



POLICY BRIEF

CRITERIA AND INDICATOR-BASED INTERNATIONAL MONITORING, ASSESSMENT AND REPORTING



SUMMARY

Monitoring, assessing and reporting (MAR) on forest data and information have been part of global and national forest policy and management systems for many decades. In the early 1990s, forests emerged on the global political agenda, due to unacceptable rates of deforestation and degradation with implications for people and biodiversity.

Since the United Nations Conference on Environment and Development (UNCED) 1992 in Rio, several international initiatives have developed criteria and indicators as a framework for sustainable forest management (SFM). Criteria and indicators (C&I) are applied as a powerful tool to ensure that MAR covers the full complexity of forests, including the seven thematic elements of SFM specified in the Non-Legally Binding Instrument on All Types of Forest (see Box 1).

MAR has benefited communication between different stakeholders about SFM progress. Stakeholders range from forest owners and managers, to, government decision-makers, forest industry, forest associations, private sector companies, forest organizations, environmental organizations, and research and education facilities. A C&I-based MAR system supports quantitative implementation of the three pillars of sustainable development. Governments and international organizations acknowledge the role of C&I in SFM implementation. Many international agencies, and not just those that are part of the UN promote MAR, and support countries to implement it.

MONITORING, ASSESSMENT AND REPORTING IN GLOBAL FOREST POLICY AND MANAGEMENT

Monitoring, assessing and reporting forest information has been a feature of forest policy and management for decades. The Global Forest Resources Assessment of the Food and Agriculture Organization (FAO) initiated in 1946 is an example. Forests became part of the global political agenda at the 1992 Rio Summit of the United Nations Conference on Environment and Development (UNCED). This was the international community's first attempt to address issues around global SFM, in recognition of unacceptable rates of deforestation and degradation and their implications for people and biodiversity (UNCED, 1993).

The Rio Summit defined Forest Principles, broadening understanding of the many roles and benefits of forests. These addressed worldwide concern about forest management, conservation and sustainable development, leading to the use of the seven thematic elements (see Box 1) based on the most common criteria of SFM of a range of forest-reporting processes such as the FAO Global Reporting on Forest Resource Assessment and the Forest Europe and Montréal Processes. C&I for SFM in this respect, were found as a comprehensive,

powerful tool for “assessment and systematic observation of forests”, and define, guide, and assess progress towards sustainable forest management (United Nations 2007; FAO 2015).

BOX 1. The [seven thematic elements](#) for SFM as determined by the UN Forum on Forests (UNFF).

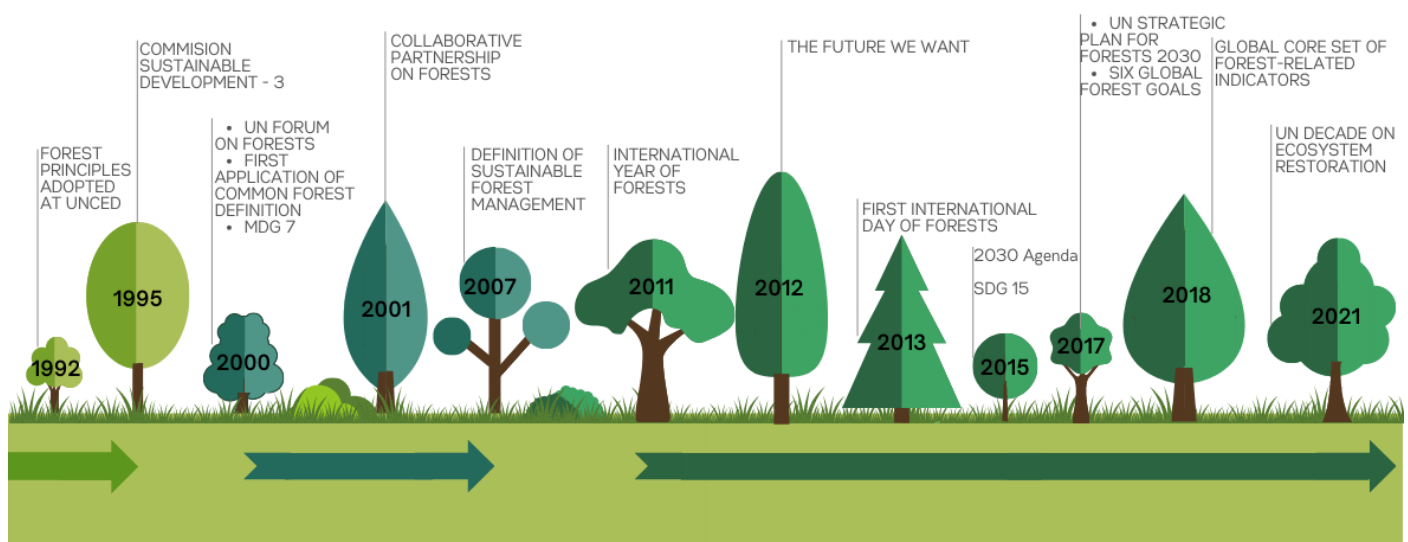
- | | |
|---|--|
| 1. Extent of forest resources, | 5. Protective functions of forest resources |
| 2. Forest biological diversity | 6. Socio-economic functions of forests |
| 3. Forest health and vitality | 7. Legal, policy and institutional framework |
| 4. Productive functions of forest resources | |

