

# Towards development of a report on the state of the world's forest genetic resources

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## The report will provide the basis

for developing an action framework for genetic management at national, regional, eco-regional and global levels, with due attention to the integration of conservation concerns in broader development plans, such as national forest programmes and poverty reduction strategies. The review will cover the status and trends of priority species and ecosystems on the basis of country-derived information related to their conservation in protected areas; the incorporation of genetic considerations in natural and planted forest management; and the incorporation of such considerations in tree improvement strategies.



A forest of *Araucaria columnaris* in southern New Caledonia.  
Photo J.-M. Sarrailh.

## RÉSUMÉ

### VERS L'ÉLABORATION D'UN RAPPORT SUR L'ÉTAT DES RESSOURCES GÉNÉTIQUES FORESTIÈRES DU MONDE

La disponibilité de données fiables est indispensable pour la conservation efficace et la gestion durable des ressources génétiques forestières. À ce jour, il n'existe aucune vision globale de l'état et de l'évolution de ces ressources, ni d'estimations fiables quant aux taux et aux causes de leur perte ou leur dégradation. En 2007, la Fao a été mandatée par ses pays membres pour préparer un rapport sur l'état des ressources forestières du monde. Ce rapport vise à établir les bases permettant d'élaborer un cadre d'action pour la gestion des ressources génétiques aux niveaux national, régional, éco-régional et global. Cette gestion devra accorder l'attention qui s'impose à l'intégration des problématiques de conservation dans les plans de développement plus globaux, comme les plans forestiers nationaux et les stratégies de réduction de la pauvreté. L'état et l'évolution des espèces et écosystèmes prioritaires feront l'objet de bilans fondés sur les informations nationales concernant la conservation en aires protégées, l'intégration des questions liées à la génétique dans la gestion des forêts naturelles et des plantations forestières, et la prise en compte de ces questions dans les stratégies d'amélioration des arbres forestiers. Ces efforts seront intégrés dans le cadre du processus de mise à jour régulière de l'évaluation des ressources forestières mondiales coordonnée par la Fao. La préparation du rapport sur l'état des forêts dans le monde ainsi que l'élaboration et la mise en œuvre du plan d'action seront des efforts conjoints ; les tâches seront partagées entre la Fao, les partenaires internationaux et les pays concernés. L'article décrit les principales étapes qui permettront de réaliser ces objectifs.

**Mots-clés :** ressource génétique forestière, gestion des ressources génétiques, conservation des écosystèmes, évaluation des ressources forestières, coopération internationale.

## ABSTRACT

### TOWARDS DEVELOPMENT OF A REPORT ON THE STATE OF THE WORLD'S FOREST GENETIC RESOURCES

The availability of reliable data is a necessary basis for efficient conservation and sustainable management of forest genetic resources. At present, no overall picture exists of status and trends in these resources, and reliable estimates of the rate and causes of their loss or degradation are largely lacking. In 2007, FAO was entrusted by its member countries with the task of preparing a State of the World Report on forest genetic resources. The report will underpin the development of a framework for action to enhance genetic management at national, regional, eco-regional and global levels, with due attention to the integration of conservation concerns in broader development plans, such as national forest programmes and poverty reduction strategies. The review will cover status and trends in priority species and ecosystems on the basis of country-derived information related to their conservation in protected areas, the incorporation of genetic considerations in natural and planted forest management and the incorporation of such considerations in tree improvement strategies. Efforts will be mainstreamed with the process leading to the regular up-dating of the global forest resources assessments coordinated by FAO. The preparation of the State of the World Report and the development and implementation of the action plan will be a joint undertaking in which tasks will be shared between FAO, international partners and the countries concerned. This article outlines steps needed to achieve these goals.

**Keywords:** forest genetic resource, genetic management, ecosystem conservation, forest resources assessment, international cooperation.

