

Institutionalization of forest data

Lesson 1: Foundation and strategic elements of an NFMS

Text-only version

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This lesson describes the **foundation and strategic elements** of an NFMS, as defined in the VGNFM.

These elements are key to preparing the ground for efficient **planning and implementation** of an **NFMS** as a long-term undertaking.

Learning objectives

At the end of this lesson, you will be able to:

- understand the foundation elements and the strategic elements to strengthen institutional arrangements for the efficient planning and definition of a National Forest Monitoring System (NFMS); and
- explain the good practices of the foundation and strategic elements.

Key factors and legal challenges for institutionalizing an NFMS

FAO plays a significant role in assisting countries in establishing an NFMS, by following the principles and guidelines outlined in the *Voluntary guidelines on national forest monitoring (VGNFM)* approved and endorsed by member countries.

Establishing an NFMS is a long-term objective that requires setting up a **legal basis, financial commitment, and a permanent institutional framework** to ensure efficient implementation and operation. The institutionalization process involves creating a **set of systems, policies, rules and processes** that public and private institutions use to manage and coordinate their relations and activities, either internally or with other institutions. These institutional arrangements are crucial to establishing a permanent and sustainable NFMS.

Importance of institutionalization

The institutionalization layer in the establishment of an NFMS is crucial, as it ensures that the system is fully integrated into the country's forest administration, making it a formal and permanent feature of the country's forest monitoring and management activities. This helps to enhance the effectiveness, transparency and accountability of the NFMS and ensures that it operates in a manner that is consistent with the country's forest management objectives.

What are the FAO Voluntary guidelines on national forest monitoring (VGNFM)?

The FAO VGNFM are a **set of guidelines and good practices** designed to assist countries in establishing and implementing the sustainability of their National Forest Monitoring Systems. These guidelines aim to improve a country's ability to collect, analyse and report data on their forests, which can inform their forest management, policy and planning decisions. The guidelines cover a variety of topics, such as **remote sensing, forest inventories, and monitoring and reporting systems**, to provide guidance on how to effectively monitor forest resources. Additionally, the guidelines emphasize the importance of stakeholder engagement and collaboration to ensure that forest monitoring efforts are **effective** and **inclusive**, with a long-term vision.

Principles for a sustainable NFMS

The VGNFM identify **five groups of principles** that together incorporate the 14 principles presented in this page.

Principles

Governance

1: Country ownership and responsibility

Implementing a National Forest Monitoring System and generating a reliable database on forests and their uses is primarily a domestic issue.

2: Legal and policy basis

In some contexts, it may be helpful to establish a legal basis for national forest monitoring, for example, by adding a corresponding paragraph to a national forest law, as well as related policy.

3: Landscape view

It is essential to look at forests as one component within a forested landscape.

4: Institutionalization of NFM

One of the distinct features of forestry is its long-term character, which consequently requires a

Scope		long-term structure, implemented through a permanent institution.
	5: Research infrastructure and capacity building	Any national survey requires appropriate national capacities and a research infrastructure in order to be successfully implemented under country ownership.
	6: Participatory discussion process	National Forest Monitoring Systems generate data and information on forests and trees at national level through a participatory discussion process among national stakeholders on the scope and objectives of forest monitoring.
	7: Satisfaction of national information needs	Information needs regarding national forest and tree resources are manifold. Accordingly, the consensus-oriented discussion process (<i>Principle 6</i>) prepares the ground for a comprehensive identification of priority information needs at subnational and national level, while efficiently supporting international reporting commitments.
	8: Integration of and consistency with existing information sources	National Forest Monitoring should not be considered a standalone initiative, but in best case scenarios an undertaking that interlinks with other national and subnational initiatives that generate national-level information.
Design	9: Flexible approach	The technical and organizational design of an NFMS requires long-term efforts and must be able to integrate emerging issues and allow for periodic revisions.

Data	10: Multi-purpose approach	Information and knowledge generated by National Forest Monitoring Systems need to feed into and support national and international forest-related processes. In order to serve these processes, National Forest Monitoring Systems need to be multi-purpose.
	11: Feasibility including cost-efficiency	Information provision, including data collection, storage and analysis, and operation of a permanently institutionalized forest-monitoring unit, must be feasible and affordable, according to national circumstances.
	12: A well-defined data and information-sharing policy	Data and information produced by National Forest Monitoring Systems are of interest to many different parties. They should be accessible to different users, either as original or aggregated data sets. This does not necessarily mean that public access is granted to a database, but that a clear data-sharing policy is formulated, to which national and international interested parties can refer.
	13: Credibility through transparency and quality	This implies that the results must be produced in a manner that is scientifically defensible, which means that each methodological and organizational step of the approach needs to be fully and transparently documented and justified.

