

PROFOR

# WORKING PAPER

## TOOLKIT FOR FOREST CONTROL AND SUPERVISION:

PRACTICAL FIELD GUIDANCE

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MODULE A: TIMBER VERIFICATION AND INSPECTIONS SYSTEMS

MODULE B: GOOD PRACTICE FOR CONTRACTS BETWEEN INDIGENOUS PEOPLES  
COMMUNITIES AND LOGGERS

INTERIM REPORT

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# 1. ABBREVIATIONS

AOP	Annual operational plan
CITES	Convention on International Trade in Endangered Species
DBH	Diameter at breast height
FLEG	Forest law enforcement and governance
GPS	Global positioning system
IP	Indigenous people
ICT	Information and communication technology
ILO	International Labor Organization
REDD	Reducing emissions from deforestation and forest degradation
SFM	Sustainable forest management
UTM	Universal transverse mercator
UAV	Unmanned aerial vehicles

## 2. INTRODUCTION

### 2.1 General Background

Good forest governance is widely recognized as being a key part – even a precondition – for sustainable forest management (SFM). There is no clear consensus on how SFM is to be exactly defined, but its key elements are recognized by all stakeholders<sup>1</sup>. However, irrespective of the definition of SFM, good governance and functioning law enforcement are essential parts of it. Governance has also become one of the key elements in the global forest policy development work.

Good forest governance and effective law enforcement have several dimensions and have become a multi-faceted topic. Some key dimensions include:

- **political will:** forest governance, like all public governance, requires commitment by various stakeholders to improve governance and maintain good or at least good enough, levels of governance. This includes the commitment by the State and its representatives to good governance (supply of good governance) and non-state actors' interest to good governance (demand of good governance);
- **clear and well-designed regulatory framework:** regulatory framework is the foundation for all governance systems; if the 'rules of the game' are unclear or unfair, also their implementation will be unclear and unfair;
- **functioning institutions:** being able to deliver good governance and functioning law enforcement requires that state and non-state institutions involved in forest issues are competent, have clear mandate and terms of reference, are driven by professional ethos and have legitimacy among stakeholder groups;
- **resources:** even well-designed institutions and systems do not function well if they do not have adequate resources for recurrent costs and investments. Maintaining good governance and law enforcement has financing costs as well.

Two World Bank hosted trust funds – Forest Law Enforcement and Governance (FLEG) –trust fund and PROFOR: Program on Forests<sup>2</sup> – supported several field activities on forest governance development in Central America and Peru in 2005–2013. The overall objective of the program was to strengthen local governance systems as well as to collect practical experience on how to improve governance for scaling up and replication. Particular focus was to find ways of building both demand and supply of good governance in resource constrained environments. Therefore the program focused on developing low cost systems which were often based on low-tech solutions and appropriate technology.

Another particular angle was to develop community engagement in environments where ethnicity plays an important role. Indigenous people (IP) with particular social structures, interests, legal role and traditional knowledge and relationship with the forests, are a particular stakeholder group. Solutions that work well for the majority population, often need to be adjusted to serve the needs of the indigenous people. It is unrealistic to assume that 'one size would fit all'.

1. The most widely inter-governmentally agreed-on language on SFM is represented in the non-legally binding instrument (NLBI) on all types of forests of the United Nations Forum on Forests (UNFF): "Sustainable forest management as a dynamic and evolving concept aims to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of present and future generations."

2. The FLEG-TF was operational in from 2005 to 2011 and was financed by a grant from the European Commission. PROFOR is a multidonor trust fund housed in the World Bank since 2002. -For more information on PROFOR, see [www.profor.info](http://www.profor.info).

## 2.2 Structure and objectives of the guidebook

The experiences from the FLEG-TF and PROFOR financed activities were collected in 2014 to produce evidence-based guidance notes for practitioners. The objective was to present and disseminate good and tested low cost practice for field operators. Three particular topics were identified as areas where there is gap in practical guidance and where the Program has been able to produce practical experience. These three themes complement previous publications where Veritas-toolkit (a spreadsheet tool to estimate mahogany conversion factors) was presented<sup>3</sup>. The identified themes were:

- i. **Forest inspections** where logging operations are inspected by authorities to verify legal compliance;
- ii. **Sawmill and log yard inspection** where wood buyers' sites and operations are inspected by authorities to verify legal compliance;
- iii. **Indigenous peoples community and logging company contracting** where there is a notable risk for unfair contracts due to lack of appropriate processes and safeguards.

This project was implemented in close collaboration with Centro Agronómico Tropical de Investigación y Enseñanza (Tropical Agricultural Research and Higher Education Center - CATIE, a forest and rural development institute based in Costa Rica). They collected the experience from the field operations and organized validation workshops with key IP partners to ensure that the guidance on IP-logging company contracts is valid. As a results, two publication came out in March 2015 as CATIE publications in English and Spanish (CATIE 2015).

The fieldwork was done mainly in natural tropical forests with uneven age management systems. While many elements of control and supervision can be applied in all kinds of forests, the forest management system does have an impact on the technical implementation. The same applies to plantations. In forests – both natural and planted – with different management systems the stakeholders may have to adjust the system to better match their specific case. Secondly, verification and control systems naturally depend on national legislation, actual forest ownership structure and who is responsible for management. Despite all these differences, the underlying principles of wood balance calculations and wood flow assessment still apply. The methods and practices presented in this report and CATIE (2015) publication should be seen as examples and general guidance which needs to be adjusted to match with actual conditions.

Control and supervision can only be as good as the overall quality and integrity of the management system and resource governance. As an example, if forest management plans are poorly prepared and timber sales and concession allocations corrupt, there is little control and verification systems can do to rectify the situation. In order to improve forest governance and forest management, it is essential that resource management is both designed and implemented well. One potential approach to assessing the quality of forest governance in general is presented in Kishor and Rosenbaum (2012).

In 2008 the World Bank published the Forests Sourcebook (World Bank 2008) which was a compendium of good practice notes on forestry and the role of forests in global and national development. The guidance notes in this interim publication will be presented in the new edition of the Sourcebook.

This interim publication has been prepared to allow dissemination of the guidance notes until the revised Sourcebook is published and consist of two modules:

- Module A: Timber Verification and Inspections Systems
- Module B: Good Practice for Contracts Between Indigenous Peoples Communities and Loggers

3. Kometter, Roberto and Maravi, Edgar. 2007. and <http://profor.info/node/2109>

# **MODULE A**

## TIMBER VERIFICATION AND INSPECTIONS SYSTEMS

## 3. INTRODUCTION TO TIMBER VERIFICATION AND INSPECTIONS SYSTEMS

Forests are an economic good and a valuable raw material base. However, in many countries timber and roundwood markets suffer from high levels of illegality. This can happen either through illegal logging (timber theft, i.e. totally unauthorized logging in State-owned or private forests, both in production forests and protected areas) or through tax fraud or other underpayment of fees in otherwise authorized logging. Governments lose as much as US\$5 billion annually from evaded taxes and royalties on legally sanctioned logging alone (For a detailed discussion on the nature and extent of illegal logging, see Chapter 1: Improving Forest Governance and associated notes, particularly Note 5.5, of World Bank. 2008.). Illegal logging has also adverse impact on the 1.6 billion people who depend upon forests for part of their livelihoods, and as many as 350 million people living in and around forests are heavily dependent on forests for their livelihoods and security (see Chapter 1, Forests and Poverty Reduction, and associated notes in World Bank. 2008). Moreover, encroachment in protected area boundaries threaten the conservation of forest resources and biodiversity. Illegal logging is one contributor to deforestation and particularly forest degradation. Consequently prevention of illegality is also important for the REDD-agenda<sup>4</sup>.

Illegal logging and underpayment of forest fees<sup>5</sup> can be a result of a lack of forest policy, a failure in the enforcement, or both. Illegality can take many shapes and can happen at different stages of the production chain: award of forest concessions/logging rights, failure to respect forest management plans or annual operation plans, failure to pay correct taxes and fees, failure to comply with social and environmental standards, illegality in processing timber at the mill, among others.

One possible early action to improve law compliance and prevent non-payment of forest fees, is the monitoring and verification of compliance with forest regulations. Forest verification consists of procedures for evaluating legal compliance of forest activities using information from monitoring processes and external observations. In general, forest control and supervision is the responsibility of the national<sup>6</sup> forest authority, and it usually involves verification of forest harvest areas and processing facilities, including field inspections and reviews of documentation and management systems as well as procedures for evaluating this information and coming to a conclusion about the level of actual compliance (Brown et al 2008).

