Food and Agriculture Organization of the United Nations

National **forest monitoring** system assessment tool

Quick guidance

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Executive summary

The national forest monitoring system (NFMS) assessment tool has been developed under the project *"Building global capacity to increase transparency in the forest sector (CBIT-Forest)"* implemented by Food and Agriculture Organization of the United Nations (FAO) and funded by the Capacity-Building Initiative for Transparency (CBIT) trust fund of the Global Environment Facility (GEF).

The tool aims to assist countries in carrying out a comprehensive capacity assessment of forest monitoring across three complementary themes – institutional arrangements, measurement and estimation, and reporting and verification.

The tool is based on FAO's Voluntary Guidelines on National Forest Monitoring (VGNFM) reinforced by the REDDcompass of the Global Forest Observations Initiative (GFOI) and incorporating FAO's extensive field experience of forest monitoring in different national contexts.

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1 Introduction

Establishing and operating a National Forest Monitoring System (NFMS) constitutes a complex scientific-technical task and an organizational and institutional challenge. It requires proper planning and design of the scientific and technical elements of NFMS as well as support from the government and various stakeholders involved in the process.

A lack of institutional and individual capacity often undermines the long-term impact of otherwise technically sound programmes. To support efforts towards sound and impactful forest monitoring, the Food and Agriculture Organization of the United Nations (FAO) has developed an NFMS assessment tool to help countries identify capacity gaps and weaknesses in order to address their real needs in a targeted manner. FAO's new tool facilitates the identification of needs and gaps in order to establish or strengthen a country's forest monitoring.

The tool has been developed based on the FAO Voluntary Guidelines on National Forest Monitoring (VGNFM)[1] that provide good practice principles, a framework with guidelines, and scientifically sound tools and practices adapted to national context in order to create and operate their NFMS (FAO, 2016), and it is reinforced with the REDDcompass resources of the Global Forest Observations Initiative (GFOI).

[1] The Voluntary Guidelines on National Forest Monitoring (VGNFM) were approved by the 23rd session of the FAO Committee on Forestry (COFO 23) in July 2016. As recommended by COFO earlier, they take into account the requirements for REDD+ reporting and are in line with the principles and goals of the Forest Instrument. They serve as a technical reference for government agencies responsible for forest monitoring. In addition, they can be used by educational and research institutions, the public and private sectors, civil society and other key stakeholders in forest issues.

The tool, which comes under the project "Building global capacity to increase transparency in the forest sector (CBIT-Forest)", also incorporates FAO's extensive field experience of forest monitoring in different national contexts.

Objectives

The NFMS assessment tool aims to assist countries in strengthening their forest monitoring by:

- facilitating understanding of the Voluntary Guidelines on National Forest Monitoring;
- identifying needs, gaps and weaknesses, enhancing opportunities to focus a country's efforts and investments;
- helping to organize international cooperation and build a work plan together with stakeholders and partners;
- assessing progress in identifying capacity gaps in forest monitoring;
- encouraging harmonization of processes to set up a stronger and more robust NFMS.

2 Targeted users

The NFMS assessment tool has been designed to be used by government bodies responsible for forest monitoring, educational and research institutions, the public and private sectors, civil society and other key stakeholders.

3 Structure of the tool

The tool provides an assessment of an NFMS in relation to key good practices aggregated into three complementary themes:

1. institutional arrangements,
2. measurement and estimation, and
3. reporting and verification.

The graphic highlights institutional arrangements as the foundation of a robust and sustainable NFMS, which the other two themes build on.

The Excel-based NFMS assessment tool, available in English, French or Spanish, is composed of a set of linked sheets (29 in total). Free and open to all interested stakeholders, it is accessible and can be downloaded from the following links:

- FAO e-learning course: Forests and transparency under the Paris Agreement: elearning.fao.org/course/view.php?id=587;
- FAO REDD+ web page: www.fao.org/redd/information-resources/publications; and
- CBIT-Forest web page: www.fao.org/in-action/boosting-transparency-forest-data/resources/publications.

