Measuring forest degradation

Unasylva closes the International Year of Forests 2011 with a selection of papers initially developed as part of a special study FAO and its partners conducted on forest degradation.

Although it is more complex to define and to measure, forest degradation is a serious problem comparable in dimension to deforestation. It has adverse impacts on the forest ecosystem and on the goods and services it provides. Many of these goods and services are linked to human well-being, and some to the global carbon and water and climate cycles – and thus to life on Earth.

Countries need information on forest degradation. They need to be able to monitor changes happening in forests. They need to know where forest degradation is taking place, what causes it and how serious the impacts are, in order to prioritize the allocation of scarce human and financial resources for the prevention of degradation and the restoration and rehabilitation of degraded forests.

The goal of the study was to come up with a reasonable set of indicators that can be easily measured and that provide countries with information on the state of forest degradation. It began as a special study under the umbrella of the Global Forest Resources Assessment (FRA) 2010, but later evolved into a multi-partner initiative led by members of the Collaborative Partnership on Forests (CPF) in collaboration with other partners including countries, the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) and the Global Partnership on Forest Landscape Restoration.

A key output was a document – "Assessing forest degradation – towards the development of globally applicable guidelines". This working paper is intended to provide relevant agencies and other stakeholders with direction on measuring forest degradation. It can be used for the development of programmes for assessing forest degradation, and should be regarded as a precursor to the development of comprehensive globally applicable guidelines in the future.

The study recognized that forest degradation means different things to different people, depending on their point of view or interest in forests, and ways of measuring forest degradation had to be determined to reflect those differing points of view. The articles presented in this issue of *Unasylva* demonstrate the breadth of expertise and variety of perceptions among those invited to participate in the study.

An overview, by M. Simula and E. Mansur, lays out the issue of forest degradation and introduces some considerations in assessing it, including spatial and temporal scales, and the establishment of baseline data against which measurements can be compared.

L. Laestadius *et al*. invite readers to take a satellite's-eye view of forest degradation. A method for gathering information on forest degradation is introduced, showing that expert analysis of satellite imagery alone can provide information on the extent of human disturbance across large forest landscapes.

Methods recommended for measuring forest degradation will often include both analysis of remote sensing images and validation on the basis of field surveys. Yet one or the other is often a challenge, especially for developing countries. M. Herold *et al*. propose that countries combine analysis of historical remote sensing images with consistent, current field surveys to fill in data gaps.

A measure of forest degradation may be in terms of loss of biodiversity, forest health, productive or protective potential or aesthetic value. The next two articles explore the issue from an ecosystem perspective. I. Thompson describes the resilience of forest ecosystems, and how forests may lose their resilience over time, if sufficient attention is not paid to maintaining biodiversity and avoiding thresholds, or tipping points. K.P. Acharya, R.B. Dangi and M. Acharya focus on Nepal, which has a rich tradition of some sixty years of field surveys. Among the thematic elements of sustainable forest management that have been addressed by these surveys, forest ecosystem services has rarely been considered as a way of valuing degradation.

The final two articles also rely heavily on ground-based analysis. C.L. Meneses-Tovar focuses on forest health, describing an effort in Mexico to apply an index to satellite images and then to overlay it on data from field analysis, in order to measure change in "green". R. Nasi and N. van Vliet discuss measuring and monitoring wildlife in Central African logging concessions. From walking transects to counting dung pellets, readers are invited to consider how wildlife is monitored to ensure effective management measures can be developed.

Shorter articles present: a major study that analysed remote sensing imagery to understand forest-cover and land-use change; and a way to use such data to map the myriad opportunities for forest landscape restoration.

And so we hope to end from the perspective that the future holds tremendous opportunity. The special study envisioned that building the capacity of countries to assess, monitor and report on forest degradation can lead to action to reduce current rates of degradation – and to effective restoration efforts. Where it can be done, restoring degraded forests not only improves the amount and quality of the many goods and services they provide, it also enhances and improves their resilience and thus the capacity to withstand natural and human-induced changes or disturbances, including those caused by climate change.