After the Rio Summit, international forest negotiations continued for the following decade, resulting in more than 270 proposals for action to translate international goals into country actions (see Figure 1). In 2000, the United Nations Forum on Forests (UNFF) was established to implement these actions. This international arrangement for forests would among others "monitor and assess progress at the national, regional and global levels through reporting by Governments, as well as by regional and international organizations, institutions and instruments, and on this basis consider future actions needed."

The UNFF and the Collaborative Partnership on Forests (CPF) endorsed the development of a monitoring, assessment, and reporting (MAR) system to show how participating countries implemented these actions. Meanwhile, the UNFF promoted use of C&I to frame global forest reporting to assess country progress towards SFM (FAO 2003).

Meanwhile, other international bodies, some forest-specific, recognized the use of indicators as information tools for decision-making and monitoring. A range of indicator-based reporting was initiated by the UN Commission on Sustainable Development (CSD), UN Convention on Biological Diversity (CBD), UN Convention to Combat Deforestation (CCD) and non-UN bodies such as OECD and CIFOR.

Figure 1. Milestones of forest-related issues in the global international agenda 1992-2021



Source: own presentation

UNFF adopted in 2007, a non-legally binding Instrument (NLBI) on Management, Conservation and Sustainable Development of All Types of Forests, hereafter called the Forest Instrument. Member States (MS)

committed themselves to implement a series of policies and measures that are necessary to achieve sustainable forest management. MS agreed to monitor and assess progress towards achieving the objectives of the Forest Instrument, and to submit, voluntarily, national progress reports as part of the regular reporting to the UNFF.

Although substantial efforts have been made in institutional development, governance, and policy progress worldwide (Sotirov et al., 2020), until now governments negotiating within the UNFF have found no legally binding consensus. Many African and European countries are meanwhile moving away from the policy idea of a non-legally binding Instrument (Rayner et al., 2010), however, global forest governance may nevertheless be vital to reducing forest loss due to climate change.

Governments adopted the UN Strategic Plan for Forests 2017-2030 (UNSPF), and 26 associated targets that took a holistic approach, treating forests as necessary for human survival and the environment (Sommer, 2020). This policy development renewed the focus on C&I and on MAR (Arnold et al., 2014).

The adoption of the 2030 Agenda, the UN Sustainable Development Goals (SDGs), and the Paris Climate Agreement created another turning point, by increasing country participation in implementation (Dzebo et al., 2019). This created opportunities for large-scale transformational collective solutions, where forests play a vital role in achieving the SDGs.

THE NEED FOR MONITORING, ASSESSMENT AND REPORTING

Monitoring, assessment and reporting on sustainable forest management has been a key area of work for the UNFF, since its establishment. MAR is a basis for decision-making on forest policy and management and allows the measurement of progress against the implementation of UNFF actions to secure SFM, as well as to review the effectiveness of the International Arrangement on Forests which has five main components: the UN Forum on Forests (UNFF) and its Member States, the UNFF Secretariat, the Collaborative Partnership on Forests (CPF), the UNFF Global Forest Financing Facilitation Network (GFFFN), and the UNFF Trust Fund. MAR aids countries and national organizations in making policy decisions, based on national data, and, at a broader scale, international level organizations, such as FAO. The Global Forest Resources Assessment, UNFF and CBD, compile national data to provide reports for different users. From the outset, UNFF stressed the need for monitoring systems that allowed data sharing and would streamline global forest reporting.