MEASUREMENT AND ESTIMATION

- ☐ Identification of information needs
- ☐ Data management and archiving
- ☐ Preparation
- ☐ Design for field data collection and remote sensing
- ☐ Operational design (field and remote sensing)
- ☐ Dara management, data analyses and documentation

REPORTING AND VERIFICATION

- ☐ Communication and dissemination
- ☐ Preparation and submission of reports

INSTITUTIONAL ARRANGEMENTS

- ☐ Institutionalization
- ☐ Developing national capacity
- ☐ Developing partnerships and collaboration
- ☐ Strenghthening research and research institutions in forest monitoring
- ☐ Mandate
- ☐ Stakeholder identification and engagement
- ☐ Integration of young experts
- ☐ Impact assessment

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4 Steps involved in the assessment

The NFMS assessment tool follows a five-step approach.

Step 1: Select language and country

After clicking START, users can select the language of their choice from the dropdown list on the second sheet, enter the country for which a capacity assessment is to be carried out, and date the assessment.

Step 2: : Identify gaps and needs in institutional arrangements

In this step, the existing institutional capacities can be evaluated by clicking the "Institutional arrangements" tab.

Step 3: Identify gaps and needs in measurement and estimation

Elements of the NFMS associated with preparation and implementation, as well as other technical and scientific issues, can be evaluated here. To assess these elements, click the "Measurement and estimation" tab.

Step 4: Identify gaps and needs in reporting and verification

The NFMS capacities associated with communication, dissemination, data documentation and reporting can be evaluated by clicking the "Reporting and verification" tab.

Step 5: View the results of the capacity assessment

In the last step, the results of the assessment and identification of existing capacities and gaps can be viewed by clicking the "Analysis" tab.

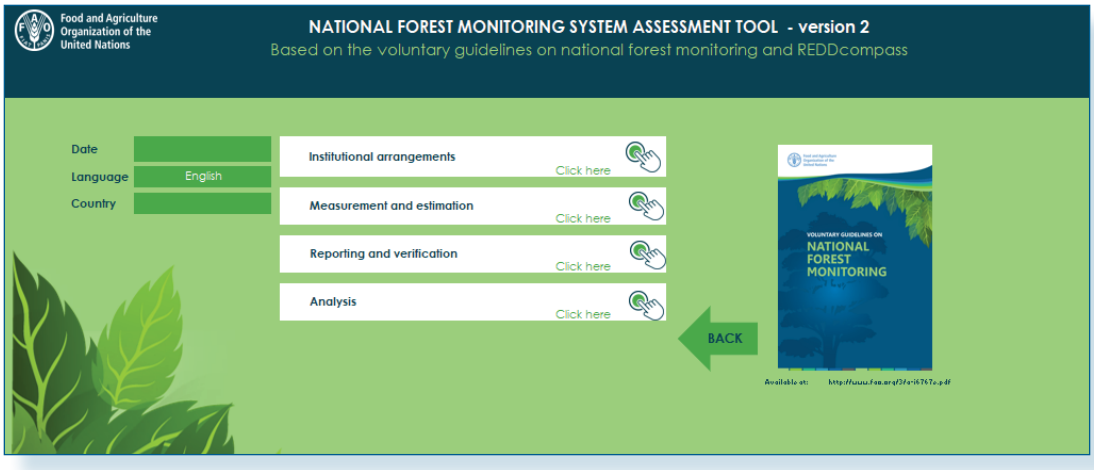
Getting started with the NFMS assessment tool

Download and open the Excel-based tool to access the voluntary guidelines on national forest monitoring by clicking START on the first sheet (Figure 1).

Figure 1 Getting started with the NFMS assessment tool

On the second sheet insert the date, language (English, French or Spanish) and country for which a capacity assessment is to be carried out (Figure 2).

