wcms_107793.pdf</a>		
<b>Government of New Zealand</b>	<i>Environmental Code of Practice for Plantation Forestry</i>	Code aims to be a key reference tool to a wide range of parties involved in managing forests by providing information on environmental values, how such values should be assimilated into operational planning, other references and resources as well as the beps
<a href="https://www.nzfoa.org.nz/resources/file-libraries-resources/codes-of-practice/44-environmental-code-of-practice/file">https://www.nzfoa.org.nz/resources/file-libraries-resources/codes-of-practice/44-environmental-code-of-practice/file</a>		
<b>Government of Canada (Alberta)</b>	Ministry of Environment and Sustainable Resource Development	Northeast Alberta Operating Ground Rules
<a href="http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/formain15749/\$file/Alpac-OperatingGroun-dRules-Mar2015.pdf?OpenElement">http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/formain15749/\$file/Alpac-OperatingGroun-dRules-Mar2015.pdf?OpenElement</a>		
<b>Government of Canada (New Brunswick)</b>	Natural Resources New Brunswick (2004)	Guidelines for ROADS AND WATERCOURSE CROSSINGS (also available in French)

<a href="http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/Publications/Roads-WatercourseCrossings.pdf">http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/Publications/Roads-WatercourseCrossings.pdf</a>		
<b>Government of Canada (New Brunswick)</b>	<i>Natural Resources New Brunswick (2012)</i>	New Brunswick Scaling Manual 4th Edition July
<a href="http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/ScalingManual4EditionJuly2012.pdf">http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/ScalingManual4EditionJuly2012.pdf</a>		

### Conflict Resolution: Remedies and Reform

This section includes material related to responses to performance shortfalls (that may occur on either side of a contract), including information related to audit, supervision, and conflict resolution.

<b>Government of Canada (New Brunswick)</b>	Natural Resources New Brunswick (2014)	Forest Operations Compliance Audit Performance Indicators April Reference 867-01
<a href="http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/AuditPerformanceIndicators.pdf">http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/AuditPerformanceIndicators.pdf</a>		
<b>Government of Canada (New Brunswick)</b>		2014 Forest Operations Compliance Audit Compliance Action Plan Requirements May 2
<a href="http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/ComplianceActionPlanRequirements.pdf">http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/ForestsCrownLands/ComplianceActionPlanRequirements.pdf</a>		
<b>Government of Canada (Alberta)</b>	Forest Management Planning Standard Interpretive Bulletin: Stewardship Reporting Requirements (2017)	Provides stewardship report content and expectations for all Alberta timber disposition holders.
<a href="http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/formain15749/\$FILE/af-fdp-2017-03-stewardship-reporting-requirements-interpretive-bulletin.pdf">http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/formain15749/\$FILE/af-fdp-2017-03-stewardship-reporting-requirements-interpretive-bulletin.pdf</a>		
Ivec, M. and V. Braithwaite.	(2015) Applications of Responsive Regulatory Theory in Australia and Overseas: Update. Canberra: Regulatory Institutions Network, Australian National University.	Provides an expanded set of examples of responsive regulation applications or aspects of responsive thinking, both in Australia and overseas
<a href="http://regnet.anu.edu.au/sites/default/files/publications/attachments/2015-05/Occasional%2520Paper%252023-Ivec_Braithwaite_0.pdf">http://regnet.anu.edu.au/sites/default/files/publications/attachments/2015-05/Occasional%2520Paper%252023-Ivec_Braithwaite_0.pdf</a>		
<b>U.S. Institute for Environmental Conflict Resolution</b>	Project Case Summaries	
<a href="https://www.udall.gov/OurPrograms/Institute/ProjectCaseSummaries.aspx">https://www.udall.gov/OurPrograms/Institute/ProjectCaseSummaries.aspx</a>		
Morgan, Bobbye Leigh, Sandra Lee, and Paul Mullen, ed.	Environmental Conflict Resolution GUIDEBOOK	This guidebook outlines the technical aspects of mediations in which the environment is the fundamental point of dispute.
<a href="https://localgovt.files.wordpress.com/2017/02/ecr-guidebook-final_12-12-16.pdf">https://localgovt.files.wordpress.com/2017/02/ecr-guidebook-final_12-12-16.pdf</a>		
Jane Elix	2008 Best Practice Strategies and Techniques in the Resolution of Public Disputes over Natural Resources	Collaborative Water Planning: Context and Practice Literature Review Volume 2 September
<a href="http://www.nespnorthern.edu.au/wp-content/uploads/2016/07/COLLAB-WATER-PLANNING-Vol-2-Jane-Elix-Final.pdf">http://www.nespnorthern.edu.au/wp-content/uploads/2016/07/COLLAB-WATER-PLANNING-Vol-2-Jane-Elix-Final.pdf</a>		

Brown, Scott, Christine Cervenak, David Fairman	Alternative Dispute Resolution Practitioners Guide. Conflict Management Group.	
<a href="https://www.usaid.gov/sites/default/files/documents/1868/200sbe.pdf">https://www.usaid.gov/sites/default/files/documents/1868/200sbe.pdf</a>		

## References

Barletti, Juan Pablo Sarmiento and Anne M. Larson, with Antoine Libert Amico, Kristen Evans, Natalia Cisneros, Joanna Durbin and Laura Kowler. 2018. "Does the monitoring of local governance improve transparency? Lessons from three approaches in subnational jurisdictions." CIFOR infobrief No. 234, November. <https://www.cifor.org/library/7048/>.