## RESUMEN

### HACIA LA ELABORACIÓN DE UN INFORME SOBRE EL ESTADO DE LOS RECURSOS GÉNÉTICOS FORESTALES DEL MUNDO

Es indispensable contar con datos fiables para una conservación eficaz y una gestión sostenible de los recursos genéticos forestales. Por ahora, no se dispone de un panorama global del estado y evolución de dichos recursos; ni de estimaciones fiables referidas a porcentajes y causas de pérdidas o de degradación. En 2007, los países miembros de la FAO encomendaron a este organismo la preparación de un informe sobre el estado de los recursos forestales del mundo. Este informe aspira a sentar las bases que permitan elaborar un marco de acción para la gestión de los recursos genéticos a nivel nacional, regional, ecorregional y global. Esta gestión deberá hacer especial hincapié en la integración de los problemas de conservación en planes de desarrollo más globales, como los planes forestales nacionales y las estrategias de reducción de la pobreza. El estado y la evolución de las especies y ecosistemas prioritarios serán objeto de balances basados en las informaciones nacionales relativas a la conservación en zonas protegidas, en la integración de las cuestiones vinculadas a la genética en el manejo de bosques naturales y plantaciones forestales, y en la consideración de dichas cuestiones dentro de las estrategias de mejoramiento genético forestal. Estos esfuerzos se integrarán en el marco del proceso regular de actualización de la evaluación de los recursos forestales mundiales coordinado por la FAO. La preparación del informe sobre el estado de los bosques en el mundo, así como la elaboración y aplicación del plan de acción, serán desarrollados conjuntamente, compartiendo las tareas, por la FAO, los socios internacionales y los países interesados. El artículo describe las principales etapas que permitirán realizar estos objetivos.

**Palabras clave:** recurso genético forestal, gestión de recursos genéticos, conservación de ecosistemas, evaluación de los recursos forestales, cooperación internacional.

## Background

**Forest biological diversity** denotes the variability among living organisms found in forest ecosystems and the ecological processes of which they are part. It includes variation at landscape, ecosystem, species, population, individual and molecular levels of biotic organisation.

**Genetic variation**, at the levels of species, populations, individuals and genes, is an important component of biological diversity, and provides the basis for evolution and the adaptation of species to changes in the environment. The availability of genetic variation is also essential for selection and breeding to meet present and future human needs.

**Forest genetic resources**, in the present context, refers to the actual or potential value of the hereditary variation contained in forest trees and shrubs.

Through its forest genetic resources programme, FAO provides support to national governments and other stakeholders in institutional strengthening and capacity building, and in the development and implementation of genetic conservation strategies linked to wider issues of natural and planted forest management, biological diversity conservation and rural development. FAO actively sustains and supports networking and institutional twinning, and acts as "honest broker" in discussions on the use of new and conventional tree breeding technologies and issues concerning access to and exchange of forest germplasm. Related information is disseminated widely, using a range of communication tools. In its work, FAO collaborates with a large number of international partners, and promotes harmonisation of activities at regional and international levels.

At its Eleventh Session in June 2007, the inter-Governmental FAO Commission on Genetic Resources for Food and Agriculture reviewed sectoral and cross-sectoral issues. These included crop, animal, forest, aquatic and microbial genetic resources (FAO, 2007). With regard to forest genetic



The Mont Panié forest in New Caledonia.  
Photo M. Litaudon.

resources, the Commission took note of the present status and needs in the sector (FAO, 2007 a, b, c), and noted the importance of forest genetic resources for food security, poverty alleviation, environmental sustainability and economic and social advancement. It acknowledged the historic role and comparative advantages of FAO in this field and underscored the importance of the work of the Panel of Experts on Forest Gene Resources. In view of the urgency to conserve, manage and sustainably utilise forest genetic resources, the Commission approved the inclusion of forest genetic resources in its Multi-Year Programme of Work. It requested the Secretariat to prepare a scoping paper on the State of the World's Forest Genetic Resources for review at its Twelfth Session in 2009, in which existing information sources should be analysed, main gaps in coverage identified, and details of a proposed work programme and budget outlined. A State of the World Report should, subsequently, be prepared and presented to the Fourteenth Session of the Commission in 2013.

The State of the World Report will provide the basis for developing a framework for action at national, regional, eco-regional and global lev-

els. It was noted that the elaboration of such a framework did not imply top-down delivery of conservation policy nor did it call for one single model for conservation and genetic management, as the most appropriate models will vary according to local biological, social and economic environments, institutional realities and national needs and priorities.

The Commission recommended that the Committee on Forestry (COFO) and the FAO Regional Forestry Commissions be fully involved in the preparation of State of the World Report. It endorsed the recommendation of the 18th Session of COFO that work be undertaken in close collaboration with international partners, such as Bioversity International<sup>1</sup>, and in synergy with other on-going regional and global programmes, such as those carried out within the framework of the Convention on Biological Diversity (FAO, 2007 d)<sup>2</sup>.