Figure 2 Continuing with the assessment



Users of the NFMS assessment tool are required to evaluate the various elements associated with institutional arrangements, measurement and estimation, and reporting and verification. To carry out a capacity assessment, the guidelines can be rated by selecting 0, 1 or 3 from the dropdown list. Throughout the tool, the options in the dropdown list are the same. Table 1 shows the evaluation options included in the dropdown list and their description. When values are selected from the dropdown list, the cells automatically fill with colour.

Table 1 Evaluation options and their descriptions included in the dropdown list

0:	No action has been taken in the country regarding this guideline or it evinces many weaknesses and needs in the attainment of outcomes. This deserves priority.
1:	There is awareness in the country about the guideline and actions are taken to implement it, though technical support is required.
3:	There is enough capacity in the country to implement the guideline. There are no gaps or needs whatsoever, so it is expected to meet the outcomes accordingly.

4.1 Institutional arrangements

Click the "Institutional arrangements" tab on the second sheet of the tool to view the elements and their descriptions, as shown in Figure 3.

Figure 3 The NFMS elements under institutional arrangements

Food and Agriculture Organization of the United Nations

NATIONAL FOREST MONITORING SYSTEM ASSESSMENT TOOL - version 2

Based on the voluntary guidelines on national forest monitoring and REDDcompass

Institutional arrangements

Elements	Mapping	Description	Average
3.1 Institutionalization	¥GNFM	Provided that the NFMS is firmly, formally and permanently embedded in the national administration. The existence of a legal basis, a financial commitment, a permanent institutional framework and inter-institutional coordination to ensure efficient implementation and operation.	#DIV/0!
3.2 Developing national capacity	¥GNFM	Identification of current assets and staff capabilities, gaps and need for information according to institutional mandates, develop the capacity building strategy, including the academia.	#DIV/0!
3.3 Developing partnerships and collaboration	¥GNFM	Identification of 1) partnerships with specialized national and international institutions; 2) agreements related to intellectual property, 3) cross sectoral coordination and the integration of additional variables or recipient resources.	#DIV/0!
3.4 Strengthening research and research institutions in forest monitoring	¥GNFM	The data generated by NFMS offer multiple opportunities for research. Describe the information flow and if the research objectives were clearly defined. Scientific research needs were identified to fill existing information gaps. Collaboration with different research units was put forward. Networking with national and international research institutions was leveraged for an adequate dissemination of results.	#DIV/0!
4.1 Mandate	¥GNFM	Political mandate. Scope, objectives and measurable short and long term goals. A coordinating body when the NFMS is implemented in a decentralized manner. Clear designation of responsibilities, duties, budget, human resources and infrastructure of the participating entities.	#DIV/0!
4.3 Stakeholder identification and engagement	¥GNFM	Involvement of decision-makers and stakeholders (national institutions, private sector, educational institutions, civil society, women and minorities groups, and communities that depend on forests for their livelihoods) Promote institutional technical advisory committees.	#DIV/0!

The institutional arrangements theme is composed by the **foundation** and some of the **strategic** elements of the NFMS, as described in the VGNFM (FAO, 2017). In the tool, the foundation elements are grouped by: (3.1) institutionalization; (3.2) developing national capacity; (3.3) developing partnerships and collaboration; and (3.4) strengthening research and research institutions in forest monitoring. The strategic elements found in this section are represented by: (4.1) mandate; (4.3) stakeholder identification and engagement; (4.5) integration of young experts; and (4.7) impact assessment (Figure 3). The numbers for each element are aligned with those available in the VGNFM.

To identify the potential gaps and needs associated with each element, users must click each element and from the dropdown list select the values that describe the country's actions (Table 1). As each element is composed of several guidelines, the tool automatically calculates the evaluation of an element as an average of all values assigned by users to the relevant guidelines. The results of the evaluation can be seen in the "Average" column, where one of the following numbers will appear:

0:	NNo action has been taken in the country regarding this guideline or it evinces many weaknesses and needs in the attainment of outcomes. This deserves priority.
1–2:	There is awareness in the country about the guideline and actions are taken to implement it, though technical support is required.
3:	There is enough capacity in the country to implement the guideline. There are no gaps or needs whatsoever, so it is expected to meet the outcomes accordingly.