In countries where forest sector institutions are weak, poor performance of government control activities is often attributed to a lack of resources. This can be overcome by participation of different institutions. For instance, in Costa Rica forest administration system involves a combination of state, state-private sector and independent agents. On the other hand, in Ecuador, an innovative outsourced national forest control system delegating responsibility for monitoring and public administration of forest operations to three different agencies – including participation of civil society and private sector – could not be maintained in the long term.

The following sections provide guidance on forest verification and timber inspections at sawmills and timber yards. The first part on forest verification describes a low-cost manual methodology for field inspections in the forests. Field inspections are a key step against illegal logging and related trade as they verify that harvested volumes follow the annual

4. REDD: Reduced (carbon) Emissions from Deforestation and (forest) Degradation.

5. In this Note, 'forest fee' is a generic terms capturing stumpage, royalties, taxes and other payments – public and private – that an operator liable for paying.

6. 'National' may also refer to state- or provincial-level responsibility depending on the structure of forest administration in any given country.



operational plan, they provide information that will be the basis to further verify the legality of the wood processed at the sawmill and they also verify that forest regulations are being respected. The second part on timber inspections helps REDD: Reduced (carbon) Emissions from Deforestation and (forest) Degradation. “closing the loop” of forest control activities by linking the flow of volumes of processed timber through sawmills and lumber yards with the approved and verified timber volumes in the forest. The overall objective is to prevent trade and processing of illegally obtained timber.

The systems defined are low-cost and low-technology options. Recent development in mobile technology, improved access to low-cost earth observation data and even unmanned aerial vehicles (UAV, drones) would allow more high-tech solutions. These are not mutually exclusive options and verification systems can be developed to use more technology as resources and technical knowledge become available (see Text box 1 below).

#### TEXT BOX 1 OPTIONS FOR USING TECHNOLOGY

Recent developments in information and communication technology (ICT) have helped inspection work tremendously; for example, currently nearly ubiquitous smartphones are powerful data collection and storage devices that can help the accuracy and integrity of data collection if using the right software. Using electronic devices for data collection allows both identifying human errors easily and also allows sharing information more freely and very early in the inspection process. If observations are stored and shared early in the process, it becomes much more difficult to temper with data later on, and it becomes much easier identify discrepancies and persistent patterns in the data. Also accurate GPS devices have become increasingly affordable.

The second area where technology can be used is using earth observations to plan forest inspections. Medium resolution earth observation data is freely available and can be used to identify for example high risk areas. This is already more demanding technology than handheld devices in data collection and may require professionals from forest agencies.

It is essential to note that technology is neither a panacea nor a ‘silver bullet’, but it can be used also partially, it can be introduced step-by-step to replace costly and vulnerable stages in an otherwise manual process.

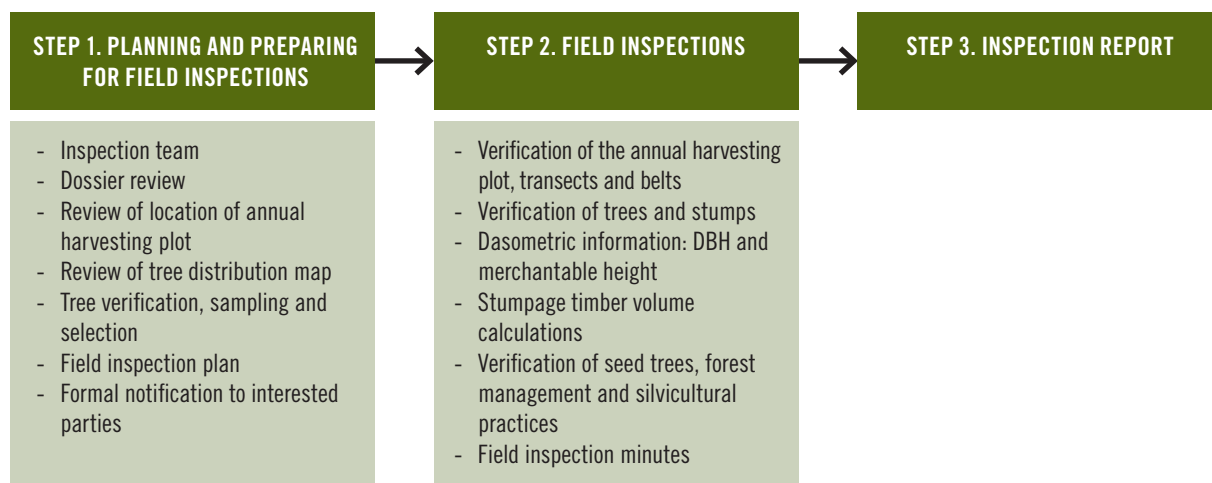
For more discussion on using ICT, see for example World Bank (2013) and Castrén and Pillai (2015).

All inspections can be only as good as the people in charge of them. It is essential that team members all have high professional integrity and do not have direct financial interest in the firms and operations being investigated. The same applies to their family members. It needs to be recognized that in many cases there is a risk for corruption also in the inspection process. Rotating team members helps to avoid undesired collusion among team members. This may be a challenge in areas where there are only a few competent professionals who can be used. Also working methods can help to ensure the integrity of the inspection process: transparency in inspections, using technology to store raw observation immediately before it can be manipulated (see Text box 1 above) and having independent observers can promote credibility of inspections. Transparency at all stages where it is feasible helps to ensure the integrity of inspections and also stakeholders’ perception that the inspections are done professionally and without bias.

## 4. OPERATIONAL ASPECTS: FOREST VERIFICATION

Forest agencies in most countries have established formal procedures for supervising and monitoring management plans and annual operating plans as well as their implementation. Despite these procedures, there remains a need for practical guidance for onsite tasks to conduct reliable field inspections. The procedures presented here aim at assisting forest authorities to ensure the legal origin of timber, based on actual on-site verification of trees in the forests and proper calculations of respective production volumes. The proposed methodology is particularly helpful for agencies with limited technical capacity and budgetary resources that are interested in ensuring timber legality through a checks and balances approach. Figure 3.1 below shows the steps suggested for developing field inspections and specific activities in each one of them.

**FIGURE 4.1 GENERAL STRUCTURE OF FOREST VERIFICATION PROCESS**



### 4.1 Planning and Preparing for Field Inspections

Forest inspections are official law enforcement and forest management supervision procedures. Therefore, it is essential that due diligence is followed and that procedures are transparent and well documented. This ensures both rule of law and that administrative procedures and evidences are admissible in courts.

#### Inspection team and equipment

Before launching field inspections, a Team Leader should be appointed in charge of the Inspection Team. He/She coordinates with other units within the forest administration to organize the Inspection Team and assign responsibilities for team members. The Team Leader has the overall responsibility of the Inspection.

The inspection Team should consist of the following members<sup>7</sup>:

- i. **Team Leader** lead and conduct other preparatory activities, ensuring notification of pending inspections, plan the field inspection and prepare the inspection report;
- ii. **specialist in field inspections** help the Leader in verifying: (i) the existence, location and volumes of trees approved for harvest; (ii) the existence and location of seed trees; and (iii) compliance with all other forest management and silvicultural practices contained in the annual operational plan (AOP);
- iii. **assistant specialist** from the local office of the forest authority;
- iv. **local forest ranger expert** in tree identification (Melendez et al 2006);
- v. other specialists and supporting staff (drivers etc.) from the forest authority, as needed;
- vi. based on national legislation, field verifications may also include participation of representatives from NGOs or other stakeholders.

Basic forestry instruments to perform field verification tasks include:

- compass and maps
- diametric and metric tapes
- GPS
- hypsometer or clinometer
- survey poles, plates and machetes
- camera
- field notebooks and field forms
- copy of AOP document
- forest census and species distribution maps; and
- first aid kit.

## Dossier review

Before launching field activities, the Team should review relevant technical and administrative regulations. It is also suggested that the Team consult with the forest agency's legal advisor in order to make sure all planned procedures are in line with regulations. This is particularly important if rules have changed or there are some other aspects where the inception case differs from past inspections. An important task in planning the field inspection is a thorough review of the existing dossier of the forest operator to ensure full compliance with required documentation.

The dossier review should include copies of the following key documents (INRENA 2007, OSINFOR 2012):

- logging contract, forest license/authorization/permit;
- annual operating plan and forest management plan;
- annual harvest plot location map;
- map of tree species distribution (included in the annual operating plan);
- reports of the past annual operating plan implementation;
- current balances<sup>8</sup> of trees and volumes harvested;
- copies of timber transportation permits (where required);

7. The final composition depends also on the size of the unit to be inspected, and qualifications and experience of individual team members.

