

Case study 2 - Forest Concession Monitoring : Lessons Learned from the CARPE Program *World Resources Institute*

Pierre Méthot, Matthew Steil



Introduction

The objective of this paper is to share the most relevant lessons that WRI has learned on forest concession monitoring in Central Africa (CA) through its USAID-CARPE funded activities with CARPE, its partners, and other stakeholders.

Forest monitoring and WRI objectives and goals

WRI's overall mission statement is "to move human society to live in ways that protect Earth's environment and its capacity to provide for the needs and aspirations of current and future generations". Its contribution to CARPE falls under WRI's People and Ecosystems Program's goal of reversing the rapid degradation of ecosystems and assuring their capacity to provide humans with needed goods and services. More specifically, through its Forest Information and Govern-

nance Initiative, WRI seeks to:

"...increase the capacity of governments, businesses, and civil society to act upon better and more widely-shared information to protect intact forests, manage working forests more effectively, and restore deforested lands".

The main premise behind WRI's forest strategy is that the provision of accurate, user-friendly information will promote more sustainable forest management (SFM) practices when linked to relevant decision-making and capacity-building efforts coupled with making this information publicly available as a means to hold decision makers accountable for their actions.

WRI's niche is the provision of accurate, credible, accessible and timely forest landscape information and the promotion of its inclusion in decision making. This information is developed through strategic partnerships with national, regional and

international actors (private sector, governments, multilateral and bilateral agencies, research institutes, and local and international NGOs). WRI's ability to work across multiple levels (local, national, regional and international) and sectors is crucial to its effectiveness in connecting forest information to the variety of decision-making processes focused on strengthening forest management in Central Africa. This includes its ability to draw on WRI's experience in other forest-rich regions, including Southeast Asia, Russia and South America. Other players in the region typically focus at the site scale (i.e., specific protected areas or landscapes).

In that respect, WRI's mission, goals, objectives and programmes respond directly to CARPE's strategic objective, which is to :

“reduce the rate of forest degradation and loss of biodiversity through increased local, national and regional natural resource management capacity in nine Central African countries: the Central African Republic, Equatorial Guinea, Gabon, Republic of Congo, Burundi, Cameroon, Rwanda, Sao Tome & Principe and the DRC”.

The above highlights the compatibility between WRI's involvement in forest concession monitoring in Central Africa and USAID-CARPE's goals.

The need for forest concession monitoring

Monitoring production forests

Forest concessions and other logging titles (e.g., council or communal forests, sales of standing volumes, etc. – “production forests” writ large) represent the vast majority of classified forest in the forested countries of Central Africa (Figure 1). Within these forests exist immense and valuable renewable resources: from the timber itself targeted by the extractive industries to the non-timber forest products (e.g., bushmeat, fruits, nuts, medicinal plants, etc.) on which local populations are largely dependent for subsistence, to ecosystem services provided (locally and globally) from an intact tropical forest ecosystem.

Additionally, logging titles form much of the connecting forested corridors between protected areas. Therefore, maintaining current production forests as integral habitats with viable floral and faunal populations is integral to conservation planning at both the landscape and regional scale. The monitoring of resource extraction activities occurring within production forests is critical in addressing issues of legality and SFM, as well as for providing information on how land use within these areas affects the overall landscape.

Status of commercial logging in the Congo Basin

While commercial logging does not officially constitute more than 15 percent of GDP in any of the countries of the region, it is the most important sector in terms of occupied forest surface area and formal employment for most of the region's countries. On a positive note, the last 10–15 years have seen improvements in the commercial forest sector in Central Africa, particularly in terms of generally adhering to SFM practices, establishing a clear definition of the legal boundaries of logging titles, building the capacity to actually monitor logging activities, contributing to the improvement of local livelihoods and, finally, pursuing certification or other legality standards.

On the other hand, however, industrial logging continues to extend into areas of the Congo Basin not previously exploited, thus opening up these new areas to pressures from hunting, forest degradation and/or conversion. Furthermore, while some companies have committed to best practices (environmental and social) in their activities, many continue to operate outside environmental and social dictates, and institutional capacity to enforce adherence to the law or management plan obligations remains weak.

Objectives of forest monitoring

Forest concession monitoring

The monitoring of activities in production forests and more generally in forested areas allows stakeholders to address several important issues.