MAR needs to be straightforward and to support systematic collection and analysis of forest data, that will generate national statistics. Sound data and information are fundamental for a country's forest protection, restoration, and sustainable management, as well as for UN agreements and conventions that relate to forests, including the Sustainable Development Goals (SDG), such as SDG 15. MAR offers also the opportunity for harmonization with National Forest Programmes, Forest Law Enforcement, the Governance and Trade (FLEGT) Action Plan, and REDD+ initiatives for Reducing Emissions from Deforestation and Forest Degradation in developing countries. MAR aligns national forest policies with up-to-date, reliable, transparent and accessible information.

As part of the policy cycle, MAR supports strategic planning and policymaking by showing the links between policy interventions, outcomes, and impacts. This legitimizes the allocation and use of public resources and enhances policy effectiveness. A good MAR framework enables countries to respond to multi-purpose national needs for forest information. Assessing and reporting SFM progress require monitoring at differing levels, with periodic aggregation at larger scales to show where corrective action may be needed. MAR helps forest and land managers to improve management plans and to see the effects of forest management practices. Lastly, MAR informs the public about forest health and sustainable forest management.

WHAT ARE THE DIFFERENCES BETWEEN MONITORING, ASSESSMENT AND REPORTING?

MAR covers the three key tasks of UNFF to implement the proposals for action that progresses SFM: monitoring, assessment, and reporting. The three components of MAR are synergistic and tightly connected.

Monitoring, by itself, is not enough to assess progress towards SFM. Monitoring means periodic quantitative measurements of a specific parameter or qualitative collection of additional relevant information.

Assessment is the analysis and synthesis of information, that allows interpretation of the data for every indicator, to express progress towards SFM. Assessment specifies the information that needs to be gathered, focusing on situations and trends, for example, how SFM activity can change forest condition, such as increased growing stock or protected biodiversity. Assessment can provide a more balanced and integrated interpretation of the performance of different forest components.

Reporting is necessary to pass on assessment results for policy, planning, and management actions to achieve progress towards sustainable forest management (FAO, 2011). This is vital for the follow-up of forest management activities to inform about interventions to optimize SFM impact. It is also important that MAR for SFM should use easily comprehensible reports and be action-oriented at international and national level.

MAR links these three components into a coherent and efficient system for data collection, for the development of indicators, assessments and information to support decision-making and progress towards sustainable forest management.

WHAT ROLE DO C&I HAVE IN MAR?

Assessing how sustainable forest management might be is immensely challenging. C&I have increased focus on improved forest management practices for healthier, more diverse and productive forests, reflecting an ecosystem approach to SFM (FAO, 2000). Structured, evidence-based information is needed to identify forest sector trends, measure the effects of forest management interventions, and evaluate progress towards sustainable forest management in a country, region, or at global level.

C&I for SFM were developed as tools for monitoring, assessment and reporting to demonstrate progress towards sustainable forest management. Providing information on aspects related to SFM for decision-making is therefore a vital function of C&I for SFM. They have mainly been used at a national level but are becoming increasingly useful also at field-unit level.

Interest in C&I for SFM has increased, recognizing their value for monitoring, assessing and reporting forest condition and trends under the SDGs and other global goals and challenges that relate to forests. C&I ensure that monitoring covers the complexity of forests, including the seven thematic elements of SFM (United Nations, 2007). They measure forest status and changes in quantitative, qualitative and descriptive terms. Having defined goals and possibly also targets or thresholds helps to structure decision-making in national forest policy processes.

Widespread use of C&I in MAR supports coordination and collaboration (a) within regional forest processes, (b) between regional forest processes and (c) between regional forest processes and other forest indicator initiatives (FAO, 2003).

Sharing experience among countries and related stakeholders helps identify actions that support SFM. Likewise, comparability between national and international initiatives is vital for delivering coherent messages

and reducing the reporting burden. C&I provide an international reference, and a shared understanding across countries of what SFM means. Sharing information through regional and international forest processes has set more focus on the need to simplify and harmonize the used concepts, terms and definitions. This has fostered harmonization, for example in reporting to the FAO forest resource assessments, or in developing common reporting guidelines (including terms and definitions) like the ones of FAO FRA and the pan-European reporting.