8. Carry forward volumes from previous year as regulations allow it in some countries

- wood balances from the previous year (if applicable);
- prior field inspection reports (if applicable);
- other relevant documentation.

## Review of location of annual harvesting plot

Prior to the fieldwork, the Team should ensure that the boundary coordinates for the plot (as provided by the forest manager) match those included in the government's forest information system<sup>9</sup>. This review is particularly important for identifying early on any potential overlap with prior annual harvesting plots or with surrounding forests where logging is not allowed. It also helps the Team in finding the plot in the field. The review will also allow the Team Leader to better plan the field inspection.

## Review of tree distribution map

A map of the annual harvesting plot indicating trees approved for the year's harvest is a product of the mandatory forest census conducted by the operator or the forest manager. The review of the tree distribution map is the key element for *in situ* verification of standing or previously harvested trees and seed trees. A careful review of the annual harvesting map will allow its comparison with previous annual operation plans and implementation reports. It provides the basis for estimating harvest balances, filling out field forms, preparing a list of species and a map of trees to be verified. Elements to be considered in this step are: (i) tree distribution patterns, (ii) topography, (iii) maps and posts and (iv) harvest activity reports.

## Tree verification, sampling and selection

Verifying the trees to be harvested, their volumes and also the seed trees included in the annual operating plan is an essential part of timber traceability. It is also needed for assessing any additional needs in forest law enforcement. Depending on the size of the operating unit, it is recommended that all trees in the census be verified. In particular, species listed under CITES or with high commercial value should be included as they are the most prone to be over-harvested and illegally traded.

Depending on national regulations and the Team's capacity, verification may be limited to a representative sample of all authorized trees included in the annual operating plot. Sample size and tree selection methodology are primarily set by forest regulations. In general, the sample should include at least 25–30 % of the total number of trees proposed for harvesting and should include seed trees. The sample should also be random and not biased e.g. by accessibility. These percentages depend on such factors as forest structure, species composition and levels of harvesting of a given species at the national level. Accepted margin of error of sampling should be below 10%. Tree selection for samples should be distributed throughout the Annual Harvest Plot and particularly within areas of higher tree concentration per species and of a high concentration of species regulated by CITES (OSINFOR 2012). The result of this process is a list and map for tree verification.

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9. If operating area records are not geo-referenced, comparison should be made to whatever system is used. It would be essential that all location information is geo-referenced accurately.

## Field inspection plan

The inspection plan should include timing, tentative duration and schedule for the inspection. These will be defined also by the distance, accessibility, total area of the plot, number and location of trees to be verified, etc. It will also describe tasks, responsibilities, field crew organization and participants. In addition to methodology and logistics, the plan will identify potential obstacles for fieldwork and administrative and operational needs for meeting inspection objectives.

Formal notification to interested parties

Depending on national regulations, the Team Leader or other authorized officer will issue a notice for the field inspection to the forest manager indicating the date of the inspection and a request for participation.<sup>10</sup>

Notification will be sent to the legal residence of the forest manager or logging operator and should allow adequate time for necessary preparations by the recipient. In some cases, notifications should be mailed registered and certified by a notary. If allowed by local regulations, the forest manager may appoint his/her representative to participate in the inspection. Additionally, an invitation for a formal working meeting with the Inspection Team will be issued with the notification to discuss the plan for fieldwork. Official notification may also be made public in appropriate local media.

## 4.2 Field Inspection

Forest inspections can be expensive and time consuming. In tropical countries they can often be carried out only during the dry season. Therefore, it is essential that inspections are well planned. To increase quality of field inspections, it would be helpful to use photos, videos and other technical devices to collect supportive material.

### Verification of annual harvest plot vertices, transects and belts

Verification tasks and data to be completed should follow the same procedures as those used in the forest census. In general, activities in the plot include verification of the annual harvest plot's geo-referenced vertices, main transect line, belts and rows, standing trees, stumps and cut trees or logs around stumps. The inspection process also includes verification of forest roads, skid trails and other relevant structures within the plot.

An important initial activity is to identify and mark vertices and boundaries of the annual harvest plot based on the coordinates presented in the annual operating plan (INRENA 2007). In the event that vertices and other census work have not been done, the team should take note for the technical report and, based on regulations, decide whether the fieldwork should continue.

Using the tree distribution maps, tasks include opening trails to establish geo-referenced transect lines and census belts with markings and numbering, following guidelines for a forest census.

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10. This is the case when inspection is part of regular monitoring. Investigation of ongoing or past illegal activity follows the procedures of any criminal investigation.

## Verification of trees and stumps

The most important task of the Team is the identification and verification of all trees established by the forest census and included in the tree verification map. According to the UTM coordinates on the map, trees will be verified by checking marks and codes and comparing them with those on the map. Variation of distances of coordinates for a given tree should be within a radius of about 10 m.<sup>11</sup> For differences beyond 50 m., the annual operating plan, field notebooks and census methodology should be checked carefully in order to identify inconsistencies. Another tree in the same census belt may be verified to re-confirm geo-referencing and make needed adjustments (OSINFOR 2012). The general rule is that if a tree is not found beyond 50 m. of given coordinates it should be reported as not found. In case plates or markings are not visible in a given tree, new plates and markings should be posted following the census code. All re-marking information needs to be recorded in the inspection minutes. The local forest ranger expert in tree identification should assist this activity.

The following information should be registered for each of the trees verified:

- UTM coordinates;
- common and scientific name;
- classification as harvestable or seed tree;
- tree identification marking and code based on census;
- census belt number locations;
- diameter at breast height;
- merchantable height;
- other relevant observations and comments.

All of this information should be similar to the forest census in the annual operating plan. It would be helpful to prepare tables or another format to compare both sets of information.

In the case of felled trees around stumps, the coordinates, markings and codes should match with tree data on the forest manager's map: dasometric data should be verified as described in the section below. When only the stump is found, its diameter should be measured (Global Witness, INAFOR 2008) following the method detailed below. In the case of logs already moved to a landing area, verification can continue in those areas by checking markings and codes on logs and comparing them with those on the map.

## Dasometric information: DBH and merchantable height

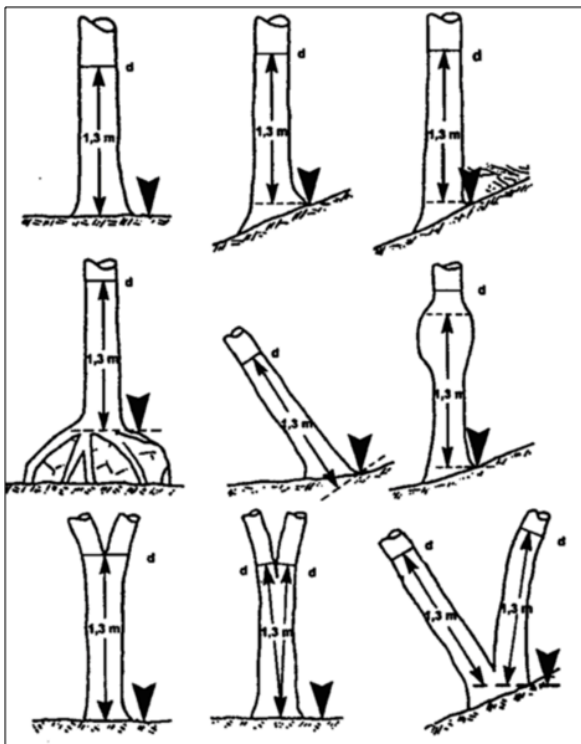
Obtaining dasometric data from each of the harvesting trees is important for verifying proposed volumes in the annual operating plans and is a key task that allows the establishment of the baseline for successful forest control and supervision.

Diameter at breast height (DBH) is used to calculate the volume of standing trees using the national or other appropriate volume conversion table. DBH measurement is measured at 1.30 m. from the bottom of the tree. Its measure varies according to the characteristic of the tree and the terrain as shown in Figure 3.2 below.

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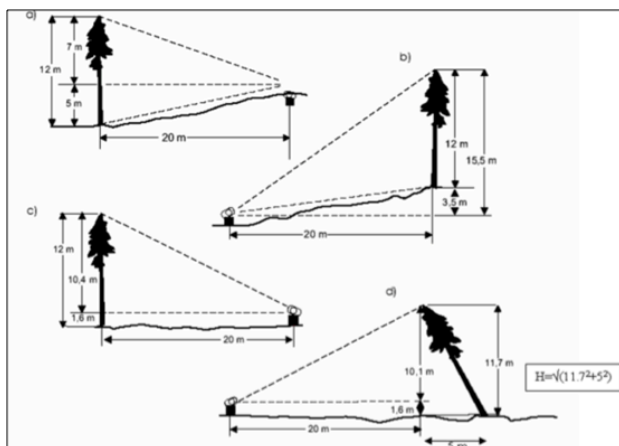
11. Modern GPS devices provide much higher accuracy and should be used. The cost of technology has declined in the past years making even consumer grade devices accessible yet highly reliable. On accuracy of GPS, see e.g. <http://www.gps.gov/systems/gps/performance/accuracy/>.