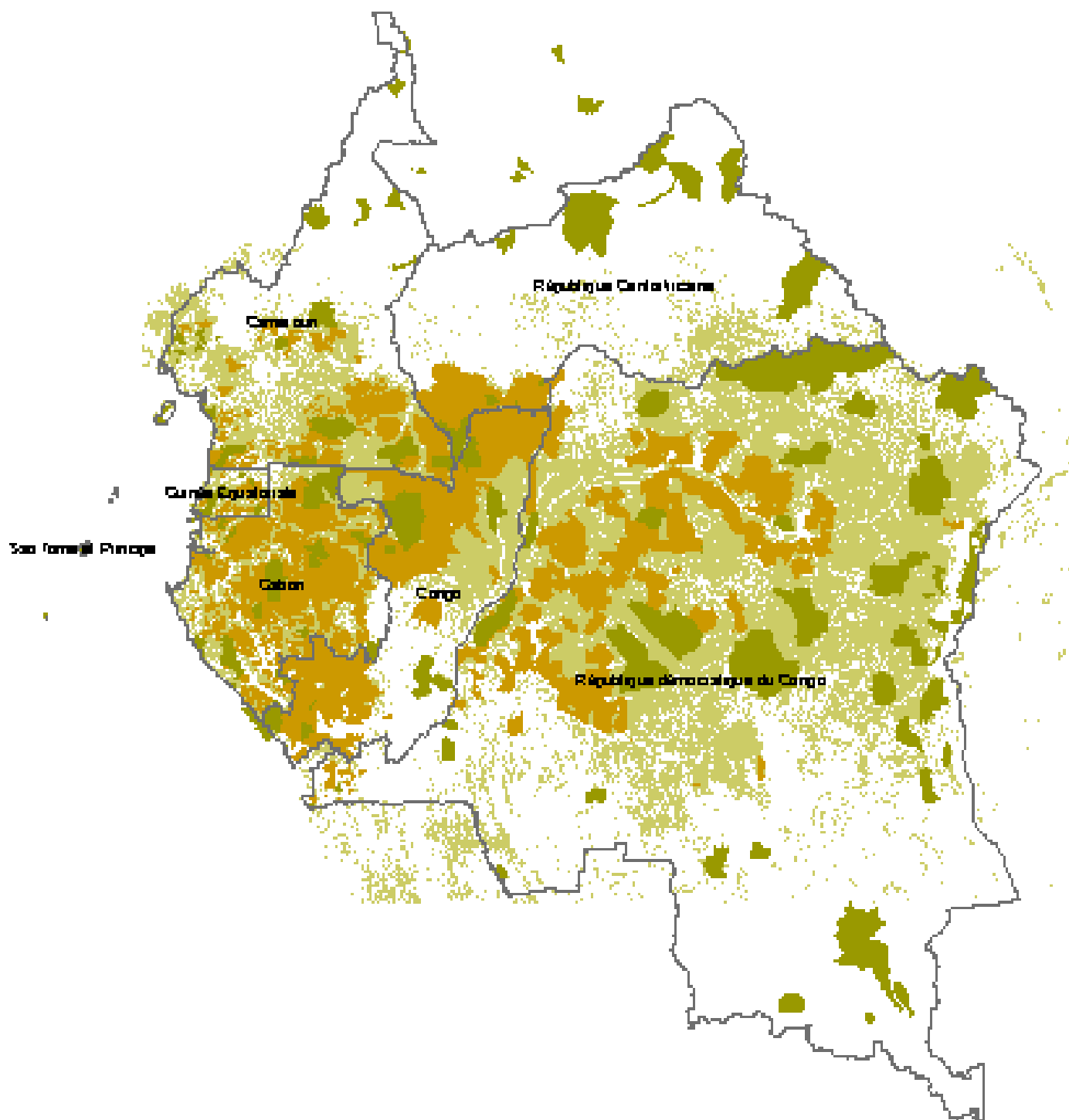


Figure 1. Distribution of forest concessions, protected areas and dense tropical forest cover in Central Africa

Key : Brown – forest concessions; dark green – protected areas; light green – dense tropical forest cover.

Some general environmental and social applications for example include :

- Monitoring and measuring forest cover change over time;
- Determining drivers of deforestation or forest degradation, notably through slash-and-burn agriculture;
- Monitoring and mapping the extension of road infrastructure;
- Monitoring environmental compliance;
- Combating illegal trade of bushmeat;
- Monitoring populations of key indicator species to measure impacts and guide mitigation.

tion;

- Informing landscape management of plants and animals;
- Addressing issues of resource-use overlap with local populations.

When done well, commercial logging can be a sustainable contributor to local employment and the national economy; when executed poorly it can be a purveyor of forest degradation, local impoverishment, corruption and tax evasion. Monitoring commercial logging activities can provide necessary information to support the enforcement of national laws and development goals as well as help ensure that these activities are carried out within the realm of SFM and that they contribute to local wellbeing. With regard to logging activities, the main applications of forest monitoring include :

- Combating illegal logging outside legally allocated logging titles (forest concessions and annual logging coupes) or inside protected areas;
- Combating illegal activities related to logging such as non- or under-reporting of logs felled, harvesting forbidden species, felling below authorized minimum diameters, deliberately reporting wrong species, etc.;
- Enhancing the ability of the ministries in charge of forests to carry out more targeted enforcement of logging infractions, thus reducing the overall costs of field controls;
- Monitoring implementation of sustainable forest management plans;
- Monitoring adherence to allotted annual volume or surface area restrictions;
- Informing stakeholders of the requirements and effectiveness of certification programmes with the aim of moving towards more socially responsible and environmentally sustainable logging;
- Verifying compliance of logging companies to the social contracts (cahier des charges);
- Verifying compliance with forest certification and legality processes;
- Monitoring contribution of industrial logging to local livelihoods, notably through the payment and redistribution of area and volume-based forest taxes.

Complementary initiatives

In addition to addressing the immediate needs listed above, monitoring production forests and forested areas contributes valuable information that informs ongoing and proposed bilateral, multilateral and international initiatives. Amongst actual and potential beneficiaries are :

- Carbon sequestration initiatives related to climate change;
- The World Bank programme to reduce emissions from deforestation and degradation (REDD);
- Timber trade agreements such as the European Union's Forest Law Enforcement, Governance and Trade (FLEGT) process;
- Convention on Biological Diversity and other global biodiversity conservation initiatives (e.g., IUCN's Red List).

Methodology of forest concession monitoring

Integrated approach to forest concession monitoring

Forest concession monitoring, especially if it aims to combat illegal logging, requires an integrated approach that encompasses three un-dissociable components :

1. Ways or tools to identify ongoing activities: Remote sensing (RS) and field controls;
2. Indicators to measure or assess those activities: Criteria and indicators, notably of legality and of sustainable forest management;
3. Ways to collect, process, verify and communicate the information collected on the activities : *Geographical Information Systems (GIS)*, *Interactive Forest Atlases*, *Forest Information Management Systems (FIMS)*.

WRI activity in Central Africa over the last several years covers all three of these components, to varying degrees. WRI has also provided input and support to the FLEGT and other forest certification processes, thus further contributing to fo-

rest concession monitoring and the fight against illegal logging.

Remote sensing and field controls

The forest concession monitoring work performed by WRI under CARPE in Central Africa has not been limited to forest concessions, but extended to include all types of logging titles, such as communal and community forests and annual logging coupe sales as well as protected areas (national parks, game ranches, reserves, etc.). Consequently it is best to discuss forest monitoring at large, rather than simply forest concession monitoring.