<sup>1</sup> Previously known as the International Plant Genetic Resources Institute, IPGRI (see: [www.bioversityinternational.org/](http://www.bioversityinternational.org/)).

<sup>2</sup> For an overview of international agencies, institutions and mechanisms involved in various aspects of forest biological diversity and forest genetic resources, see FAO (2007 c), Table 1, p. 11-14; and Appendix 1.

## The State of the World Report

As noted above, FAO has been entrusted by its 193 member countries with the task of preparing a State of the World Report, which will serve as a basis for a global plan of action for the conservation and sustainable use of forest genetic resources. Activities will be carried out in close collaboration with international partners, with due regard to the mandates and comparative advantages of each agency. The work will build on country-derived information and priorities. This effort will thus be a joint undertaking in which tasks are shared between FAO, international partners and countries concerned.

The State of the World Report will focus on the management and sustainable use of forest tree and shrub genetic resources of actual or potential value for human well-being. While the report will be based on country-derived information on status and national needs and priorities, it will also review and make proposals for wider policy and action frameworks at eco-regional, regional and global levels, as such frameworks will help strengthen the impact of genetic management in individual countries, and can help draw attention to issues of regional and global concern which might inadvertently be overlooked in national forest genetic resources strategies. Full use will be made of complementarities and institutional strengths in participating countries when planning regional and global collaboration, as this will help avoid duplication of effort and wasteful overlaps, as well as helping to ensure that the best possible use is made of scarce resources.

Technically, activities will be reviewed on the basis of:

- conservation of forest biological diversity and forest genetic resources in protected areas;
- incorporation of genetic considerations in natural and planted forest management;
- incorporation of such considerations in tree improvement strategies.



A *Weinmannia tinctoria*, considered as an endangered species. La Réunion.  
 Photo J.-M. Sarrailh.

Due attention will be given to the need to back up action by strong institutions at the local and national levels, not just those involved with conservation and forestry, but also those in other related sectors.

Reliable information on status and trends are fundamental to monitoring forest biological diversity and managing forest genetic resources. When requesting FAO to embark on the preparation of a State of the World Report, the Commission recognised that the present lack of reliable data is a serious limitation to sound decision-making and wise management of forest genetic resources.

On the other hand, it was noted that increased information is becoming available on status and trends in the forests of the world (FAO, 2007 e). The Global Forest Resources Assessment (FRA) 2005 analysed data on more than 40 variables for

three points in time: 1990, 2000 and 2005 (FAO, 2006 a). The variables which were considered to be of particular relevance to forest biological diversity included forest area, area and percentage of primary forests, area and percentage of forests designated for biological diversity conservation (mainly national parks and other protected areas), tree species (growing stock of the 10 most common species), number of native species and endangered tree species. Information on these will provide an important starting point for assessing and monitoring forest biological diversity and managing forest genetic resources. The forthcoming State of the World Report should therefore draw upon FRA data, and efforts to prepare the report should be mainstreamed with the global forest resources assessment process<sup>3</sup>.

<sup>3</sup> The Global Forest Resources Assessment is published every five years. The latest assessment, published in 2006, related to the reference year 2005; the next assessment will be released in 2010.

However, as stressed in the Final Report of FRA 2005, and as discussed in some detail by FAO (2007 c), most quantitative and qualitative variables commonly recorded in forest inventories cannot be used, given current knowledge, to directly determine status and trends in forest genetic resources at the level of tree species, provenances, populations and genes, all of which will be addressed in the State of the World Report. The FRA Report noted, for example, that the two tropical countries with the highest percentage of primary forests were Singapore and Brunei Darussalam, both with 100% (FAO, 2006 a). However, with regard to conservation, these two countries are very different. The “percentage of primary forest” variable obviously cannot be used as a surrogate measure for the status of forest genetic resources without placing the information in a broader, historical and geopolitical context. With respect to the number of native tree species, which is an important general variable recorded in FRA 2005, the FRA 2005 Final Report (*op. cit.*) rightly noted that the fact that boreal zone countries (or other countries or regions characterised by environmental conditions that are marginal for plant growth) have relatively few native tree species does not point to shortcomings in national conservation programmes but is due to ecological conditions in these areas. As far as endangered tree species are concerned, the FRA analysis was based mainly on information in national “Red Data Books”, which report on status at species level. This variable, too, is of limited usefulness in assessing overall conservation status and trends, as it is possible to conserve a species while, at the same time, genetically distinct provenances, populations, genes or valuable gene complexes are lost.