**FIGURE 4.2 MEASUREMENT OF DBH**



In the absence of national conversion tables to calculate volume from the DBH, the merchantable height is necessary for the calculation. The merchantable height is the vertical distance between the level of the stump (0.25–0.30 m.) and the first major branch of the tree trunk (CONAP - INAB 2004). The measurement of the height depends mainly on the characteristic of the terrain as illustrated in Figure 3.3 below. There are also other instruments available to measure the merchantable height with low margin of error, among them the hypsometer and the clinometer.

**FIGURE 4.3 MEASURE OF TREE HEIGHT ON DIFFERENT TERRAINS**



## Stumpage timber volume calculations

In most cases and for most practical purposes, the merchantable volume is the same as the approved harvesting volume. The merchantable volume is measured only for trees authorized in the annual operating plan and whose DBH is equal or greater than the minimum commercial diameter established by forest authority for that species. The formula to calculate the volume is presented in Formula 1 below.

### FORMULA 1 MERCHANTABLE VOLUME

**Merchantable volume (stumpage volume/standing timber) = BA x MH x ff (0.65)**

MV= Total merchantable volume (m<sup>3</sup>)

BA = Basal area (m<sup>2</sup>) =  $(\pi/4) \times \text{DBH}^2 = 3.1416/4 \times \text{DBH}^2$

MH = Merchantable height (m)

ff = Form factor 0.65 (recommended for tropical trees)

(CADER 2012)

Measuring tree height in the forest can be complicated and time consuming given the ground conditions and vegetation. Therefore, creation of *National Volume Conversion Tables* for each species is highly recommended. Other practical method is the use of the *VERITAS Timber Calculator*. This is a practical tool to help forest authority officials in recording data and calculating timber volumes resulting from the verification of trees by using a conversion factor based on national yield table volume and the DBH of trees<sup>12</sup>.

In case felled trees are left by the stump, the Team should verify markings and codes, and take diameter measurements of both the larger and smaller ends of the tree trunk. The diameter dimensions include measuring two cross sectional diameters and the merchantable height (OSINFOR 2012). Volume is calculated using the formula above. The Team should also assess if the felled timber is only waiting for transportation or if it is logging damage.

When the only evidence of a tree in the forest is the stump, it is necessary to use the stump's diameter as the only dimension (McClure, 1968). The volume is calculated using local volumetric tables if available (Bylin, 1982b). In their absence and when in the field, a practical procedure is to compare diameter dimensions at the stump height with the DBH of a living standing trees in the annual harvest plot. In order to increase accuracy of this prediction, estimated volumes should be compared with data included in the annual operating plan for those particular trees.

## Verification of seed trees, forest management and silvicultural practices

Assessing the status of seed trees is as important as monitoring trees to be harvested and their volumes. In most countries, regulations and guidelines provide specific variables for assessing seed tree conditions:

- classification of seed trees into an appropriate strata: i) superior or dominant; ii) medium or co-dominant strata; and iii) inferior or sub-dominant. This is done based on height, position and the vigor of their crown compared with other standing trees;

12. VERITAS Timber calculator is available in: <http://profor.info/node/2109>



- crown shapes and position of seed trees: i) circular crown; ii) circular irregular; iii) half circular; iv) less than half circular; and v) only some branches;
- crown exposure to sunlight: i) total exposure; ii) plenty superior exposure; iii) some superior exposure; iv) lateral sunlight or v) no sunlight exposure;
- relationship of the tree trunk and crown and degree of infestation by lianas and other aerial plants: i) free of presence on the trunk; ii) some presence on the trunk and crown, and iii) notable presence in trunk and crown affecting tree growth;
- tree trunk shape and structure: i) high, ii) medium, and iii) low quality;
- phytosanitary conditions of the seed tree measuring damage caused by fungi, insect or other pests: i) no attacks; ii) attacks in one third of the trunk; iii) attacks in two thirds of the trunk, and iv) attack on more than two thirds of the trunk (OSINFOR 2012).

Team's complete field inspection also focuses on verification of silvicultural practices described in the Forest Management Plan and annual operating plan. Particularly important is verification of compliance with mandatory practices for proper demarcation of the annual harvest plot, forest census design, and identifying and marking/tagging trees to be harvested and seed trees according to protocols. Verification includes assessment of the forest manager's compliance with practices related to natural regeneration, protection of freshwater in streams and lagoons, and prevention of soil degradation resulting from logging (incl. skidding trails and roads).

In cases where harvesting activities have already taken place, verification focuses on compliance with maintaining the productive capacity of remaining forests and protection of high conservation value forests. Special attention should be paid to verify the quality of practices for maintaining tree density, phytosanitary quality and crown cover, as well as the quality and extent of thinning practices. The inspection will also assess if past operations have followed agreed practice. Assessing felling, topping, de-branching and bucking techniques; skidding practices, road construction and log landing areas construction as well as management of solid waste and debris is also important.

Finally, the inspection verifies the balance of approved harvesting volumes and the actual harvested volumes by cross-checking existing documentation and estimated volumes calculated based on verified stumps.

## Field inspection minutes and Inspection report

Field inspection minutes need to be prepared based on the formats and guidelines developed by forest authorities. Minutes need to describe all tasks implemented, findings and observations from fieldwork. Minutes for each day of the inspection should be prepared and signed by all involved parties, particularly the Team Leader, the forest manager and participant witness (usually a local authority or agency).

The field inspection closing minutes describe all tasks and findings resulting from the inspection process. Since minutes are official documents they should include all appropriate information, raw data and detailed findings and observations. If there were any alleged violations of legislation or contractual responsibilities, these should be recorded in pictures with GPS coordinates attached.

In order to complete the inspection process, the Team Leader will be responsible for preparing the overall report of the field inspection. The structure of an inspection report consists of:

- Date and official report number, according to the filing system of forest authority;
- Name of Team Leader and responsible forest official ;
- Subject: Code number of AOP/Contract/Authorization/Permit and Name of Forest Holder;
- AHP location, UTM coordinates vertices;
- Objective of field inspection;
- Background;
- Tasks description and analysis;
- Findings and observations related to verification of AOP;
- Results, conclusions and recommendations;
- Date of signature;
- Team Leader name and list of team members.

Once the report is completed, it will be submitted to forest authorities for technical evaluation and appropriate follow-up action. The authorities will verify the proper implementation of the AOP and Forest Management Plan by the forest owner as well as the inspection itself. If evaluation results are favorable and no further action is needed, the forest manager will be formally informed, and the case is filed. In the case irregularities or any violation of forest regulation are found, a separate technical report is helpful to describe such findings. The additional report should gather evidence for the case (maps, pictures, geo-referenced data, stumps, witness deposition, volume data, and proof of official documentation misuse). This would be followed by appropriate enforcement action.

## 5. OPERATIONAL ASPECTS: TIMBER INSPECTION AT THE SAWMILL AND LUMBER YARDS

Sawmill inspections are administrative procedures performed by forest authorities with the purpose of preventing laundering of illegally harvested and traded timber in sawmills, other processing mills and log yards. Inspections are official activities to enforce law, and it is essential that due diligence is followed and that procedures are transparent and well documented.

This section presents a set of procedures for officers and technical staff from forest authorities or institutions to implement inspections of timber flows at sawmills and lumber yards. It shows simple, low-tech procedures for planning and implementing activities to monitor existing and traded volumes of roundwood and processed timber. Inspections need to be based on the volumes of verified timber in the forest selected for harvesting according to forest permits. While inspections are important for law enforcement, data obtained through inspections can provide inputs also for forest industry business plans, could be used in verifying chain of custody for “controlled wood” and in the stepwise approach for forest certification.<sup>13</sup>

### 5.1 Preparing the inspection plan

In most countries, the national forest information system or official records provide information on the number of trees and their respective volumes approved in Annual Operating Plans (AOP). Based on this information, inspections can be used to cross-check the approved volume in the forest with those of roundwood supplied to sawmills<sup>14</sup> and lumber yards. One important element of the inspection process is the use of volumetric yield rates that need to be calculated according to countries' regulatory frameworks.