There are basically two major methods by which

to identify ongoing activities in the forests: remote sensing and field controls. Each of these two methods has their advantages and limitations, as can be seen in Table 1 below :

It is important to note that neither of these methods is a practical or complete forest monitoring method in isolation – rather that they are best used complementarily to achieve some effective results. WRI has limited its efforts to remote sensing and has not been involved in actual field controls of logging or other forest-related activities other than validating limits of forest titles and forest roads identified through RS, notably through the use of GPS. The information generated by WRI with remote sensing has, however, been widely used by other forest actors to actually conduct field controls, notably the ministries

Table 1. Description, advantages and limitations of the two main forest monitoring methods

Methods	Remote sensing	Field control
Description	Interpretation of satellite images or aerial photography to monitor canopy loss, forest degradation, logging activity and road building.	Physical inspection of logging activities by technical staff – generally involves the use of maps, GPS and other hand-held tools.
Advantages	<ul style="list-style-type: none"> - Covers large tracts of forest with limited costs; - Access to remote regions; - Limited staff requirements; - Provides global picture; - Limited field work needed; - Discreet. 	<ul style="list-style-type: none"> - Enables one to control a very large number of elements that can not be seen from satellite images or aerial photography (e.g., logs, stumps, bushmeat hunting, working conditions, etc.); - Information collected stands up legally; - Can be carried out with limited technical training.
Limitations	<ul style="list-style-type: none"> - Only able to detect activities visible within resolution ability of images; - Regular cloud-free satellite images difficult to get for many areas of Congo Basin; - Resolution of available images often not high enough to detect certain activities; - Technology-dependent – requires certain amount of training, software, hardware and ability to acquire necessary images; - Requires some field verification. 	<ul style="list-style-type: none"> - Requires large workforce and supporting infrastructure; - Expensive and time-consuming; - Difficult to construct global picture – site-specific; - Not capable of measuring land-use change effectively; - Leaves more room for corruption between operator and enforcement agents; - Extremely difficult to access remote areas.

in charge of forests as well as international NGOs involved in combating illegal logging and poor forest governance, such as Resource Extraction Monitoring (REM), Global Witness and Greenpeace.

Criteria and indicators

From 2003–2006, WRI was active in developing and promoting the implementation of a step-wise approach to forest certification in Central Africa, in partnership with IUCN and the InterAfrican Forest Industries Association (IFIA). This Forest Concession Monitoring System (FORCOMS) was conceptualized as a voluntary and independent monitoring system that would provide information on the status of the legality of the logging and wood-processing operations and on the actual commitment to SFM of the participating forest concessionaires. Legality and the meeting of certain environmental and social criteria were to

be third-party verified through a specific set of targeted indicators (see Figure 2 for outline of structure). This was not meant to be another certification or legality verification system, however; rather, it was intended to support ongoing initiatives in filling the large gap between the certified and non-certified actors in the region. FORCOMS was developed to be the first step towards meeting baseline legality standards and towards the eventual achievement of certification (Figure 3).

GIS, Interactive Forest Atlases, FIMS

GIS and Interactive Forest Atlases

Most WRI activities within CARPE over the last seven years have focused around the development and implementation of remote sensing, GIS and mapping tools to monitor activities within or surrounding logging titles and protected areas. The culmination of these activities is the deve-