4.2 Measurement and estimation

Click the "Measurement and estimation" tab on the second sheet of the tool to view the measurement and estimation elements and their descriptions, as shown in Figure 4.

Figure 4 The NFMS elements under "measurement and estimation"

Food and Agriculture Organization of the United Nations

NATIONAL FOREST MONITORING SYSTEM ASSESSMENT TOOL - version 2

Based on the voluntary guidelines on national forest monitoring and REDDcompass

Measurement and estimation

Elements	Mapping	Description	Average
4.2 Identification of information needs	VGNFM	It is based on the demand for information with a clear cut vision, knowing the current information and new requirements. The scope, technical needs and requirements of potential users were analysed. Information needs for international forest-related reports (UNFCCC, FRA, CBD, SDGs, among others) were considered, taking into account the format and output. Priorities were established along with accuracy and cost analysis.	#DIV/0!
4.6 Data management and archiving	VGNFM	A long-term plan has been developed for data storage and security, metadata documentation and operating system updates. There is a security protocol which outlines technical measures and data protection. A policy has been implemented for data handling and dissemination, exchange formats and access level according to the type of user. Data storage and responsible bodies should be defined; whenever possible, data should be link and stored with the national statistics database.	#DIV/0!
5.1 Preparation	VGNFM/New/ REDDcompass	Identification of monitoring components, identification and definition of activities to be monitored, adjustment and harmonization of land use/forest type classification, definition of stakeholders, sampling frame, review of existing data and information, setting uncertainty levels and optimization of human resources knowledge.	#DIV/0!
5.2 Design for field data collection and remote sensing *	VGNFM/New/ REDDcompass	Integrate field and remote sensing data. Design of field data collection and surveys (sampling, plots, calculation), allometric models, errors and quality assurance and control. Selection of resources and methods for remote sensing, quality assurance and control, methods for validation of remote sensing outputs; design for visual interpretation through sampling.	#DIV/0!
5.3 Operational design (field and remote sensing)**	VGNFM/New/ REDDcompass	Development of manuals and protocols (field and remote sensing/mapping). Information management system design (tabular and geospatial data). Human resources development. Monitoring and field work planning. Field work execution. Field work supervision. Ancillary data collection and supervision (Supervised execution of remote sensing analysis).	#DIV/0!
5.4 Data management, data analyses, documentation and reporting ***	VGNFM/New/ REDDcompass	Data management with related metadata, location, maintenance guarantee and availability of the data during the time for analysis and researchers queries. Security protocols were developed with a description of technical measures and procedural protections of the information. Data exchange policies were developed considering sensitive data such as: personnel information, plots location, exact tree coordinates.	#DIV/0!

In this section, users can evaluate and assess the existing capacities of some of the **strategic** elements and **operational** elements of NFMS, as presented in the VGNFM and in GFOI's REDDcompass resources which provides a structured approach for developing countries to follow in designing and developing complete national forest monitoring systems and associated MRV procedures.

In this section, the **strategic** elements are represented by: (4.2) identification of information needs; and (4.6) data management and archiving. The **operational** elements are organized by: (5.1) preparation; (5.2) design for field data collection and remote sensing; (5.3) operational design (field and remote sensing); (5.4) data management, data analyses, documentation and reporting. The numbers for each element are aligned with those available in the VGNFM (FAO, 2017).