Inspections require coordinated team work. Assignment of tasks and responsibilities needs to be based on the inspection plan to be prepared before the inspection can be carried out. Staff needs and distribution of work will depend on the size of the facility, the information needed and planned tasks. Priority will be given to such tasks as timber flow information, specifically collecting and verifying information on roundwood volumes and timber grades. Key tasks also include verification of roundwood, sawnwood and analysis of documents regarding timber traded. If the inspected facility is a lumber yard, priority will be on verifying inventories and analyzing documentation.

13. This guideline includes significant input from the *Forest Industry Control and Supervision Pilot Program* in Guatemala. The program was conducted by the Guatemalan Forest Authority (Instituto Nacional de Bosques, INAB) and CATIE (Centro Agronómico Tropical de Investigación y Enseñanza) with support from PROFOR – The World Bank Group.

14. Or other processing units. In this note, “sawmill” includes also wood-based panel factories and other primary processing units.

## Forest industry licenses and registration

In many countries, legislation regulates the registration and operations of forest industries, including sawmills, lumber yards and other processing. A quick census of all operating businesses and lumber yards in a given jurisdiction will help to identify the appropriate areas for monitoring timber flows and processing activities. It also offers an opportunity to improve law enforcement by supporting administrative and judiciary authorities to identify illegal logging and related trade in facilities operating outside the law. With this data, forest authorities will be able to achieve either legalization or closure of facilities operating illegally (INAB 2011a).

## Geographic location and mapping

The above mentioned data should provide geo-referenced information of the location of sawmills and lumber yards. This will facilitate the preparation of maps for identifying the geographical distribution of timber processing activities, location of industrial and trade infrastructure and the geographic flows of timber products throughout the country. Maps will also provide the basis for planning and carrying out inspections (INAB 2011a). Electronic maps also allow overlaying different data sets and help also in identification of risks (e.g. concentration on processing plants in proximity of well-stocked protected or indigenous peoples' areas could indicate a high risk of illegal logging). This helps also in verifying the origin of timber.

## Preparations for the Inspection

The Unit responsible for inspections within the forest authority at the national and provincial levels should have access to all relevant official data and registration files of all sawmills and lumber yards under its jurisdiction. This dossier should include the registration certificate of each facility, standard reports and other relevant documents related to business operations. These will differ from one country and industry to another. It would be essential that national authorities establish a standard set of required documentation. Registration documents and other information should be filed in an accessible manner within the responsible agency (INAB et al 2011b). One option would be to establish a national online database for authorized wood industry operators.

Based on the above preparatory tasks and before launching the field inspection, the Unit must develop an inspection plan. A preliminary plan will be prepared based on available information from sawmill or lumber yard, including background information (company owners or legal representatives, other interested parties, location, estimated processing volume, reports, plant capacity, etc.), objectives, team composition, estimated time required for field work, major tasks and logistical arrangements (INAB 2011a). The national authorities could establish a template for an inspection plan. This would allow creating case specific plans with a marginal effort.

For regular inspections it may be necessary to give a reasonable advance notice to ensure that key people are present. However, if illegal activity is suspected, it is necessary to maintain all preparations confidential and not to give advance notice.

For the inspection, an Inspection Team should be established. The team should be led by a Team Leader who will interact with industry as the formal agency representative throughout the inspection process. The Team Leader will determine the number of team members and will coordinate responsibilities, assignments and tasks. The Team will seek support from the forest authority's local agency and other authorities as needed.

Required time for an inspection will depend on the size, processing capacity and organizational structure of each sawmill or lumber yard and on the volume of timber, inventory and the complexity of supply chains. Inspection time will also vary given the number of team members available to conduct such intensive tasks as inventories, detailed review of documentation and journals, and report preparation.

## 5.2 Implementing the inspection plan

Once at the facility, team members should have their photo ID visible all the time, and the team should have the documentation related to their appointment readily available. Before starting any activity, the Team Leader is responsible for:

- i. Informing the owner or legal representative the objective of the inspection;
- ii. Presenting all Inspection Team members and their respective credentials;
- iii. Delivering a copy of the inspection notice;
- iv. Taking a quick walk through the facilities and offices to make preliminary observations;
- v. Reviewing the inspection plan with the company staff; and
- vi. Requesting company staff needed to assist during inspection tasks. Participation of company staff is important to witness the inspection process and to provide information.

The Team is expected to carefully review the company's legal documents including:

- i. Registration certificate;
- ii. Journals and ledgers of timber movements (supplied roundwood and processed sawnwood) approved by the forest authority, complementary digital baseline data, documents related to stock or inventories, etc.;
- iii. Documents that demonstrate the origin of forest products (forest transportation permits, forest permits/licenses, purchase orders, invoices, receipts of payments, etc.); and
- iv. Journals and ledgers tracking volumes of processed wood by species and grades. Documents should also include any timber processed by or for third parties through service contracts. Particular attention should be paid to verify the authenticity of the documents<sup>15</sup>.

In cases in which the company intentionally refuses to provide the proper documentation, the Team will take note in the inspection minutes in order to allow for further administrative or legal procedures according to the law and regulations of the respective country. This may also require the assistance of law enforcement to secure evidence.

### Verification of roundwood and sawnwood

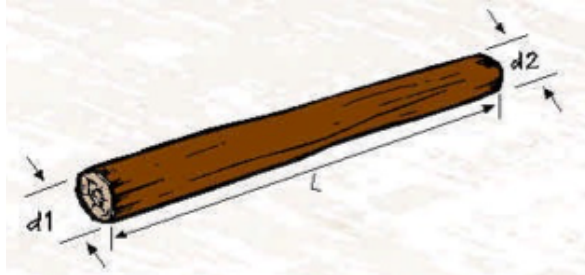
The verification of inventories in sawmill log yards includes measuring roundwood (logs, flitches, etc.) and sawnwood (see Figure 4.1). The verification also involves measuring inventories of sawnwood per species and grades.

15. This includes "recycling" of documents, i.e. using one permit several times. This, however, is partly beyond the realm of a single inspection if the system is poorly designed.

## FIGURE 5.1 VOLUME MEASUREMENT FOR DIFFERENT TIMBER PRODUCTS

### MEASUREMENT OF ROUNDWOOD OR LOGS

Smalian formula:  $V = D^2 \times L \times 0.7854$



(Source: Mancilla 2003)

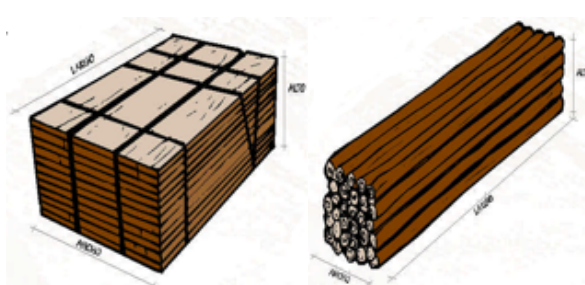
$V =$  Log volume ( $m^3$ )

$D =$  Average log diameter (m) =  $(d1 + d2)/4$

$L =$  Log length (m)

0.7854 = Resulting factor  $3.1416/4$  ( $\pi/4$ )

### MEASUREMENT OF BUNDLED SAWWOOD



$V =$  Width(m) x Length(m) x Height(m) x 0.80

0.80 = conventional bundling factor to discount gaps

All the boards have to have the same dimensions. If the bundle is of plywood, the formula is without the 0.80.

In case of a bundle of roundwood, the factor is replaced by 0.75.

### MEASUREMENT OF PILE OF WOOD



$V = \pi/3 \times r^2 \times h \times 0.624$

$\pi = 3.14$

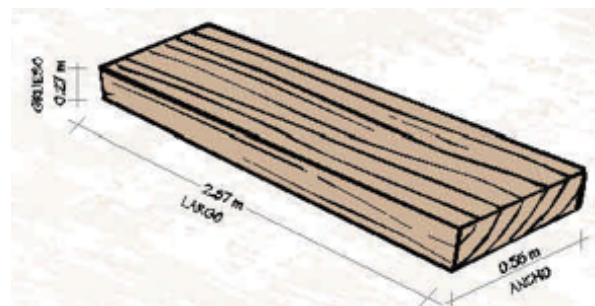
$V =$  volume in  $m^3$

$R =$  radius in m

$H =$  height in m

Stacking adjustment factor = 0.624

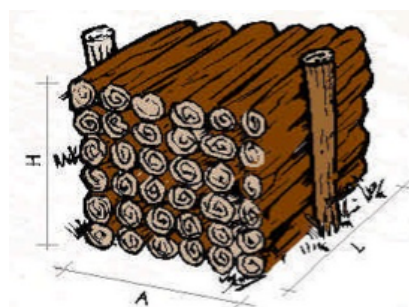
### MEASUREMENT OF BOARDS



$V =$  Thickness (m) x Width (m) x Length (m)

This formula is also applicable for squared/planked timber or flitches.