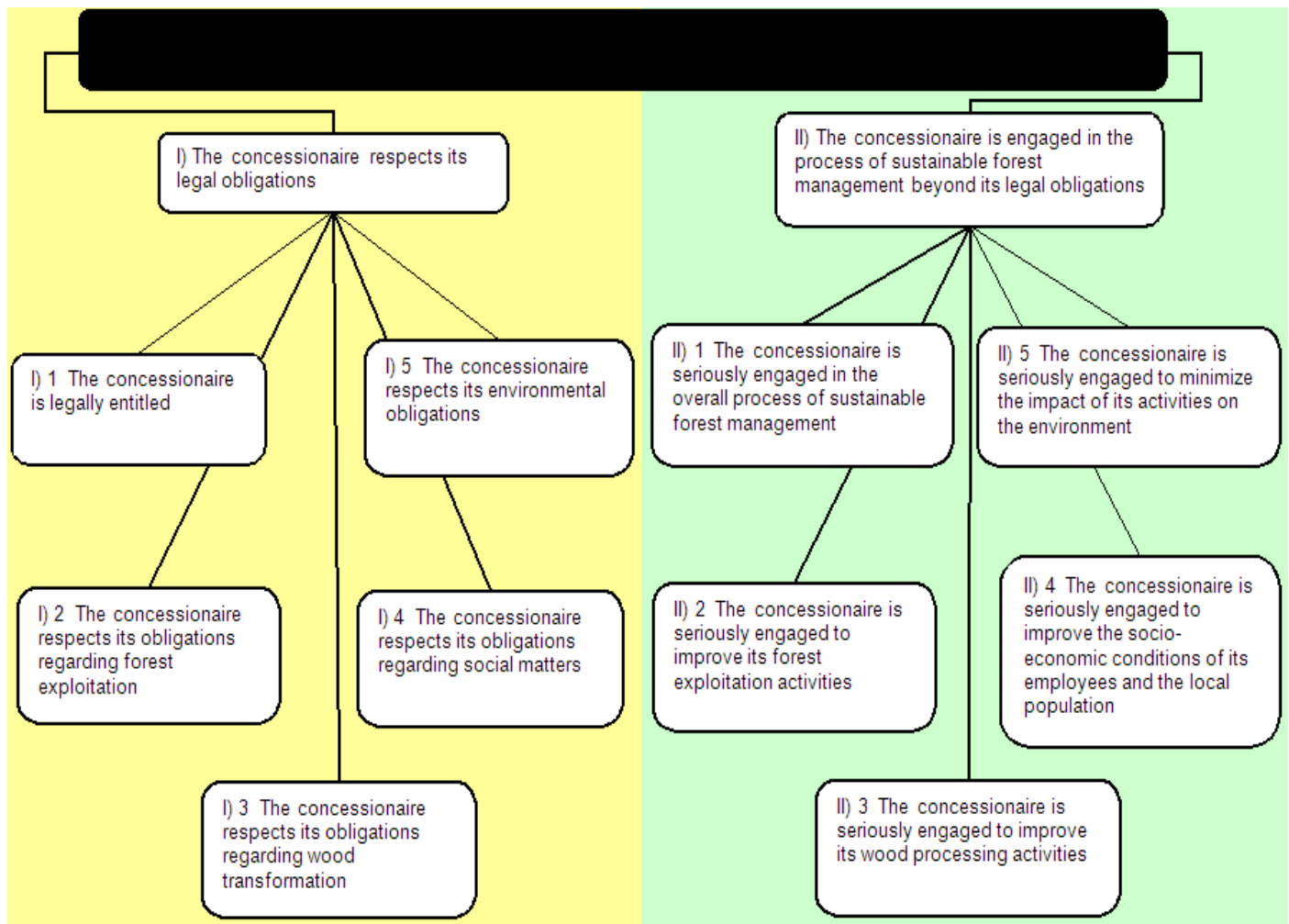


Figure 2. FORCOMS means of assessment architecture

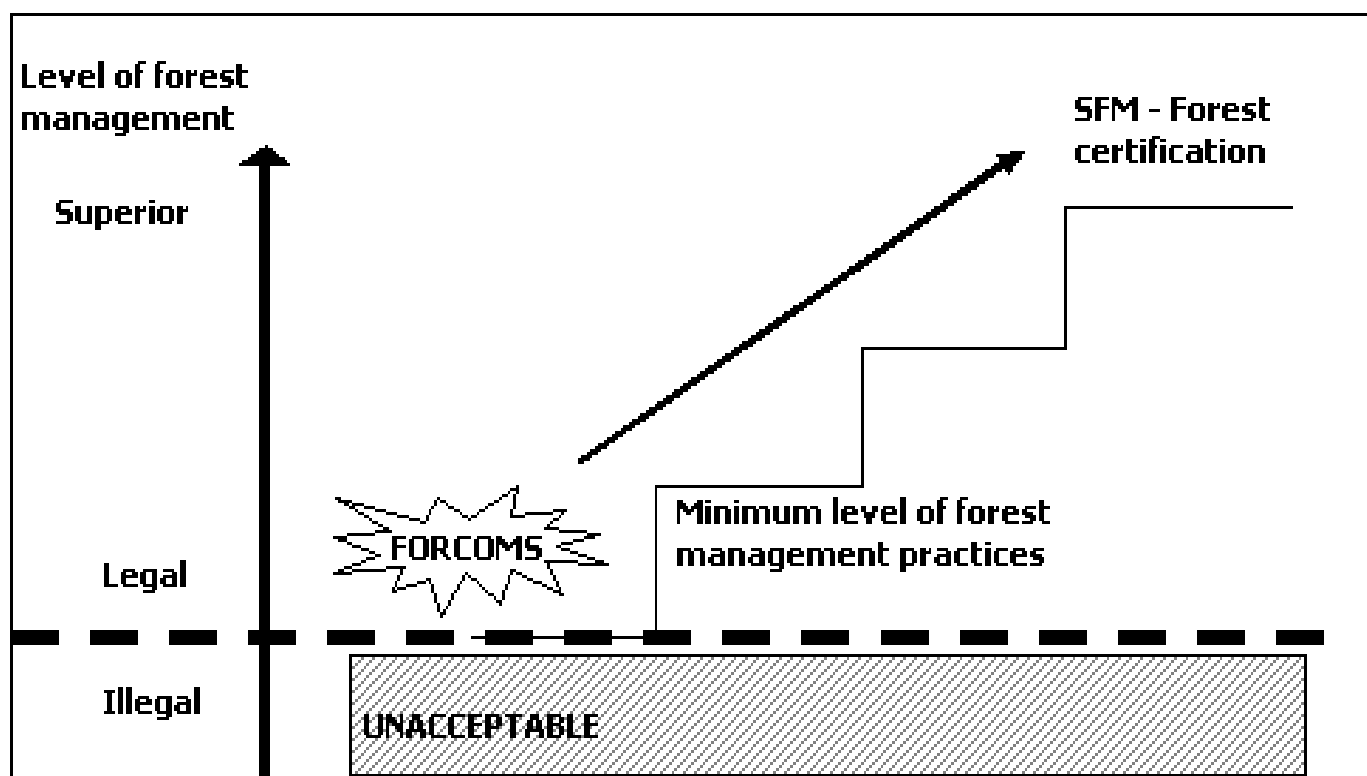


Figure 3. Presentation of FORCOMS and step-wise certification scheme

lopment and dissemination of the interactive forest atlases and related products (see Figure 4).

The aim of developing these tools and associated activities is to :

- Provide and map verified geo-referenced boundaries of all logging titles and protected areas;
- Locate, qualify, date and map the forest roads and trails within and outside forest titles and protected areas;
- Partner with host country forest ministries to collect, process and disseminate this information;
- Build local capacity in remote sensing, GIS and mapping to carry out the monitoring of logging titles.

The GIS and Interactive Forest Atlases databases, and the Forest Information Management Systems, are cross-feeding each other with useful forest monitoring information.

Forest Information Management Systems (FIMS)

Since 2006, WRI has been working with the Ministry of Forests in both the Republic of Congo (RoC) and the Democratic Republic of Congo (DRC) to design and implement an integrated computer-based Forest Information Management System (FIMS, or SIGEF – Système d'Information de Gestion Forestière – in French).

The FIMS is a an important decision-support tool that allows for the collection, processing, control and publication of data pertaining to commercial logging, log and wood products declaration, wood processing, and forest taxes (see Figure 5).

The FIMS is comprised of two integrated sub-systems: a computerized forest accounting system and a physical log tracking system. The forest accounting system allows for the collection, processing and logical (e.g., paper trace) validation of data. The forest accounting system can, for instance, trace the various operational steps through the value-chain of a log ready to be exported, from the actual allocation of a valid logging title, to pre-harvesting forest inventory, felling, skidding, transport, storage and finally loading onto a sea-going vessel or entering into wood-processing plants. Finished product (sawn wood, plywood, etc.) value-chains can also be