ACTORS INVOLVED IN MONITORING, ASSESSMENT AND REPORTING

For over 25 years, national and international actors have been involved in developing C&I for SFM (Linser et al., 2018a). MAR draws upon many sources of data and information, including remote sensing, field observation, maps, reports and other documents, and expert information. Data on diverse forest attributes are recorded, stored and processed, serving indicators to obtain policy-relevant information. Therefore, the range of actors includes forest owners and managers, government decision-makers, forest industry, forest associations, private sector companies, forest organizations, environmental organizations, and research and education facilities. Involving forest research, education and training institutions ensures that MAR is updated using the latest technology and approaches. Engaging multiple actors may raise awareness, foster information exchange and dissemination and facilitate coordinated inputs. Successful MAR examples demonstrate the importance of broad stakeholder participation, consensus and acceptance to achieving sustainable forest management. Collaboration between actors and institutions, including UN structures such as the Collaborative Partnership on Forests and other international and regional organizations, institutions and instruments, non-governmental organizations and other stakeholders, has supported the global forest goals and targets at all levels (Rayner et al., 2010).

INTERNATIONAL FOREST PROCESSES FOR WHICH MONITORING, ASSESSMENT AND REPORTING ARE IMPORTANT

There is strong international commitment to providing information for monitoring progress towards SFM in a comprehensive, efficient, timely and meaningful way. At least eleven regional and international forest processes use MAR for forests and forestry (Linser et al., 2018b). They undertake periodic surveys, collect and analyze data, and disseminate information on sustainable forest management. 171 countries take part in at least one of the processes, aimed at better comprehension and implementation of SFM (Linser et al., 2018a). Many international agencies help countries to implement C&I for SFM within the UN system, as well as for many non-UN organizations.

The similarity among these countries and organizations is striking and is because they all use MAR structured around a set of C&I for SFM that cover a broad range of forest benefits. Processes differ in structure and content, such as the number of national-level criteria, and level of assessment considered. Participating countries commented on the lack of coordination between the various C&I for SFM processes, as well as a lack of harmonized definitions. This has contributed to unclear messages, and an unnecessarily high reporting burden.

The Collaborative Partnership on Forests (CPF) developed a Global Core Set of Forest-related Indicators (GCS) to simplify and harmonize the various concepts and terminology. These help to measure progress towards sustainable forest management within SDG 15, and to implement the Forest Instrument, the UN Strategic Plan for Forests, and the 26 associated targets. It also aids other internationally agreed goals on forests in other instruments, notably by meeting the forest-related reporting needs of the Rio conventions.

HOW CAN NATIONAL C&I FOR SFM BE USED IN MAR?

C&I are an increasingly common policy tool to implement SFM and define clear priorities and targets. As national-level assessment tools, the C&I for SFM are the basis for reporting on a country's forests, public and private, natural and plantation.

The agreed indicators in most C&I for SFM sets are adequate for a basic understanding of many forest values and the country's progress towards SFM. They guide the national monitoring system set-up on which data to collect. The reporting forms' structure and format give guidance on the assessments needed to understand national forest trends and progress towards SFM. The monitoring structure is also applicable at sub-national, and even local and forest management unit levels. It gives guidance on forest management practice and changes, and helps implement forest certification principles, standards and indicators.

The application of the C&I for SFM framework can support national policies and strategies that may be linked with other sectors like rural development, environment, climate change and energy. As such, the C&I for SFM can contribute to cross-sectoral and cross-institutional dialogue on sustainable development and support national planning processes

WHAT ARE THE STEPS TO DEVELOP A MAR IN A COUNTRY?

There is no single best way for developing MAR on SFM. However, in 2009, 12 countries in the Asia Pacific region developed [globally harmonized forest-related national MAR](#) which is a useful example. The guidelines and the structure of the database for monitoring, assessment and reporting on SFM could be applied in any other region.

The initial phases of MAR set-up include development and implementation. The development phase focuses on international activities. Examples include linkages with forest-related processes and development of a globally harmonized framework, or the development of technical guidelines, basic database structure, and information-sharing networks for MAR. All these ensure that MAR are linked and harmonized with processes, protocols and reports at the international level. This will help to develop national forest policies and plans, using the information supplied by MAR. This phase usually involves close collaboration with FAO.

The implementation phase is conducted at country level. It includes implementing a framework and guidelines, as well as database structure and information networks. An essential early step is to set up a network of national focal points for national, regional and international monitoring and data collection. This ensures the national MAR system is efficient and will contribute to SFM. It also involves awareness-raising across major stakeholder groups and sectors, as well as actors.

Further MAR development may differ broadly between countries. Issues and measures can be identified and discussed at sub regional and national workshops to:

- Harmonize definitions.
- Identify approaches for data compilation and review.
- Build capacity by providing primary methodologies for forest policy review and linking it with the national planning processes.