In view of the above, the definition of useful variables to assess the status of biological diversity at the various levels on which it occurs, and the development and application of

relevant, scientifically sound and easily measurable genetic indicators to monitor changes over time, are urgently needed. Indicators defined should complement, and at the same time be fully integrated with, those being used in other fields and sectors, notably criteria and indicators for sustainable forest management (see FAO 2002, 2002 a for information on forest genetic resources indicators; and FAO 2001 for an overview of criteria and indicators for sustainable forest management).

In order to develop mutually compatible national action plans which can be aggregated at regional, eco-regional and global levels, there is also an urgent need to agree on common principles and mechanisms for setting priorities among ecosystems, species and genetic resources to be targeted for conservation and genetic management.

The integration of conservation concerns and genetic management in broader local and national development plans can help ensure sustain-



*Montrouziera cauliflora* (“houp”), in a forest in New Caledonia.  
Photo J.-M. Sarrailh.



Regenerating Argan trees in a deferred area reserve near Agadir in Morocco.  
 Photo A. Galiana.

ability and long-term success. Possibilities for such integration should therefore be examined in the State of the World Report. Development plans which foster harmonised action between sectors and cooperation among national agencies dealing with these include, notably, in this context, national forest programmes and local and national poverty reduction strategies. Links should also be forged to efforts by countries to meet the Millennium Development Goals (MDGs), notably MDG 1 (“Eradicate Extreme Poverty and Hunger”) and MDG 7 (“Ensure Environmental Sustainability”), to which forestry can make substantial contributions (FAO, 2006).

In spite of the many gaps in information identified above, the preparation of the State of the World Report will not start from scratch.

Since the issue was first raised at the 13th Session of the Committee on Forestry in 1997 (FAO, 1997, 1997 a), FAO and its international partners have strengthened support to collaborating institutions, scientists and practitioners in the collection, analysis and publication of information on forest genetic resources. As evidenced in the list of references to the present article, FAO and partners have also called upon a number of authoritative external experts and institutions to help analyse and synthesise available information with a view to identifying gaps and proposing strategies for future action.

Information has been, furthermore, generated in a series of forest genetic resources workshops at regional, sub-regional and eco-regional levels which have been organised since the mid 1990s with

the participation of some 50 countries in seven regions. Following driven workshops, a large number of national reports became available on status, trends, priorities and needs in the management of forest genetic resources, in which priority setting and recommendations for action were based on similar and clearly defined principles and methodologies<sup>4</sup>. Such information has, over the years, helped support national and regional forest genetic resources programmes. It will also provide essential inputs to the State of the World Report. Fostering the organisation of forest genetic resources workshops should be continued with a view to expanding the coverage of countries and regions.

Some additional sources of information, and networks which can be expected to generate relevant and up-to-date information for incorpora-

<sup>4</sup> See bibliography at the end of Section 10 of FAO (2007 c) for references and links to information on these workshops.

**Box 1****Availability of information on forest biological diversity and forest tree and shrub genetic resources**

The purpose of the notes below is to highlight a number of relevant sources of information on forest biological diversity and genetic resources and to provide corresponding links, for easy reference. The list is not all-inclusive. For a more comprehensive overview, see FAO (2007 c). Information sources marked with an asterisk (\*), are available in English, French, Spanish, sometimes also in Arabic and Chinese.

**Forest biological diversity**

- The Convention on Biological Diversity (CBD)\*: [www.cbd.int/default.shtml](http://www.cbd.int/default.shtml);
- The FAO Inter-Departmental Group on Biological Diversity in Food and Agriculture\*: [www.fao.org/biodiversity/index.asp](http://www.fao.org/biodiversity/index.asp).