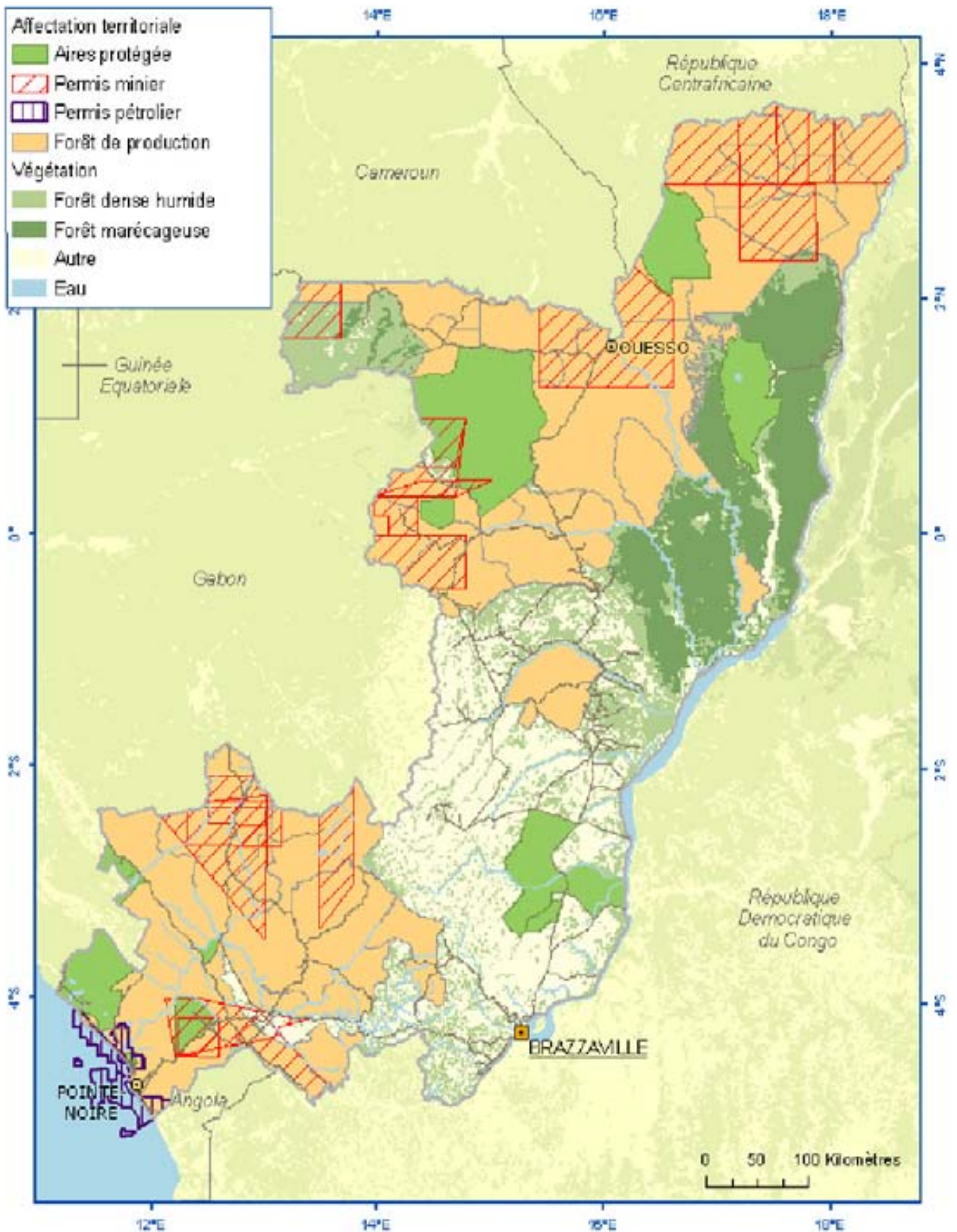


Figure 4: Distribution of production forests, protected areas, mining and oil permits in the Republic of Congo

Source : Spatial data and map developed through the Interactive Forest Atlas 1.0 for Congo.