Blundell, Arthur. 2018. "The Potential for the EITI to Bring Transparency to the Forest Sector in Myanmar." Forest Trends Information Brief, January. [https://www.forest-trends.org/wp-content/uploads/2018/04/doc\\_5726.pdf](https://www.forest-trends.org/wp-content/uploads/2018/04/doc_5726.pdf).

Brown, David, Kate Schreckenber, Gill Shepherd, and Adrian Wells. 2002. "ODI Forestry Briefing: Forestry as an Entry Point for Governance Reform." ODI Forestry Briefing Number 1, April 2002. <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/798.pdf>.

Castrén, Tuuka and Madhavi Pillai. 2017. "Using ICT to Improve Forest Governance." In *ICT in Agriculture (Updated Edition): Connecting Smallholders to Knowledge, Networks, and Institutions*, Module 15, 401-432. Washington, DC: World Bank.

Cerutti, P. O., G. Lescuyer, S. Assembe-Mvondo, and L. Tacconi. 2010. "The Challenges of Redistributing Forest-related Monetary Benefits to Local Governments: A Decade of Logging Area Fees in Cameroon." *International Forestry Review* 12 (2): 130-138.

Columbia Centre on Sustainable Investment. 2015. "Guide to Forestry Contracts: Understanding Key Provisions." October. <http://ccsi.columbia.edu/files/2016/10/GuidetoForestryContracts.pdf>.

Cramton, P. 2007. "How Best to Auction Oil Rights." In *Escaping the Resource Curse*, edited by M. Humphreys, J. Sachs and J. Stiglitz, 114-132. New York: Columbia University Press.

FAO. 2001. "Governance principals for concessions and contracts in public forests." Paper 139. Rome: FAO. <http://www.fao.org/3/y1398e/y1398e.pdf>

FAO. 2003. *State of the World's Forests*. Rome: FAO.

FAO. 2014. *State of the World's Forests: Enhancing the socioeconomic benefits from forests*. Rome: FAO.

FAO. 2016a. *State of the World's Forests: Forests and agriculture: land-use challenges and opportunities*. Rome: FAO.

FAO. 2016b. *Global Forest Resources Assessment 2015*. Second Edition. Rome: FAO.

FAO and EFI. 2018. "Making Forest Concessions in the Tropics Work to Achieve the 2030 Agenda: Voluntary Guidelines." FAO Forestry Paper 180. Rome: FAO. <http://www.fao.org/forestry/46348-01f3c79fdbca80c72eaf3f1ee5b6f83fb.pdf>.