Overall principles	14: Collaboration at the international level	Collaboration in planning, implementing, analysing and ensuring the quality of different National Forest Monitoring Systems constitutes an excellent means of knowledge exchange and avoiding common errors and pitfalls. In addition, it may support national capacity building.
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Elements for a sustainable NFMS

The VGNFM suggests **three types of element**:

1. **Foundation elements** - refer to the organizational and technical *framework conditions* within which an NFMS is implemented.
2. **Strategic elements** - refer to *organizational and planning actions* for data collection activities within an NFMS.
3. **Operational elements** - refer to actions for the optimization and definition of *technical design elements* of field and remote-sensing data collection and analysis.

In this course we will focus only on the foundation and strategic elements, which are key to institutionalizing an NFMS.

➤ Foundation elements

The foundation elements of the VGNFM prepare the ground for efficient planning and implementation of an NFMS as a long-term undertaking. For the design and implementation of those elements, it is important to bear in mind that a participatory and inclusive process is required at all stages, ensuring adequate consultations with all parties involved in the design and institutionalization of the NFMS. The following foundation elements may be pursued simultaneously:

Institutionalization of NFMS

Institutionalization means that the NFMS is **formally, firmly and permanently embedded within an administration – usually the forest administration** – of a country. Because an NFMS is a long-term endeavour, a legal basis, financial commitment and a permanent institutional framework are crucial to ensuring efficient implementation and operation.

Developing national capacity	National ownership and sustainability of the NFMS depend on institutional capacities to meet the forest information needs of users. This calls for continuous strengthening of human capacities in the technical fields of forest monitoring, programme management, administration and operation. The NFMS should ensure that person(s) responsible for implementation have the appropriate level of education and the necessary knowledge and experience.
Developing partnerships and collaboration	Nearly all forested regions can point to successful examples of national-level or subnational forest assessment. More and more countries are implementing full National Forest Monitoring Systems, providing excellent opportunities for international and regional collaboration and the sharing of experiences regarding planning, implementation, analyses, capacity building, technical expertise and lessons learned – both success stories and failures.
Strengthening research and research institutions in forest monitoring	Planning and successful long-term implementation of an NFMS requires accompanying research in all cases, albeit to a varying degree. Generic research questions include how to optimize technical design elements of forest inventories, the development of locally-specific models to predict biomass or carbon stocks, and the development of optimal remote-sensing analysis approaches. In addition, the data generated by an NFMS offer manifold opportunities for research beyond the specific field of forest monitoring.

➡ Strategic elements

Strategic elements define the course of the NFMS as well as specific issues in terms of ‘how’ and ‘who’, without addressing detailed technical-scientific aspects, which are dealt with under Operational elements. Strategic elements should ideally be reviewed periodically to ensure that they still apply to the current (and anticipated future) needs of the NFMS. The NFMS should not be perceived as a static system, but should rather address evolving issues and integrate new components and technological

advances wherever sensible and feasible. However, it is important to maintain consistency over time to maintain the capacity to estimate changes and establish time series for relevant variables and topics.

Strategic elements of the VGNFM refer to organizational and planning actions for data collection activities within an NFMS. These actions include the following:

➤ **Mandate**

The implementation of an NFMS requires a clear political mandate, which can only be issued by a government body. Mandates also usually imply the definition of a vision, goals, targets and available resources, including budget, personnel and infrastructure. In some cases, legal regulations are also necessary, for example, to facilitate access to private land to conduct field inventories.

➤ **Identification of information needs**

The objective of an NFMS should be to produce the best possible information within the given resource constraints. An information needs assessment process is a key step in identifying which information the NFMS should produce on a regular basis.

Once current and prospective information needs are known, the design of the NFMS can be defined (or revised) by the responsible government entity, while involving relevant stakeholders at each main step of the process. The results of the information needs assessment are used to determine and prioritize the data to be collected.

Information needs assessments should therefore be managed to ensure that the results are oriented towards the strategic information needs of governments and other stakeholders, while focusing on essential information that can feasibly be covered by the monitoring system.