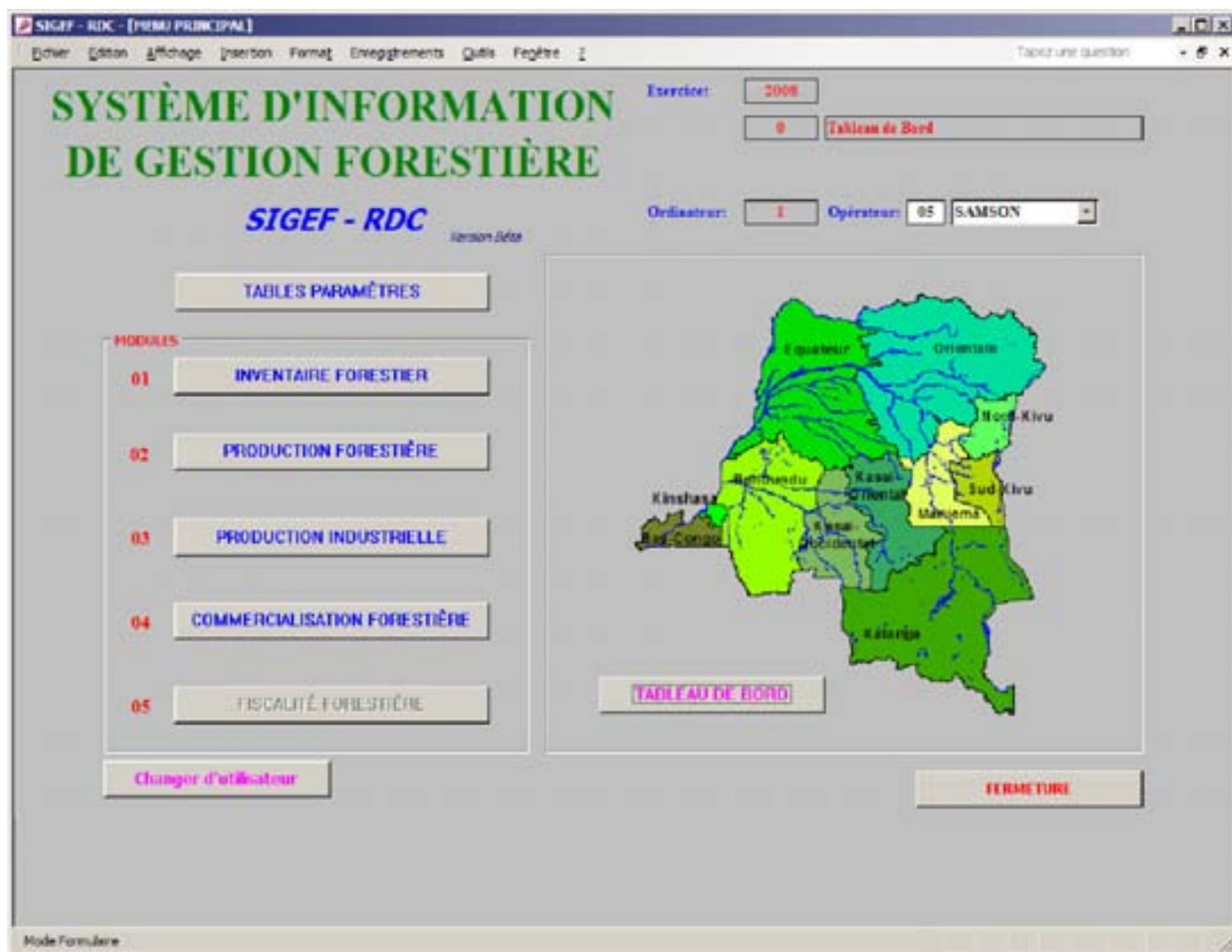


Figure 5. Presentation of FIMS database interface

tracked with the FIMS. The log tracking system allows for the actual physical field control of the validity of the data fed into the forest accounting system. Log tracking is thus one of the numerous required field verifications for a complete forest concession monitoring system. The log tracking system now in use in Central Africa is based on paint numbering on logs and a set of paper supports for every step of the value-chain, such as the DF10 in Cameroon to report volumes logged. More modern log tracking systems use bar-coding with hand-held computers to scan, verify and communicate the data directly to the forest accounting system.

Through deployment in all Ministry of Forestry departments and active logging companies, FIMS allows for the government to monitor logging activities much more effectively throughout the country as well as over time. Anticipated results include increased capture of forest tax revenue,

improved monitoring of management plan implementation, and an overall reduction in illegal logging and corruption in the sector. When fully operational, the FIMS will enable countries like RoC and DRC more easily to meet the Voluntary Partnership Agreement (VPA)'s legality requirements being negotiated under FLEGT.

Support to FLEGT and forest certification processes

WRI has been providing direct and indirect support to FLEGT and forest certification initiatives in Central Africa notably through: a) the provision of spatial information on forest concessions (Interactive Forestry Atlases); b) FORCOMS legality and sustainable management indicators; c) development and deployment of FIMS; and d) participation in sub-regional meetings.

Results achieved

Interactive Forest Atlases – remote sensing, GIS and mapping

The use of the Interactive Forest Atlases as a tool, the dissemination of verified spatial and non-spatial data on logging titles to involved stakeholders and all levels of the forest administration, together with capacity building in remote sensing and GIS, has enabled the participating governments and collaborating partners to better monitor logging titles by :

- Assessing where illegal logging might have taken place in recent years;
- Improving administration capacities and knowledge for monitoring and control activities; and
- Enabling the administration to avoid future conflicts in forest production areas.

Over the course of working with the ministries in charge of forests in five countries of the sub-region over the past seven years, WRI has achieved some significant results towards improved definition of legality in the forest sector and the monitoring of logging titles. Some of the major achievements generated through these activities include :

- Versions 1.0 and 2.0 of the Interactive Forest Atlas in Cameroon and version 1.0 in RoC have helped these respective governments to resolve commercial disputes over boundaries between logging titles as well as between logging titles and protected areas.
- The Congolese Ministry of the Forest Economy has been able to make more efficient use of limited enforcement personnel and resources by using information contained within the Interactive Forest Atlas to identify suspected cases of logging encroachment and thus more effectively target field control missions by the Ministry's agents.
- In Cameroon, the Atlas data and derived products (i.e., maps, GPS points, satellite images, road datasets, etc.) are extensively used by CETELCAF (the Ministry of Forest technical unit in charge of producing forest title maps and definitions) and the Control Brigades in order to access information with

improved accuracy, and plan and support field missions. One of the more notable examples was the identification of logging in the Mengamé Gorilla Sanctuary by the neighbouring concessionaire (see Figure 6).

- GIS mapping tools enabled the Congolese government to verify and revise the taxable area of each forest concession using standardized and objective GIS-based surface area calculations. This exercise led to an overall increase in forest tax revenues for Congo.
- As a result of extensive training in GIS and remote sensing, the Congolese Ministry of Forest Economics is now requiring all logging companies in the country to submit their annual logging coupe requests on a GIS platform (as opposed to paper-based).
- An analysis of the current status of forest title information conducted in Gabon provided the impetus for the Gabonese government to dedicate resources and personnel to collaborate with WRI in the verification and reconciliation of forest title spatial and non-spatial data.

Additionally, indirect but very important achievements through this work included the generation of political support vis-à-vis this decision-support tool and a change in mindset regarding its utilization in lieu of the existing antiquated and inefficient systems in place, as well as the willingness of the Forest Administrations to provide the information and allow for it to be made widely public. Those are very significant steps towards transparency and improved governance in the forest sector.

Finally, through a series of capacity-building and training activities related to remote sensing, GIS, mapping and GPS, the forest administrations have been reinforced.

Criteria and indicators (FORCOMS)

For numerous reasons, FORCOMS as a system remains non-operational. However, work under FORCOMS has provided impetus and support to the concept of regional frameworks and a step-wise process to forest certification schemes. Fur-