- Fowler, Martin, Patrick Abbot, Stephen Akroyd, John Channon, and Samantha Dodd. 2011. *Forest Sector Public Expenditure Reviews: Review and Guidance Note (English)*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/436231468320666375/Forest-sector-public-expenditure-reviews-review-and-guidance-note>.
- Gaudet, Gérard and Pierre Lasserre. 2015. "The Management of Natural Resources Under Asymmetry of Information." *Annual Review of Resource Economics* 7 (1): 291–308.
- Gaudet, Gérard, Pierre Lasserre, and Ngo Van Long. 1995. "Optimal Resource Royalties with Unknown and Temporally Independent Extraction Cost Structures." *International Economic Review* 36 (3): 715-749.
- Gray, John A. 2002. *Forest Concession Policies and Revenue Systems*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/660821467997877711/pdf/multi0page.pdf>.
- Guj, Pietro, Boubacar Bocoum, James Limerick, Murray Meaton, and Bryan Maybee. 2013. *How to improve mining tax administration and collection frameworks: a sourcebook (English)*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/576391468330004326/How-to-improve-mining-tax-administration-and-collection-frameworks-a-sourcebook>
- IMF. 2012. "Fiscal Regimes for Extractive Industries: Design and Implementation." Fiscal Affairs Department. <https://www.imf.org/en/Publications/Policy-Papers/Issues/2016/12/31/Fiscal-Regimes-for-Extractive-Industries-Design-and-Implementation-PP4701>
- INTERPOL. 2016. Uncovering the Risks of Corruption in the Forestry Sector. December 9. Lyon: INTERPOL. <https://www.interpol.int/content/download/5150/file/Uncovering%20the%20Risks%20of%20Corruption%20in%20the%20Forestry%20Sector.pdf>.
- Karsenty, Alain. 2010. "Forest Taxation Regime for Tropical Forests: Lessons from Central Africa." *International Forestry Review* 12 (2): 121-129.
- Karsenty, Alain. 2016. "The contemporary forest concessions in West and Central Africa: chronicle of a foretold decline?" FAO Forest Policy and Institutions Working Paper No. 34. <http://www.fao.org/forestry/45021-04023cd52f4619cd28fe747b7e42c167f.pdf>.
- Karsenty, A. and C. Vermeulen. 2017. "Toward 'Concessions 2.0': articulating inclusive and exclusive management in production forests in Central Africa." *International Forestry Review* 19 (S2): 101-113.
- Karsenty, Alain. 2018. "The Crisis in the European Tropical Timber Sector in Central Africa." *Mongabay.Com*, August 1. <https://news.mongabay.com/2018/08/the-crisis-in-the-european-tropical-timber-sector-in-central-africa-commentary/>.
- Kishor, Nalin, Selene Castillo, and Nga Phuong Nguyen. 2015. *The political economy of decision-making in forestry: using evidence and analysis for reform (English)*. Program on Forests (PROFOR). Washington, D.C.: World Bank. <http://documents.worldbank.org/curated/en/635501468180853227/The-political-economy-of-decision-making-in-forestry-using-evidence-and-analysis-for-reform>.
- Kishor, Nalin and Richard Damania. 2007. "Crime and Justice in the Garden of Eden." In *The Many Faces of Corruption: Tracking Vulnerabilities at the Sector Level*, edited by J. Edgardo Campos and Sanjay Pradhan, 89–114. Washington, DC: World Bank. <https://openknowledge.worldbank.org/bitstream/handle/10986/6848/399850REPLACEM101OFFICIAL0USE0ONLY1.pdf?sequence=1&isAllowed=y>.

Kong, J. and M. Rönqvist. 2014. "Coordination between strategic forest management and tactical logistic and production planning in the forestry supply chain." *International Transactions in Operational Research* 21 (5): 703-735.

Krelove, R. and O. Melhado. 2010. "Forestry taxation in Africa: The cases of Liberia and Gabon." *International Forestry Review* 12 (2): 2010.

Leruth, Luc, Remi Paris, and Ivan Ruzicka. 2000. "The Complier Pays Principle: The Limits of Fiscal Approaches Toward Sustainable Forest Management." IMF Working Paper, Fiscal Affairs Department, March. <https://www.imf.org/external/pubs/ft/wp/2000/wp0051.pdf>.

Magrath, William B, Richard L Grandalski, Gerald L Stuckey, Garry B Vikanes, and Graham R Wilkinson. 2007. *Timber Theft Prevention: Introduction to Security for Forest Managers*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/258371468246330490/pdf/412420EAP0Timber0theft0P09811101PUBLIC1.pdf>.

McClure, Nathan. 2009. "A General Description of the Timber Supply Chain in Georgia and the Southern United States." Forest Utilization Department Georgia Forestry Commission. <http://www.gfc.state.ga.us/utilization/forest-biomass/biomass-for-industry/TimberSupplyChaininGeorgiaandtheSouthernUnitedStates-July2009.pdf>

Natural Resource Governance Institute. 2014. *Natural Resource Charter*. Second Edition. [https://resourcegovernance.org/sites/default/files/documents/nrcj1193\\_natural\\_resource\\_charter\\_19.6.14.pdf](https://resourcegovernance.org/sites/default/files/documents/nrcj1193_natural_resource_charter_19.6.14.pdf).

Neill, Katharine A, and John C. Morris. 2012. "A Tangled Web of Principals and Agents: Examining the Deepwater Horizon Oil Spill through a Principal – Agent Lens." *Politics & Policy* 40 (4): 629-656.

Ongolo, S. and A. Karsenty. 2015. "The Politics of Forestland Use in a Cunning Government: Lessons for Contemporary Forest Governance Reforms." *International Forestry Review* 17 (2): 2015–2195.

Paudel, A. and G. Weiss. 2013. "Fiscal Policy and Its Implication for Community Forestry in Nepal." *International Forestry Review* 15 (3): 348–54.

Petersen, R., C. Davis, M. Herold, and V. De Sy. 2018. "Tropical Forest Monitoring: Exploring the Gaps Between What Is Required and What Is Possible for REDD+ and Other Initiatives." World Resources Institute Working Paper, June. Washington, DC: World Resources Institute. <https://wriorg.s3.amazonaws.com/s3fs-public/ending-tropical-deforestation-tropical-forest-monitoring.pdf>

Repetto, Robert and Malcolm Gillis, eds. 1988. *Public Policies and the Misuse of Forest Resources*. Cambridge: Cambridge University Press.