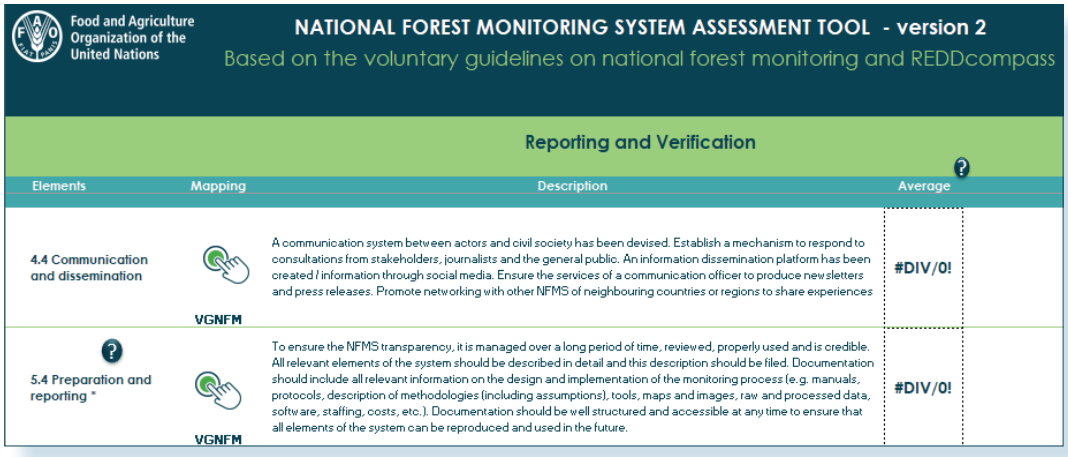
As before, to identify the potential gaps and needs associated with each element, users must click each element and select from the dropdown list the values that describe the country's actions (Table 1). As previously described, the results of the evaluation can be seen in the "Average" column, where one of the following numbers will appear:

0:	NNo action has been taken in the country regarding this guideline or it evinces many weaknesses and needs in the attainment of outcomes. This deserves priority.
1-2:	There is awareness in the country about the guideline and actions are taken to implement it, though technical support is required.
3:	There is enough capacity in the country to implement the guideline. There are no gaps or needs whatsoever, so it is expected to meet the outcomes accordingly.

4.3 Reporting and verification

Under the "Reporting and verification" tab, users can assess the capacities and identify the potential gaps and needs associated with (4.4) communication and dissemination; and (5.4) preparation and reporting (Figure 5). These two elements (4.4, 5.4) are **operational** elements of an NFMS. Again users must click each element and select from the dropdown list the values that describe the country's actions. As before, the results of the evaluation can be seen in the "Average" column.

Figure 5 NFMS elements under "reporting and verification"



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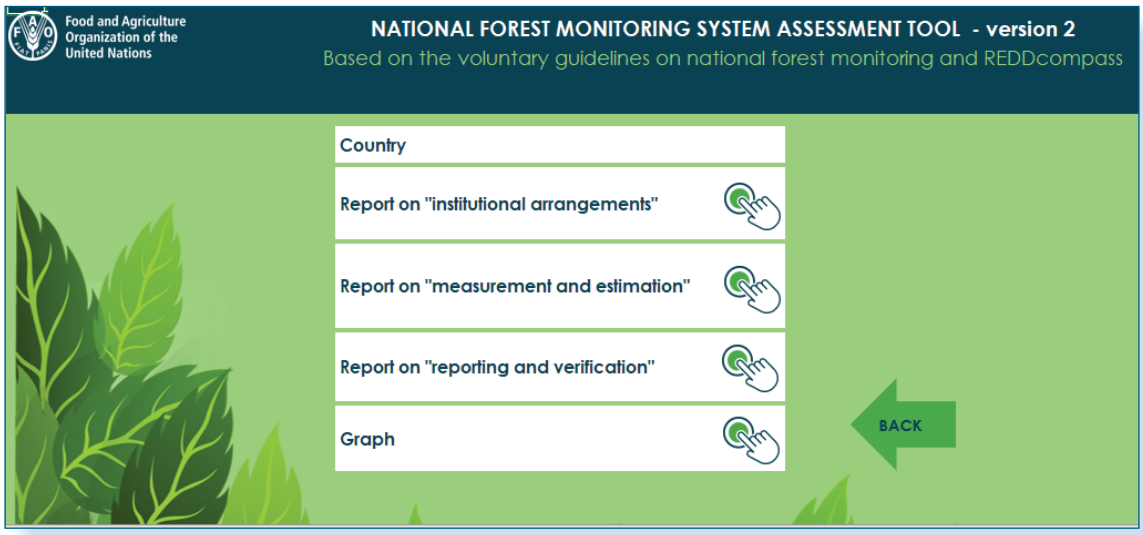
5 Analysis

Once a capacity assessment has been completed, the results can be viewed by clicking the "Analysis" tab (Figure 6).