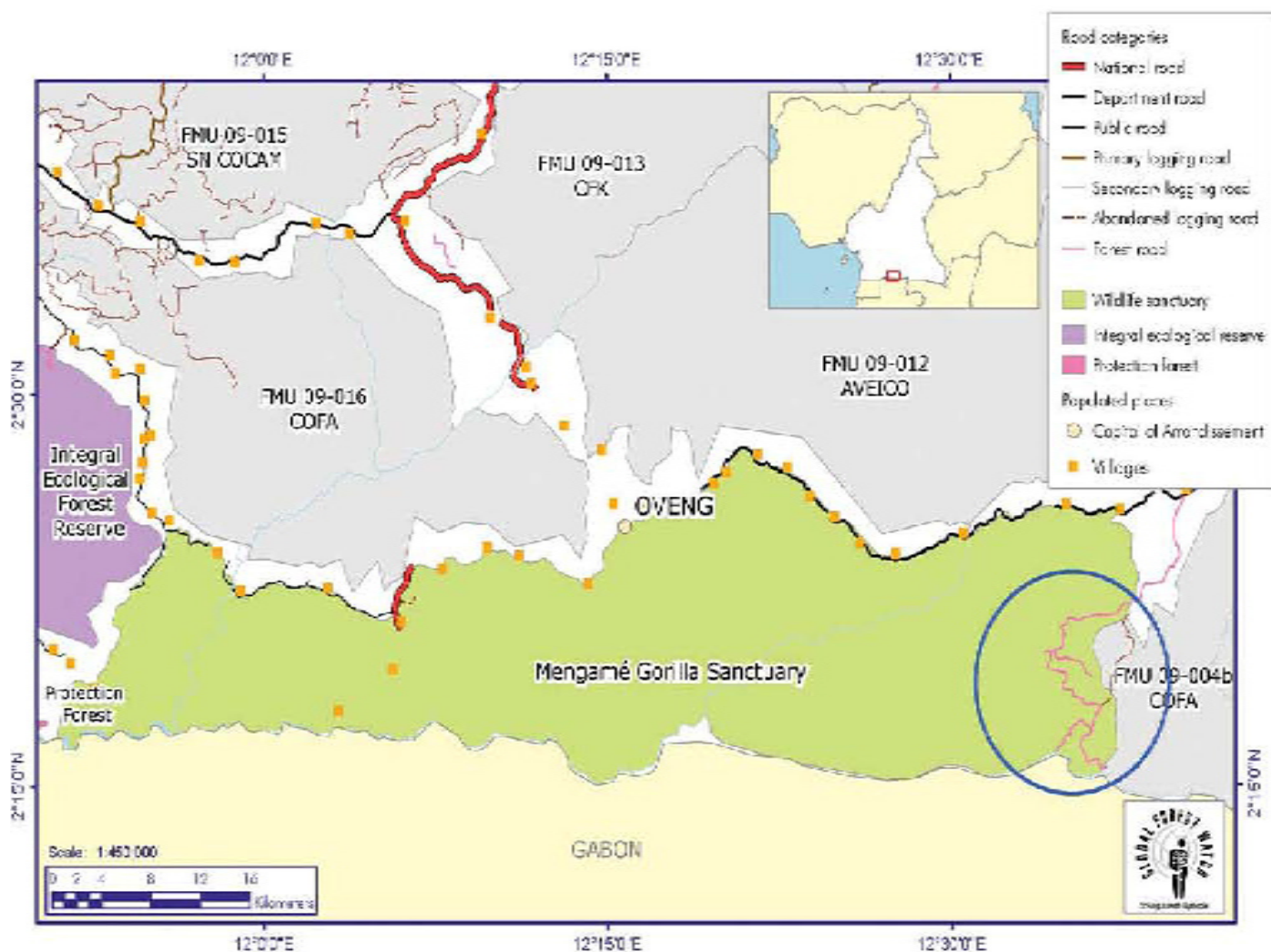


Figure 6. Presentation of logging road encroachment in a protected area in Cameroon

Source : Information and map from the Interactive Forest Atlas 1.0 for Cameroon.

thermore, it produced a complete set of indicators on legality and SFM that are being largely used by countries in the sub-region to develop their own national legality standards, notably in view of their upcoming FLEGT VPA negotiations with the EU.

Forest Information Management Systems (FIMS)

Much work has been invested up-front in the participative development of FIMS in both RoC and DRC with the host-country forest ministries, but only a test field deployment has been carried out so far. However, WRI work has thus far been limited to the forest accounting sub-system of the FIMS, with no action taken on field log tracking.

A pilot deployment of the forest accounting sub-system of the FIMS took place in the RoC during

the first half of 2008, with full national implementation to begin following successful execution of the pilot. Implementation in DRC will follow that in RoC.

As with WRI's GIS and Interactive Forest Atlas work, the FIMS work has generated some initial indirect but very important achievements by generating political support for this decision-support tool as well as a change in mindset regarding its utilization in place of the existing antiquated and inefficient systems currently in operation on the one hand, and the willingness of the forest administrations to provide the information and allow for it to be made widely public on the other hand. Those are very significant steps towards transparency and improved governance in the forest sector.

Finally, through a series of capacity-building and

training activities related to database management and forest statistics, the forest administrations have been reinforced.

Lessons learned – analysis and recommendations

The most important lessons that can be drawn from WRI's work over the past seven years in its forest monitoring activities are presented below.

Analysis

Limitations of monitoring tools

WRI's work in forest monitoring at large and with concession monitoring in particular has provided numerous practical and significant results. However, much more still needs to be done to ensure compliance with legality and SFM requirements by logging operators, as well as to better understand how current industrial logging practices are impacting the forest ecosystem in order to inform landscape and national resource management agendas. The bulk of WRI's activities revolve around the use of remote sensing, GIS and forest accounting system (databases) with only limited field control activities in support of data verification and ground control points.

While the Interactive Forest Atlases and FIMS are highly practical and effective tools, they are limited in the information they are able to provide with regards to forest concession monitoring on the ground as well as the real-time tracking of logging activities. For example, these methods are useful in determining where new roads are being built, ensuring there is no overlap between forest titles, keeping tabs on the status of forest concessions and titles, planning effective field missions, and tracking harvested logs. However, they are not directly capable of monitoring activities which are not detectable by satellite images (e.g., bushmeat hunting, overharvesting trees, creation of skidder trails, and other social and environmental obligations) or measuring change on a regular (weekly, monthly or semi-annual) basis. They are also of limited use for detecting illegal

felling of individual trees by chainsaw operators. These other activities can only be detected through on-site field verification, and thus the Atlas and FIMS tools are most effectively used in conjunction with targeted field verification – each one complementing the other. Similarly, the FIMS has to include both the forest accounting and log tracking sub-systems in order to be fully efficient.

As shown in Table 1 above, by relying on satellite imagery and GIS-based monitoring tools, the process is inherently limited by the technological constraints. In our experience, depending on Landsat images for road detection has severely limited our ability to monitor forest concessions remotely, due primarily to the malfunction and subsequent discontinuation of Landsat 7 in 2003 and lack of an affordable and comparable substitute. Furthermore, even when the images are available, large swathes of the Congo Basin are rarely cloud-free enough to be effectively observable with visible band imagery. Another type of obstacle faced is the barrier that this technology may impose to certain users who are not computer-literate.