Reuters. 2018. "Indonesia Unveils More Detailed Land Map in Bid to Resolve Development Planning Disputes." December 11. <https://www.reuters.com/article/us-indonesia-forest/indonesia-unveils-more-detailed-land-map-in-bid-to-resolve-development-planning-disputes-idUSKBN1OA0AK>.

Romero, C., E.O. Sills, M.R. Guariguata, P.O. Cerutti, G. Lescuyer and F.E. Putz. "Evaluation of the impacts of Forest Stewardship Council (FSC) certification of natural forest management in the tropics: a rigorous approach to assessment of a complex conservation intervention." *International Forestry Review* 19 (S2): 36-49.

Rosenbaum, Kenneth L. 2004. "Illegal Actions and the Forest Sector: A Legal Perspective." In *Illegal Logging in the Tropics: Strategies for Cutting Crime*, eds. Ramsay Ravenel, Ilmi Granoff, and Carrie Magee, 263-292. New York: Haworth Press Inc.



Ross, M. 2001. "Timber Booms and Institutional Breakdown in Southeast Asia." Cambridge: Cambridge University Press.

Shahab, Nabiha. 2016. "Indonesia: One Map Policy." Open Government Partnership (OGP) Case Study. First edition, December. [http://live-ogp.pantheonsite.io/sites/default/files/case-study\\_Indonesia\\_One-Map-Policy\\_0.pdf](http://live-ogp.pantheonsite.io/sites/default/files/case-study_Indonesia_One-Map-Policy_0.pdf).

Sundström, Aksel. 2016. "Understanding Illegality and Corruption in Forest Governance." *Journal of Environmental Management* 181: 779–90.

Takao, Gen, Hari Priyadi, and Wim Ikbal Nursal, eds. 2010. "The operational role of remote sensing in forest and landscape management: Focus group discussion proceedings." Center for International Forestry Research (CIFOR). <http://www.jstor.org/stable/resrep02113>.

UNEP. 2018. *The State of Knowledge of Crimes that have Serious Impacts on the Environment*. Nairobi: UNEP.

van Hensbergen, Berty. 2016. "Forest Concessions: Past Present and Future?" FAO Forestry Policy and Institutions Working Paper 36. Rome: FAO. <http://www.fao.org/forestry/45024-0c63724580ace381a8f8104cf24a3cff3.pdf>.

Webb, J., R. Petersen, E. Moses, C. Excell, M. Weisse, E. Cole and S. Szoke-Burke. 2017. "Concessions Data Transparency: A Survey of 14 Forested Countries." World Resources Institute Working Paper, March. Washington, DC: World Resources Institute. <https://www.wri.org/publication/logging-mining-and-agricultural-concessions-data-transparency>.

Whiteman, A. and A. Lebedys, A. 2006. "The Contribution of the Forestry Sector to African Economies," *International Forestry Review* 8 (1): 31–43.

World Bank. 2005. *Forest Institutions in Transition: Experiences and Lessons from Eastern Europe*. Europe and Central Asia Region ECSSD. Washington, DC: World Bank.

World Bank. 2011. "Project Performance Assessment Report, Tanzania: Forest Conservation and Management Project." Public Sector Evaluations (IEGPS) Independent Evaluation Group. Report No. 62769. Washington, DC: World Bank.

World Bank. 2013. "Republic of Belarus Forest Sector Policy Note." Report No. ACS4416. Washington, DC: World Bank.

World Bank. 2014a. *Climate Change Public Expenditure and Institutional Review Sourcebook*. Washington, DC: World Bank.

World Bank. 2014b. "Moving Toward Climate Budgeting: Policy Note." Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/21036>.

World Bank. 2014c. "Project Performance Assessment Report: Ghana" on three Natural Resources and Environmental Governance Development Policy Operations. IEG Public Sector Evaluation Report No. 88959. Washington, DC: World Bank.

World Bank. 2016. *World Bank Group Forest Action Plan FY16–20*. Washington, DC: World Bank.

World Bank. 2019a (forthcoming). *Fiscal Instruments for Sustainable Forests*. Washington, DC: World Bank.

World Bank, 2019b (forthcoming). "Regulatory Tools, Effective Markets, and Private Sector Participation in the Forestry and Wood Products Processing Sectors: Issues and Solutions for Developing Countries." Washington, DC: World Bank.

WWF. 2018. *Living Planet Report - 2018: Aiming Higher*. M. Grooten and R.E.A. Almond, eds. Gland, Switzerland: WWF.

Zimmerman, Barbara L. and Cyril F. Kormos. "Prospects for Sustainable Logging in Tropical Forests." *BioScience* 62 (5): 479–487.