Figure 6 Screenshot of the results that can be found under the "Analysis" tab



The results of the capacity assessment can be viewed in two different ways:

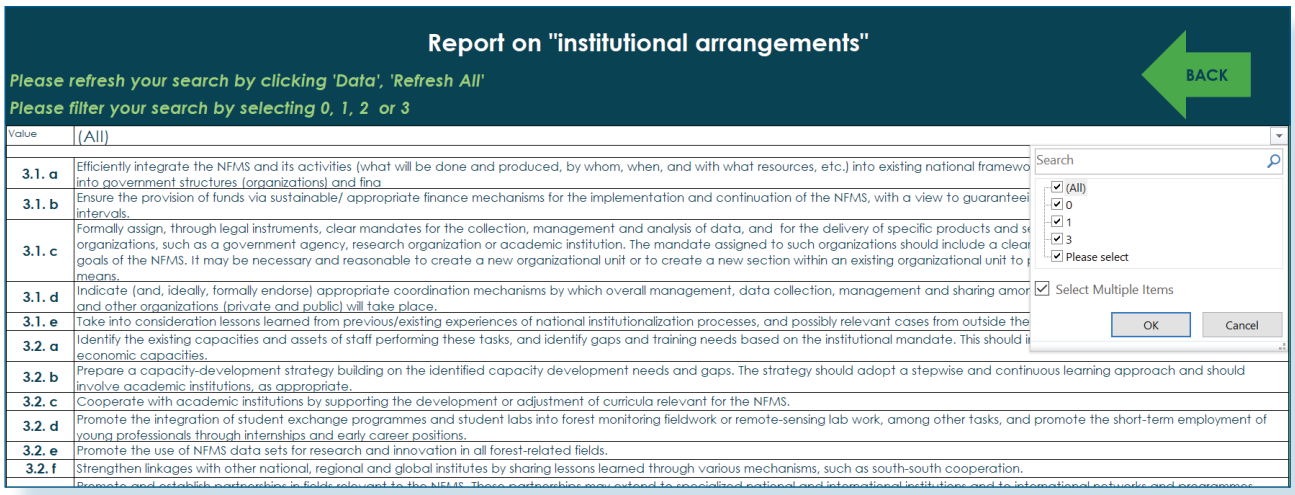
1. Report: To view the results as a report, users can click on one of the following tabs:

- Report on "institutional arrangements";
- Report on "measurement and estimation";
- Report on "reporting and verification".

On clicking a "Report" tab, a list appears of all relevant guidelines evaluated by users.