- Establish a national and regional database of internationally harmonized elements or variables that facilitate description of the status and assessment of trends in national forest management and policies.
- Develop an information-sharing network of regional and national focal points of forest-related agencies and processes, project focal points and relevant stakeholders.

Other models could be used to develop similar frameworks and guidelines, for example the triangular model of ecological, economic and social dimensions of sustainability and the Driver-Pressure-State-Impact-Response (DPSIR) model. Any approach must be flexible, and match country capacity for forest information and management systems. A country's MAR essential elements must also maintain international compatibility with regional and international MAR frameworks.

Monitoring and reporting remain a challenge for countries that lack human and financial capacity, or adequate means/methods to carry out a forest inventory. Many countries need to develop standard methods to gather information about non-timber forest benefits, socio-economic indicators, and coherent data on financing SFM. Many countries also need guidelines on collecting timely, comparable and consistent forest information (see COFO, 2012).

The FAO has supported member countries with national forest monitoring for over 70 years. Their Voluntary Guidelines for National Forest Monitoring show how countries can build multipurpose MAR for SFM, supporting national decision-making and international reporting. The UNECE carried out regional studies and developed guidelines to support C&I for SFM (UNECE 2019 a and b).

Regular updating of MAR generates innovation by identifying new ways to fast-track technical capacity development and improve technology transfer. Systems for earth observation, data access, processing, forest monitoring analysis, and open-source software, enable accurate, efficient, and cost-effective forest monitoring, assessment and reporting.

POLICY IMPLICATIONS

The set-up of a national MAR system facilitates the use of C&I to monitor and assess national trends in forest conditions and management in a number of ways.

Further promotion of C&I and MAR relies on increasing political commitment.

Continuous technical support and guidance should be offered to countries to apply C&I effectively, and to encourage non-participating countries to use them.

The same is true for strengthening concepts and definitions, and supporting the C&I processes.

The development of C&I should innovatively optimize resource use and simplify application.

CONCLUSIONS

Monitoring, assessment and reporting naturally occur in local, national and international systems, demanded by legislative, managerial rules or participation in international arrangements. However, the way they are carried out and organized vary greatly among countries. An organized monitoring, assessing and reporting system for SFM may substantially increase efficiency and effectiveness of related work, as well as consistency and credibility of processed information. Components of such a system includes:

1. Clearly expressed goals, and a set of criteria and indicators to measure and track progress and performance.
2. A set of guidelines for all responsible actors and implied stakeholders to inform and report to each other.
3. An opportunity for responsible actors to meet periodically to coordinate action and review progress.

This policy brief was developed as a part of the United Nations Development Account (UNDA) project Accountability Systems for Sustainable Forest Management in the Caucasus and Central Asia

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ANNEX 1: ORGANIZATIONS THAT CAN HELP WITH MAR

The FAO offers information on MAR on their website under “[Assessment and monitoring](#)”. Particularly relevant are:

- Information on the [Global Forest Resource Assessment](#), including the recent FRA-2020
- Information on [forest monitoring and assessment](#). This page is also linked to the [Voluntary Guidelines for National Forest Monitoring](#)
- Information on [Criteria and Indicators for Sustainable Forest Management](#)
- [Practical guidelines for the monitoring, assessment, and reporting](#) on national-level criteria and indicators have been developed for different regions (e.g. for the dry forests of Asia)
- The development of [MAR for the Asia and Pacific Region](#)
- The Technical Synthesis Report on “[Strengthening Monitoring, Assessment and Reporting on Sustainable Forest Management](#)” (GCP/INT/988/JPN)”
- National Forest Monitoring and Assessment – [Manual for integrated field data collection](#)
- The [Open Foris](#) is an FAO-led initiative to develop, share and support specialized software tools required by countries and institutions to implement multi-purpose forest inventories

The [joint UNECE/FAO Forestry and Timber Section](#) supports developing evidence-based policies for sustainable forest management and communicates about the many products and ecosystem services provided to society, while assisting countries of the region to monitor and manage forests.

The UNECE/FAO and the UNDA have given technical assistance to countries in Eastern and South-Eastern Europe, the Caucasus and Central Asia, this capacity-building supports sustainable forest management, data collection, monitoring and analysis and promotes the engagement of national experts in these regions. The outcomes of regional workshops and reports are available on [the UNECE project website](#).

ANNEX 2: REFERENCES CITED - FOR MORE INFORMATION ON MAR

COFO 2012. See list of meeting documents of the [Committee on Forestry 2012](#)

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