### FIREWOOD MEASUREMENT



$V =$  Width(m) x Length(m) x Height(m) x 0.78

0.78 = conventional bundling factor to discount gaps

For smaller sticks, the factor should be replaced for 0.5.

### CHARCOAL MEASUREMENT

Charcoal is loaded for transportation or storage in different ways. Containers are various types of nets, sacks, wooden boxes, etc. If nets are used, volume calculation can be completed by using the dimensions of width, length and height multiplied by a stacking adjustment factor of 0.5, following a formula similar to that for small stick firewood:

$V =$  Width (m) x Length (m) x Height (m) x 0.5

Also, a cubic meter of charcoal is equivalent to 43 wooden boxes measuring 0.35 m width x 0.35 m height and 0.5 m length.

## Volume credits, debits and balances

Comparing actual or observed volumes of roundwood and sawnwood with the volumes that should be in stock according to the formal paperwork from the forest authority will provide an overview of the company's legal compliance. In cases of significant inconsistencies in volumes or other evidences of violations, the Team might decide to immobilize relevant timber products following the relevant regulations and make a note to be included in the inspection minutes. Based on the relative size of the discrepancy, the team should decide whether to terminate the inspection and engage with law enforcement authorities or not.

National volumetric yields or volumetric conversion factors estimate roundwood consumption based on the outputs of wood products. If this information is missing, the team could do an onsite study of the sawmill under inspection. If the facility has different types of sawmilling machines, yield calculations will be completed for each of the machines. Text box 2 below describes steps for doing an onsite study.

### TEXT BOX 2 ONSITE STUDY TO DETERMINE CONVERSION OF ROUNDWOOD TO WOOD PRODUCTS

1. Selection and marking of the logs. Randomly select a representative number of logs of all existing species in the log yard following a sampling method. A suggested sample should cover approximately 20% of the total number of logs per species.
2. Data entry per log. All data should be recorded in an appropriate format. An example is provided below.

LOG Code	ROUNDWOOD Volume (m3)	Sawnwood			YIELD RATIO (%) (Roundwood/sawnwood x 100)
		Grade	# boards	Volume (m3)	
		FAS			
		F1F			
		Select			
		1 Common			
		2 Common			
		3A Common			
		3 B Common			
Sub total					

3. Sawmilling, grading and measuring. If the yield calculation includes grading, as soon as the log is sawn the resulting boards should be graded and measured by the Team. For hardwood such as *Swietenia macrophylla*, grading should follow the National Hardwood Lumber Association (NHLA) guidelines. In the case of softwood species, grading should be completed following the particular grading system used in each country (Kometter, Maravi 2007).

## 5.3 Cross checking timber flows

Based on the proposed procedures, the Team can obtain – already during the inspection – preliminary findings by cross-referencing existing roundwood and resulting sawnwood volumes in sawmill with the available documents (official transportation permits, forest permits, etc.) that support the origin of the timber products. The information should be able to provide the total numbers of trees and their volumes from each approved and verified AOP. The following table is an example of a spreadsheet to facilitate calculation.

**FIGURE 5.3 SAMPLE SPREADSHEET**

Number	Permit Transportation Number	Name Approved AOP	Number Approved Trees/species	Previous Balance*	Yield Factors	Previous Reports Balances	Incoming-outgoing volumes sawn & roundwood species / grades
1							
2							
3							
10							
TOTAL							

\* if applicable

In order to secure accurate volumes, cross-referencing is important and should consider the following aspects:

- i. Entries in sawmill journals need to be updated and matched with official documents on roundwood supplied to the mill. Depending on the country's regulations, the incoming roundwood shipments need to have their respective transportation permits or licenses. All of the official documents and journals/ledgers should be handed over to the Team for the analysis.
- ii. In the case of any document, such as transportation permits, already used and canceled (depending on country regulations), the Team should verify that both the original and copies are in files.
- iii. The journals, ledgers, books and documentation need to be in the facilities at all times.
- iv. Cross-outs, deletions and alterations in journals and on official documents are considered faults unless there is a valid justification.
- v. Roundwood entering sawmill for processing should be entered in the journal, supported by official documentation on origin of the timber (AOP, contract, etc.)
- vi. In the case of CITES-listed species, the Team should pay greater attention to reviewing data and documentation and verifying volumes. Any inconsistencies should be reported to national CITES authorities. Same particular due diligence should be used on other species in high commercial demand.
- vii. Inspection teams should take into account the statistical margins of error or tolerance in the verification of volumes, and the yield ratios allowed by the regulations.
- viii. Timber processed in a sawmill, but allowed to be harvested for family consumption, needs official permits and a clearly marked notification designating that it is not for commercial purposes (INAB et al 2011b).



## 5.4 Completing the inspection and reporting

Once the initial inspection is completed and while still onsite, the Team will prepare detailed administrative minutes to make sure all findings, observations, occurrences, tasks and outcomes are registered. Minutes should be prepared using approved forms and signed by all parties involved in the inspection. If the facility is found to be in full compliance, the Team will prepare administrative minutes, providing a copy for the company. In case of inconsistencies, offenses or faults, the Team will follow procedures according to appropriate regulations. Involved products should be, as appropriate, re-measured and marked, listed, photographed, described in a detailed inventory by the Team and included in the minutes. Finally it should be secured until final decisions have been made. In many countries, legislation allows officers to confiscate products to be further evaluated until administrative or criminal processes are completed.

The final task for the Team is the preparation of an inspection report detailing findings, results, conclusions recommendations, inconsistencies, faults and offenses clearly and appropriately. The report describes and analyzes the situation of the company's control systems, books, journals, ledgers documenting operations of sawmill or lumber yard related to timber flows. In the case of faults, inconsistencies, etc., the report should be sufficiently descriptive to present clear findings so that relevant administrative or judicial procedures could be completed without additional information.

Considering local regulations, the suggested format for the inspection report is:

- i. Document code number and date;
- ii. Name and signature of the Team Leader;
- iii. List of Team members;
- iv. Code number of formal assignment of the inspection;
- v. Name of the interested party (sawmill or lumber yard owner/ representative);
- vi. Location of the business;
- vii. Background and inspection objectives;
- viii. Results of the inspection;
- ix. Responsible parties for findings and any further implications resulting from their inspection;
- x. Conclusions and recommendations; and
- xi. Annexes and photographs.

## 5.5 Observations, violations and offenses

If inconsistencies, violations and offenses have been documented, the relevant authority notifies the company to respond to findings, provide clarifications and additional information within the time frame established by law. If responses and clarifications are not submitted or not valid, the relevant authority will process the charges based on relevant legal regulations.

In the case of possible criminal offenses, the forest authority needs to hand over the case to the corresponding law enforcement or judicial agency for potential indictment as prescribed in appropriate regulations. A copy of the case file should be provided to the legal unit of the forest administration and to other agencies as established by law. Once the criminal case is defined by the judiciary system, the company will be sanctioned by the relevant authority (CONADEH 2012).

## 6. LESSONS LEARNED AND RECOMMENDATIONS FOR PRACTITIONERS

Verification activities in the field are important as a first step in controlling illegal logging. However for the control to be effective, it has to cover different activities along the whole production chain from forest to final product including transportation and processing.

Experiences from countries such as Nicaragua and Costa Rica give some lessons learnt from their forests control systems. Some of the key findings are:

- (a) Some forest monitoring systems have a specialist whose task is to verify proper implementation of management plans. If this kind of monitoring system is established, it should be financially independent. If the position is financed by e.g. the logging operator, it easily leads to a conflict of interest or at least a perception of a conflict. The monitoring system should also include an external monitoring of their job.
- (b) Some parts of the forest control system can be delegated to local institutions. This requires appropriate skills and resources and in some cases local participation has been inadequate due to a lack of economic resources. Better involvement of local institutions would make them more accountable for their resources and would improve the proper verification of timber activities.
- (c) For timber verification to be effective along the whole production chain, a cross-checked system should be in place. The system should have information on timber activities such as allowed volumes harvested by species, timber harvested, transport permits emitted, timber processed at the sawmill or stored at the timber yard, etc. Information should be complete and available for all the institutions involved in timber activities. This will improve transparency and will facilitate the verification process.
- (d) Recent developments in information and communication technology makes building this kind of monitoring systems cost-efficient and possible even with modest technical knowledge. Increased use of digital information makes cross-referencing, data verification and its storage more cost efficient and tamperproof.
- (e) In some countries, a lack of clarity regarding what is legal and what is not has caused mismanagement of the resources. However, this includes also several species which are not endangered. Overall, there is a need to have clear and well-justified regulation. This provides proper incentives and predictability which all promote compliance.
- (f) Participation of police and other law enforcement bodies is important to enforce existing regulation and to ensure a professional approach to handling criminal cases. It would also give a strong message stating that forest crime is a serious offense, not only an administrative infraction. Also, active participation of local institutions is desirable; however, it is advisable to do a proper assessment of their job. It is not unknown that in small towns close acquaintances work for the same process but for different institutions. This may create a conflict of interest that can be avoided by including in the verification system external observers.