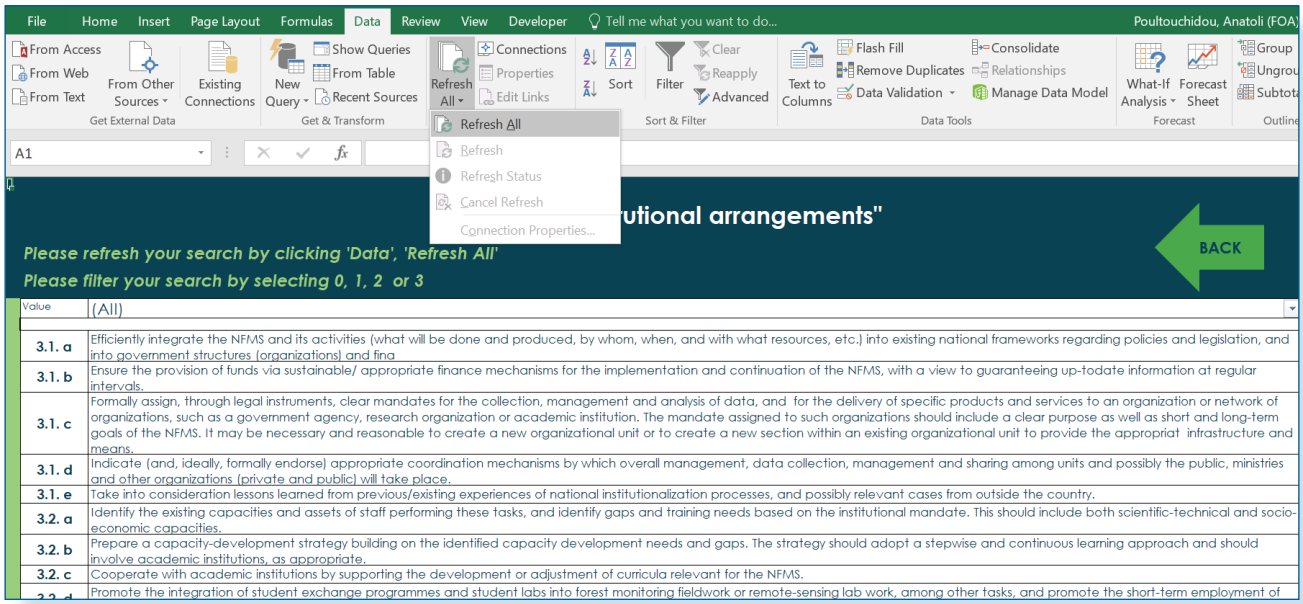
The results can be sorted by clicking the filter in each list (Figure 7).

Figure 7 Screenshot of the report on "institutional arrangements"



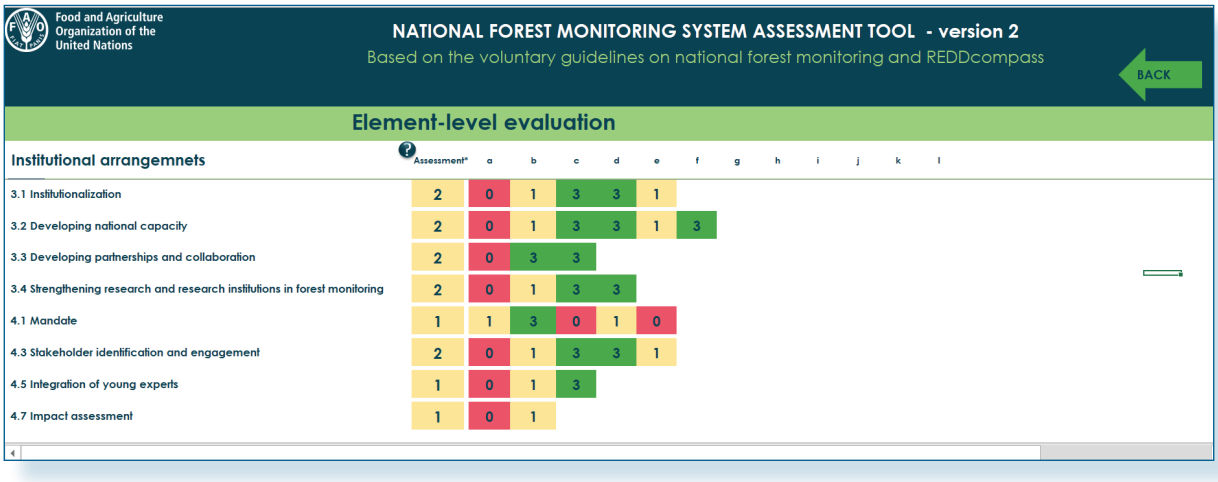
To refresh the search carried out by filter, users must click the "Data" tab and then "Refresh All" (Figure 8).