Limitations of the approach

Besides the technical questions identified above, there are constraints accompanying our chosen approach that limit our ability to tackle forest concession monitoring, especially for combating illegal logging. Indeed, this approach :

- Puts the emphasis on law enforcement while other tools, such as putting pressure on importers of CA timber products only to buy timber from legal and sustainable operations, for instance, could have a stronger impact;
- Does not tackle the issue of the legal and regulatory environment which may not allow proper determination of legality;
- Does not take into consideration illegal activities related to wood processing, timber trade, and financial management and flows;
- Does not properly define illegal logging;
- Is not able to deal with the legal and regulatory environment varying from one country to another, thus making it difficult to have a standardized approach to illegal logging in

- CA (some activities that are illegal in one country could be legal in another);
- May be seen as taking over governments' responsibilities (e.g., law enforcement) and therefore as interference;
 - Is hampered by widespread corruption in the sector;
 - May not get cooperation from governments or logging companies ;
 - Doesn't tackle the problem of political will i.e., if there is a lack of political will to enforce laws, no amount of tools or methods are going to be effective;
 - May generate animosity and conflicts with logging companies as well as local populations with whom they have to work if we are perceived to be engaged in law enforcement activities aimed against them;
 - Is in real danger of not being able to properly and completely identify the various illegal activities and thus being seen as incompetent or inefficient; and
 - May be unwillingly perceived as green-washing certain logging companies since the monitoring is not capable of capturing all illegal activities and, as such, it may harm the international credibility of the programme.

In conclusion, a wide array of tools and actions are needed to be comprehensive and efficient in combating illegal logging. Table 2 provides a general schematic view of various factors allowing illegal activities to occur and identifies the different sets of actions and tools required to combat illegal activities.

Need for partnerships

The data required to perform forest concession monitoring has to come from various stakeholders including: the ministries in charge of the forest and their specialized services (such as the Service Permanent d'Inventaire et d'Aménagement Forestier in DRC or the Centre National des Inventaires et Aménagements Forestiers et Fauniques in Congo), the private sector (logging companies, the Société Générale de Surveillance), international NGOs (CI, WWF, AWF, IUCN, etc.), local NGOs and, finally, parliamentarians.

Solid and well-working partnerships between WRI and those main actors have to be established to ensure not only the collection of data but also the validation of the end-products, as well as the integration of the data and the tools developed by WRI into the decision-making process.

Recommendations

Taking into account the achievements to date, as well as the identified constraints and limitations, WRI proposes the following recommendations for future forest concession monitoring conducted under CARPE :

- Pursue the remote sensing, GIS and mapping activities and expand their scope both thematically and geographically;
- Pursue and intensify the FIMS work in both Congos, notably by also getting involved in the development and implementation of the log tracking sub-system and eventually by expanding to the sub-region. This will however require substantial new funding;
- Continue working on finding solutions to the lack of affordable cloud-free satellite images;
- Work to promote the involvement of new partners within the programme to assist the governments of the sub-region in conducting field verifications, in collaboration with other donors involved in that issue (such as the World Bank);
- Expand forest concession monitoring collaborations with complementary initiatives (e.g., REM, Global Witness), where feasible; and
- Work on ensuring continued strong political will so that the tools are fully incorporated in the decision-making processes.

Table 2. Main tools and actions to combat illegal logging

Factors allowing illegal activities to occur	Typical examples of illegal activities or problems generated in producing countries	Tools of measures to combat illegal logging						Stakeholders concerning monitoring dialogue
		Remote Sensing GIS and PMS	Field Monitoring including log tracking	Capacity Building	Advisory and public information	Policy, law and regulation changes	Stakeholders concerning monitoring dialogue	
ITTO's producing countries								
a) Lack of legislation	Unappropriate and unfair allocation of forest resources			X	X	X		
	Inappropriate and unfair allocation of other logging rights			X	X	X		
	Unsustainable extraction for forest management plans			X	X	X		
	Unfair benefit sharing (in case of the forest)			X	X	X		X
	Special or environmentally damaging permits			X	X	X		
	Difficulties to define terms a legal or illegal			X	X	X		
	Unenforceable regulations			X	X	X		
	Company is not legally authorized to do logging		X (PMS)					
	Logging outside authorized areas (resources or annual quotas)		X		X (GIS)			
	Logging above allocated or authorized volumes		X (PMS)					
b) Lack of law enforcement	Logging forbidden or unauthorized species		X					
	Tallying wrong species to pay licenses		X					
	Understating of volumes logged to pay licenses		X					
	Not reporting all volumes logged		X					
	Not reporting all abuses of resource control		X					
	Not paying taxes due (taxi, etc., filling open taxes, corporate, etc.)		X					
	Transporting timber products without proper authorization		X					
	All illegal activities listed in a) and b) above			X	X	X		X
	Inappropriate and unfair use of natural resources			X	X	X		X
	Inequity in benefit sharing			X	X	X		X
d) Lack of knowledge and access sharing	All illegal activities listed in b) as logging unacknowledged			X	X	X		X
	Conflicts over use of forest resources			X	X	X		X
				X	X	X		X
ITTO's consuming countries								
c) Lack of legislation	All illegal activities and problems in a), b) and c) above			X	X	X		X
				X	X	X		X
				X	X	X		X
d) Lack of legal verification and monitoring systems	All illegal activities and problems in a), b) and c) above		X	X	X	X		X
				X	X	X		X
				X	X	X		X
ITTO's monitoring and consuming countries								
b) Lack of dialogue and cooperation	All illegal activities and problems in a), b) and c) above			X	X	X		X
				X	X	X		X
c) Lack of appropriate technology	All illegal activities and problems in a), b) and c) above		X	X	X	X		X
			X	X	X	X		X

Annex

Acronyms and abbreviations

AFLEG African Forest Law Enforcement and Governance

AWF African Wildlife Foundation

CARPE USAID's Central Africa Regional Program for the Environment

CETELCAF Centre de Télédétection et de Cartographie Forestière

CI Conservation International

COMIFAC Commission des Forêts d'Afrique Centrale

FIMS/SIGEF Forest Information Management System

FLEGT Forest Law Enforcement, Governance and Trade

FORAF Forêts d'Afrique (EU-funded project)

FORCOMS Forest Concession Monitoring System

IUCN International Union for Conservation of Nature

GIS Geographical Information System

GPS Global Positioning System

NGO Non-governmental Organization

REDD World Bank programme: Reduce Emissions from Deforestation and Degradation

REM Resource Extraction Monitoring

SFM Sustainable Forest Manage-

ment

USAID United States Agency for International Development

VPA Voluntary Partnership Agreement (component of FLEGT)

WRI World Resources Institute

WWF World Wildlife Fund