➤ **Stakeholder identification and engagement**

The organization leading the NFMS process is responsible for stakeholder identification. However, the list of stakeholders should be validated during the information needs assessment phase. In this context, a stakeholder analysis implies a review of all possible partners/organizations in the country using forest information, either directly or indirectly.

The involvement of stakeholders may extend far beyond expectations stated during the information needs assessment. Depending on their interest and expectations, representatives of stakeholders' groups may be invited to or integrated into the strategic or technical planning of the NFMS.

➤ **Communication and dissemination**

Proactive communication and dissemination are crucial to ensure that potentially interested stakeholders are sufficiently aware of the existence of the NFMS and its related activities, thereby facilitating access to the results produced and the methodologies applied whenever needed.

➤ **Integration of young experts**

National Forest Monitoring Programmes are complex multidisciplinary and transdisciplinary undertakings, in which numerous professionals from different academic backgrounds with different technical skills collaborate closely with the assistance of numerous helpers. An NFMS offers excellent vocational training and educational opportunities for students and young experts in the early stages of their careers. They can engage in various functions to further develop their knowledge and expertise, not only regarding national forest monitoring, but also regarding the forest resources of their country.

➤ **Data management and archiving**

National Forest Monitoring Systems are dynamic systems that require continuous development in line with new scientific findings on data collection strategies, evolving information needs and new forest-related policies. An important component of this development is the capacity to learn lessons from the NFMS during the implementation process, and after its conclusion. Although not yet a standard component of an NFMS, it is recommended to plan a systematic impact assessment of the process itself. This helps to streamline improvement of the NFMS and to analyse its overall usefulness.

➤ **Impact assessment**

The immediate outcome of an NFMS is data, either collected in the field or obtained using remote-sensing data sources at specified intervals, from which targeted information regarding the current status and changes is derived for decision-making purposes. Provision needs to be made for long-term data management, to allow analyses to be repeated and time series to be built from inventories at earlier points in time. It is therefore recommended to incorporate comprehensive data management into the design of an NFMS from the outset. Such a data management system is ideally located within the permanent institution responsible for the NFMS, in order to guarantee long-term preservation and availability of data, both for standard analyses and upcoming research questions. Policies on sharing data must also be developed. Special consideration should be given to sensitive data, such as personally identifiable information and plots that may be located on private grounds. If actual coordinates are known, then data users could possibly query the data for valuable trees or invasive species and visit the plot to harvest the trees or remove the invasive species. Hence, consideration should be given to

providing only approximate locations and restricting the dissemination of actual coordinates to the analysts concerned, or to making publicly accessible only aggregated data.

Stakeholder mapping

Mapping of stakeholders is useful to help understand the support, role or opposition you may encounter from different actors on the NFMS design and implementation.

WHEN TO USE IT	It is an exercise that helps to identify the key actors involved in the management of forests, their roles, and resources.
HOW TO USE IT	It should be conducted and used during the planning and implementation stages of the NFMS.
WHAT IT IS	<p>To build the map, you need to analyse your stakeholders according to the categories presented in the layer.</p> <p>In the context of an NFMS, stakeholder mapping is a valuable exercise that helps to identify and understand critical actors involved in the management of forests, their specific roles, and available resources in the context of forest monitoring. Here are some categories that need to be considered to build the stakeholder map:</p> <ol style="list-style-type: none"> 1. Sector (public/private/Non-governmental organizations); 2. stakeholder name; 3. their roles as users or producers of forest information; 4. their specific official mandates; 5. potential roles in the NFMS; and 6. existing financial and human resources.

Strong participation and engagement of stakeholder groups is key to the overall success of an NFMS and contributes significantly to creating national ownership. However, in some cases the main constraint on genuine and proactive participation is lack of political will to support the NFMS process.

Summary

In this lesson, you have learned that:

- For efficient planning and implementation of an NFMS as a long-term undertaking, it is important to consider the **foundation** and **strategic elements** of the **VGNFM**.
- **Foundation elements** refer to the **organizational** and **technical** framework conditions within which an NFMS is implemented. These include: institutionalization; developing national capacity; developing partnerships and collaboration; and strengthening research and research institutions.
- **Strategic elements** refer to **organizational** and **planning** actions for **data collection** activities within an NFMS. These include: mandate; identification of information needs; stakeholder identification and engagement; communication and dissemination; integration of young experts; data management and archiving; and impact assessment.
- **Good practices** for both foundation and strategic elements will help to ensure that the NFMS is **well integrated** in a country's **forest administration**.