Figure 8 Screenshot showing how to refresh the search by filter



2. Graph: The results can also be displayed as a graph. To view the results of the capacity assessment as a graphical representation, click the "Graph" tab (Figure 8).

Figure 9 Example of a graphical representation of capacity assessment results



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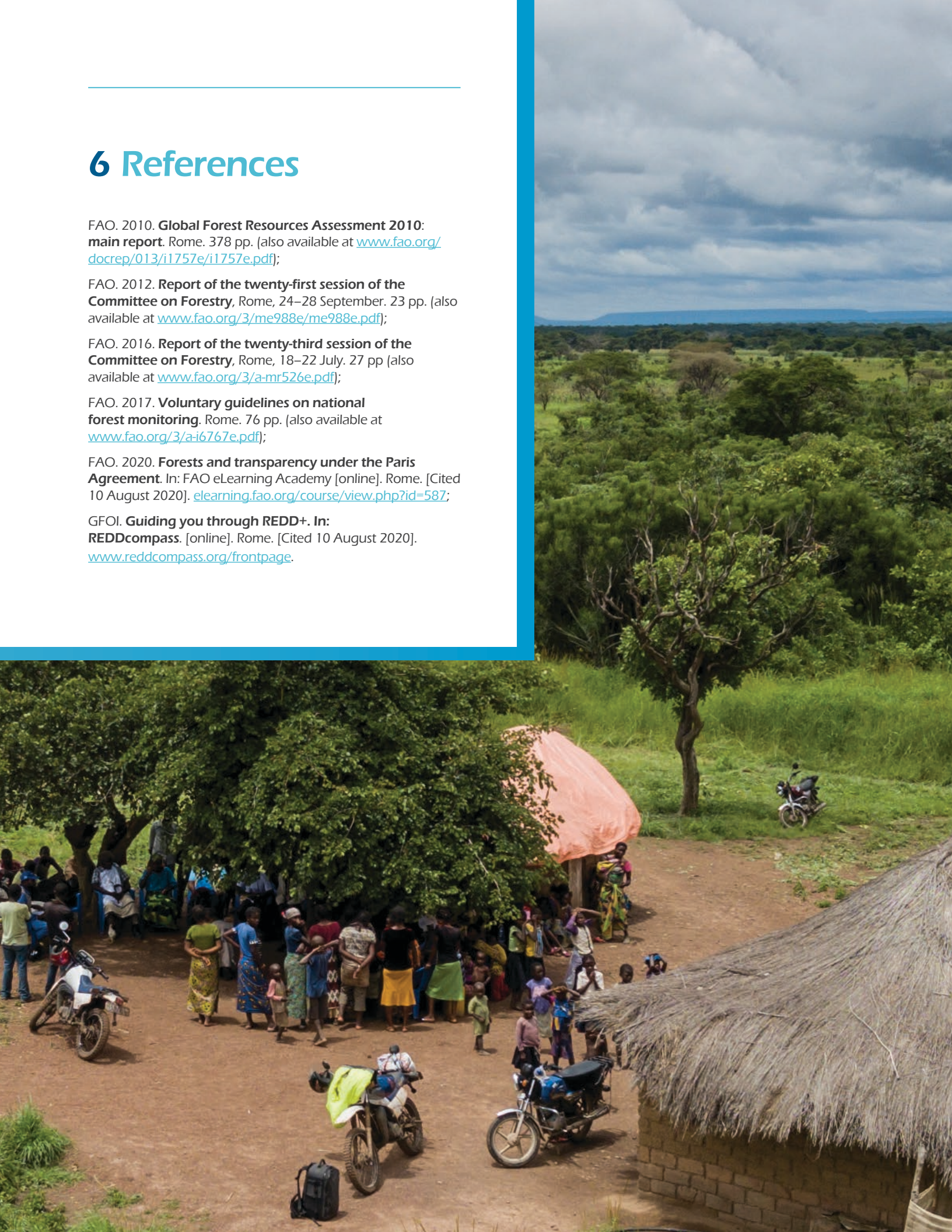

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