### TEXT BOX 3 SOME RED FLAGS IN INSPECTIONS

Irregularities in both forest and mill operations come in many different sizes and shapes. It is also essential that the inspection teams are able to read indicative signs of inappropriate actions. Some potential “red flags” are listed below. It needs to be noted that these are not necessarily infractions themselves, but merit special attention by the inspection team. Also, illegality may happen even if these flags are not raised:

- Information is not readily available, is not shared and overall information management is weaker than one would expect from a seriously run timber business;
- Unexpected and unexplained fluctuations in production volumes, product assortments or other business activity;
- Firms which have no prior experience in the sector suddenly have notable operations in the forest sector;
- Engagement of political decision makers, public officials or their close family members in business operations;
- Obvious mismatch between the lifestyle of business owners, firm facilities (incl. investments) and the recorded business operations;
- Surprisingly irrational business decisions (illegality can be hidden by “bad business decisions”);
- Unavailability of key decision makers to Inspection Teams; or
- Attempts to bribe or mislead the Inspection Team.

**MODULE B:**  
GOOD PRACTICE FOR  
CONTRACTS BETWEEN  
INDIGENOUS PEOPLES  
COMMUNITIES AND  
LOGGERS

## 7. INTRODUCTION TO INDIGENOUS PEOPLES COMMUNITIES AND TIMBER BUYERS

It is estimated that 60 million indigenous people (IP) are totally dependent on forests and 350 million people are highly forest dependent. In many countries, the largest forest users of pristine forests are indigenous people. Often the forestlands they use contain valuable timber stocks. IP land rights are being increasingly recognized in many countries, and they have more autonomy over the use of their resources. This has led to an increase in timber and logging rights trading between IP and loggers. This note provides guidance on how to negotiate good contracts and avoid unfair benefit sharing practices, over harvesting and timber theft.

Since the late 1970s, there has been a tendency to give communities some level of autonomy and rights to manage their land. By 2010, it was estimated that over a quarter of forests (27%) in developing countries were owned by or assigned to communities (Larson 2010). The area under some level of control by communities is expected to increase as their rights are legally recognized. The World Bank has supported several projects on land titling to indigenous communities such as one in Nicaragua where 15 indigenous territories were titled, benefiting more than 120 indigenous communities. Currently, the World Bank is supporting land titling to IPs for example in Honduras.

The increased commercial transactions have also led to concerns on community rights to land. This is exemplified by the International Labor Organization (ILO) Convention 169. The convention recognizes the way of life of indigenous and tribal peoples, the need to safeguard their customary rights to land and natural resources, and the importance of giving them an equal benefit from economic and social development. It also supports their active participation in the planning and implementation of development projects that affect them.

With the legal recognition of IP's land rights, communities have also gained more autonomy to use their natural resources. Their traditional use of natural resources has mainly satisfied their basic subsistence needs and they generally do not have the technological capacity and knowledge to extract forest products for commercial use.

The IPs do not have to do this alone. State authorities (e.g. forest or local authorities or special agencies dealing with IP issues) should be able to provide support services particularly if communities are not experienced in dealing with commercial forestry. It would be essential that these stay as *support* services and do not undermine communities' rights and decision making. The authorities should assist the communities in making informed choices. Particularly in cases where communities have only recently been transferred management rights, authorities should be particularly concerned to avoid the perception that they are still in charge. One option is to use well-established civil society organizations as support agents financed by the State.

Some communities have received training in timber production. This training has often consisted of using and selling their timber. More advanced communities have succeeded in establishing enterprises that harvest and process their wood. Communities with low capacity usually sell their timber to logging companies through logging rights (standing timber). However, the lack of knowledge from IPs on businesses have in cases resulted in unfair contracts that negatively affect communities. Fraudulent use of these contracts has also enabled laundering illegally harvested timber – even CITES listed species – also from protected areas. These environmentally unsound activities can have a severe impact on the economy and resilience of indigenous peoples' households and communities.

This note presents elements to be taken into account by communities when negotiating logging contracts with middlemen and logging industry, as well as in monitoring their implementation. The objective should be to improve contracts for the benefit of indigenous and local communities, while preventing illegal logging and forest degradation.

## 8. OPERATIONAL ASPECTS

When starting a process of signing a logging contract between the community and a logging company, there are several elements to consider at various stages of the process. An active and informed participation of the community is important for the agreement to be transparent and deliver socio-economic and environmental benefits. Guidance presented in this section is divided into three categories that reflect activities that communities should apply and assess in the process of signing a logging contract. The categories are: 1. Preparations 2. Contract and Agreement and 3. Implementation.

### 8.1 Preparations

Indigenous peoples have strong ancestral cultural and traditional ties to forests that are very different from other mainstream societies and communities. In addition, forests provide food, medicine, water and many non-timber forest products that contribute to their well-being. For all these reasons, communities should be well-informed on the use of their forest.

Before signing the contract, communities should:

- i. Make sure that the decision to use their forests is made by the community under their free, prior and informed consent. The community's active participation is important to guarantee a transparent process and to assure that their rights are being respected. Decision making should involve community members widely, and elite capture within the community needs to be prevented.
- ii. Have a clear understanding of the activities that the logging company will do. This will help communities identify their potential risks. If the risks are clearly identified, it is easier for communities to control and manage them and to make sure the contract contains preventive actions to avoid them. For example, the community can include in the contract a clause that defines an extra fine to pay if the company harvests a tree that was not selected for harvesting.
- iii. Be informed of the national and international regulation that recognizes their rights, in this way they can make sure the contract follows the regulation. Contracts should always respect national and international laws or agreements. It should also consider existing forestry law and the internal community regulation.
- iv. Build alliances with other, more experienced communities and organizations (e.g. NGOs) that can assist them with: (i) preparing and complying with management plans, operational plans and forest permits; (ii) report back to community members on timber prices, logging costs and timber transportation costs; (iii) training in volume calculation, valuation of timber to get better prices from buyers; (iv) training in sawmilling, marketing and fair benefit sharing at the community level; (v) calculate all the cost and make sure the price the community gets is fair (see Table 1 for a list of the costs to be included in the calculation); among other things. This is essential to secure the sustainability of the resources and for the community to develop its capacities and improve the sustainability of their activities.

**TABLE 1 COST CATEGORIES TO BE INCLUDED IN FINANCIAL PLANNING**

- Travel costs
- Cost of management plan
- Forest permit costs
- Forest roads & log yard cost
- Harvest preparation & felling
- Log cutting and preparation costs
- Transportation cost
- Marketing cost

- v. Based on cost calculations and collecting market information, obtain an accurate and realistic understanding on fair market prices. It is essential to note, that stumpage and road side prices are not the same and depend on many factors, e.g. species, timber assortments and quality, accessibility and distance to markets etc. Therefore, it is essential that market information is collected widely.
- vi. Improve organization capacities. The community should elect a Community Timber Committee – or use another inclusive elected body – to enforce law compliance by the community and the loggers. The committee should be elected by the members of the community and should hold accountable for the well-being of all community members (incl. gender and intergenerational considerations). In order to secure transparency and legality, leaders should obtain wide support from the community assembly before beginning any process for management plans, AOP preparation and forest permit requests. Only in this way will all related activities be fully legitimate.
- vii. Make sure the timber sales benefit the community as a whole. Community development activities are often better than individual cash distribution as cash often causes internal conflicts. Based on its bylaws, the community assembly should make the final decision about how benefits would be used and distributed. The decision and criteria need to be transparent and recorded for future reference. It is important that only net revenue is allocated to community members and, for example, activities included in the forest management plan are covered by the revenue.
- viii. Have an active and inclusive participation of community members during the whole process. It is important that women and youth from the community participate in controlling good logging practices and timber sales, in reporting back to the community, and in deciding about community investments. Participation is important for the community to be informed on the activities that the logging company does in their forests and to control that the contract is obeyed.

Timber sales contracts are legally binding commercial contracts. Important elements to check before the negotiation and signing of the contract include:

- i. Community has legal papers (title or deed) on its lands;
- ii. Forest license and other permits as required by law;
- iii. Appropriate pre-harvest inventory has been carried out;
- iv. Relationships between loggers and communities should be based on mutual respect, and following social best practices;
- v. Contracts should take place based on free decision making, good faith, transparency, community control and shared responsibility for timber resource use;
- vi. Community understands the benefits and costs for the community, the overall economic context and how the logging contract would affect their families;
- vii. Communities are informed of timber prices in other nearby towns to secure fair prices for their community;
- viii. Communities may want to look for partnerships with other organizations they trust in order to get help or training in responsible forest use and monitoring the implementation of logging contracts; and
- ix. It is very important that the forest authority gives the needed information for full compliance of logging contract.

## 8.2 Agreement and contract

Logging contracts should be guided by the local market price from other nearby communities, towns and by the principle of fair trade, looking for mutual benefits and get rid of abuses and social exploitation or even perception of such practices.

Community should make sure that the contract:

- i. Complies with community agreements and plans;
- ii. Complies with national laws and regulations, and with international laws and those of indigenous people at the national level;
- iii. Ensures fair forest resources benefit sharing for all community members, ensuring full property rights of the community for the use of forest resources;
- iv. Ensures forest management best practices (Table 2) and supports forest conservation, combat illegal logging and corruption;

### TABLE 2 BEST PRACTICES FOR FOREST MANAGEMENT

- Soil, forest and water conservation
- Law compliance
- Community participation
- Low impact felling, skidding and transportation
- Accurate timber measurement
- Supervision by forest authority, community and civil society

- v. Respects forest management plans and annual operations plan;
- vi. Includes clearly laid-out voiding clauses such as those listed in Table 3;
- vii. Voids all kind of timber sales with questionable social arrangements or unfair trade practices (advances, in-kind payments, barter etc.) as they prevent free and independent community decision in timber sales; easily create confusion and have the tendency of lowering timber values; and
- viii. Be formally registered and notarized according to national regulations so that they are fully legal. Avoid informal verbal and simple agreements; as in most countries, they do not have legal value or at least lead to disagreement more easily.

### TABLE 3 EXAMPLES OF VOIDING CLAUSES TO INCLUDE IN THE CONTRACT

- Harvest of selected and pre-identified seed trees
- Harvest of unauthorized trees
- Cheating in volume calculation
- Environmental damage
- Illegal logging and inappropriate use of forest permits



In order to keep transparency and avoid community conflict, the community's assembly should make the final decision on timber sales contracts. A contract should include, at the minimum, information listed in Table 4.

**TABLE 4 KEY ELEMENTS OF A LOGGING CONTRACT**

1. *Name:* Forest industry and community representative
2. *Contract purpose:* timber sale types and types of sale
3. *Delivery place and date:* Contracts need to include agreement on product delivery place (log yard, river port, etc.) and also provide details regarding discounts related to the quality of products. Logging contract duration based on clear dates and deadlines for all activities including timber delivery dates. Consider deadlines established by law and other regulatory procedures of the forest sector such as forest permits.
4. *Price:* Contracts should be clear, establishing timber quantity, quality and prices. Communities should not agree on payments based on percentages rather than monetary prices, as it may be unfair. It should also be clear how payments and timber volumes will be calculated (standing tree, logs, sawnwood, etc.). Logging contracts should include prices per volume unit (m3, m2, cubic feet etc.) for each type of timber. Timber prices should also include the cost of forest fees and taxes based on the country's laws and regulations. Payments for preparing and processing forest management plans, AOP and other permits are paid by the community, thus they should be included in the sales prices. If the logger pays them in advance, the total amount of those payments - like all advance payments - should be included in the contract.
5. *Terms of payment:* Payments must take place as soon as timber is measured and delivered, according to the logging contract. It is recommended that payments be made in bank checks or transfers instead of cash, as it is more transparent and secure. Due dates and penalties for late payment need to be established.
6. *Agreements and obligations:* When selling standing timber, it should be clear in the logging contract that the forest management plan and annual operational plan compliance is a shared responsibility of both the community and the logger. In this way, the logger pays the cost of felling, skidding, field laborers and local botanists, even if they are community members. This section should include: timber measurement system to be used, grades, forest management plans and compliance conditions, conditions for complying with best practices, for using forest permits, transportation documents, bill of sales and other forest control documentation, as well as compliance with environmental and social best practices.
7. *Conflict resolution and mediation clause*
8. *Provision for voiding the contract:* Illegal logging, illegal use of forest control documents, harvesting of unauthorized trees, etc.
9. Contract monitoring
10. *Other issues:* e.g. If the contract is transferable or other, locally relevant conditions; if appropriate, stipulations on forest certification.
11. *Date and signatures*

Other recommendations include:

- i. Communities should not accept separate agreements from the main contract or informal arrangements such as in-kind payments (food staples, etc.) as advance payments. This will make them dependent on loggers;
- ii. In the case of communities harvesting timber themselves and in need of upfront capital from the logger or logging industry, it is recommended that these advances are not used to re-negotiate lowering timber sales prices;
- iii. Logging contracts should support value chains for forest products from the forest to sawmills and final markets; and
- iv. Logging contracts may include a provision related to participation of the government forest ranger or other agent (in some countries required by law) and an independent monitor. Also, contracts should include conditions and obligations of each of the partners selected to help monitor contract implementation. This improves community capacity, increases transparency and community control, and prevents conflicts between loggers and communities.

If, for any reason, a power of attorney is needed, it should be given solely for a specific task and should not be beyond the forest management plan approval.

## 8.3 Implementation

Monitoring is an essential part of contract implementation. Monitoring logging activities is needed to make sure that the contract is being followed and community rights respected. It is a good practice that the community sets up and elects committees for forestry monitoring<sup>16</sup>. Some of the duties of the committees include:

- i. Making sure that the logging contract specifies who is responsible for monitoring and supervision of the contract;
- ii. Ensuring compliance with best practices for felling, skidding, etc. Communities have to make sure that harvest includes only those trees approved in the operational plan;
- iii. Ensuring that seed trees are protected based on the forest management plan;
- iv. Ensuring the use of established good practices for forest, water and soil conservation during construction of log yards, forest roads and other harvest infrastructure. These constructions should be built based on prescriptions in the management plan, avoid damaging standing trees, water streams or the surrounding nature;
- v. Ensuring participation in timber measurement by the community's own control and supervision committee, forest ranger and logger. Logs should be measured based on conventional measuring systems at the log yards or in an agreed-upon delivery place; and
- vi. Requesting assistance from representative organizations, NGOs etc. in contract negotiations and monitoring.

In addition to the monitoring from the community, forest officers should verify that the only trees harvested are those authorized by the approved plans. Also, forest authorities should determine the total timber volume to be harvested so that forest permits include the right volume. This will help to avoid illegal logging. Forest verification from forest officers is key in ensuring the compliance of forestry law and regulation at national and regional level.

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16. Good examples are *Veedurias Forestales* in Peru and independent forest monitoring arrangements.

## 9. LESSONS LEARNT

In general, forest user communities often do not have adequate knowledge to manage their timber resources for commercial production. For this reason, it is important to assist them through the whole process of timber sales: from forest management planning, implementation of management plans, development of annual operation plans, contract negotiation with logging companies and other buyers, strengthening of their institutions, etc.

Junkin (2007) underlines the importance of technical assistance to community forestry enterprises in Guatemala as a precondition for their success and sustainability. In this case, communities received technical assistance, and financial and business services that helped them to develop enterprises through internal structuring and organization, identification of market opportunities, the design of products appropriate to the market realities, allowing the enterprises to fulfill their cash flow needs for operations and invest in infrastructure to improve their product offering.

Indigenous peoples communities often lack the necessary commercial skills needed to ensure fair logging contracts. Many of the issues covered in the note are not very complex and need essentially only more *due diligence* in the process. The essential nature of logging contracts as commercial contracts between a willing buyer and willing seller needs to be maintained. The main issue is to make sure that all parties are well-informed and both parties can make decisions that help them to be active parties in timber trade.

Fair and well-functioning timber markets can become drivers of a well-functioning wood-based rural economy. Forest-based value chains can create jobs and generate income. This is an essential part of sustainable social and economic development. In natural resource sectors, environmental sustainability also needs to be maintained.

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