**Forest Genetic Resources**

The FAO Forest Genetic Resources Homepages host information on various aspects of the management of forest genetic resources\*, see: [www.fao.org/forestry/site/fgr/en/](http://www.fao.org/forestry/site/fgr/en/). This includes, *inter alia*:

- Information generated within the framework of the Panel of Experts on Forest Gene Resources\*: [www.fao.org/forestry/site/genepanel/en/](http://www.fao.org/forestry/site/genepanel/en/). The work of the Panel includes regularly up-dated lists of species and provenances of high global, regional and/or national priority for genetic management: [www.fao.org/forestry/site/41916/en/](http://www.fao.org/forestry/site/41916/en/). It also includes regional updates on status, trends, priorities and needs, see BASKARAN *et al.*, 2002: [www.fao.org/DOCREP/005/AC646E/AC646E00.HTM](http://www.fao.org/DOCREP/005/AC646E/AC646E00.HTM); and BASKARAN *et al.*, 2004: [www.fao.org/forestry/webview/media?mediaId=12131&langId=1](http://www.fao.org/forestry/webview/media?mediaId=12131&langId=1)
- National and regional level information prepared within the framework of country-driven regional, sub-regional and eco-regional workshops on forest genetic resources supported by FAO and international partners. Related information has been published as FAO Forest Genetic Resources Working Papers, see: [www.fao.org/forestry/site/41119/en/](http://www.fao.org/forestry/site/41119/en/) (click on the heading “Working Papers” on the left-hand menu). Summarised information is available also in Section 10 of FAO (2007 c).
- Information generated within the framework of regional forest genetic resources networks such as those listed in Box 2.
- The FAO Forestry Database on Forest Genetic Resources, REFORGEN: [www.fao.org/forestry/reforgen/](http://www.fao.org/forestry/reforgen/). For a brief description of REFORGEN and other databases relevant to work on forest genetic resources, see Section 11 of FAO (2007 c).

**General information on forests and forest ecosystems**

Sources of regularly up-dated information include the Global Forest Resources Assessments\*: [www.fao.org/forestry/site/fra/en/](http://www.fao.org/forestry/site/fra/en/) and [www.fao.org/forestry/site/data/en/](http://www.fao.org/forestry/site/data/en/); and national forest programmes\*: [www.nfp-facility.org/home/en/](http://www.nfp-facility.org/home/en/).

In addition, general information of relevance can be found at the Homepages of the following, *inter alia*:

- Bioversity International (formerly known as IPGRI): [www.bioversityinternational.org/index.asp](http://www.bioversityinternational.org/index.asp). Bioversity is, “dedicated to research on the conservation and use of agricultural biodiversity”. A number of Bioversity-coordinated networks which deal with forest genetic resources are listed in Box 2.
- The World Agroforestry Center, ICRAF: [www.worldagroforestrycentre.org/](http://www.worldagroforestrycentre.org/). ICRAF deals with research on trees grown in agroforestry systems to, “generate knowledge on the complex role of trees in livelihoods and the environment”.
- The Center for International Forestry Research, CIFOR: [www.cifor.cgiar.org/](http://www.cifor.cgiar.org/). CIFOR focuses on research to underpin, “conserving forests and improving the livelihoods of people in the tropics”.
- The International Tropical Timber Organization, ITTO: [www.itto.or.jp/live/PageDisplayHandler?pageId=225](http://www.itto.or.jp/live/PageDisplayHandler?pageId=225). ITTO, “promotes the conservation and sustainable management, use and trade of tropical forest resources”.

tion into the State of the World Report, are listed in Boxes 1 and 2. See also FAO (2007 c) for a summary review of status and trends in the world’s forest genetic resources.

If resources permit, a number of thematic studies will be developed in the process of preparing the State of the World Report. These studies will explore links between forest genetic resource management and a number of key issues such as, for example, poverty reduction, climate change, bioenergy, and the place and role of conventional and new technologies in genetic conservation and tree breeding.

In line with the recommendations of the Panel of Experts on Forest Gene Resources (FAO, 2007 b) and the Commission on Genetic Resources for Food and Agriculture (FAO, 2007), existing information and data systems will be reviewed and adjusted, as necessary, to support management of the considerable amount of information to be assembled, assessed and made available to policy makers and other users in the forest genetic resources field. The Global Information System on Forest Genetic Resources, REFORGEN, coordinated by FAO since the early 1990s, will be highly relevant in this respect<sup>5</sup>. Information presently lodged in REFORGEN will be verified, and reliable mechanisms which allow continuing data up-dating will be further developed. The complementarity of REFORGEN with other already available or incipient data bases and information management systems will be ensured.

<sup>5</sup> See: [www.fao.org/forestry/reforgen/](http://www.fao.org/forestry/reforgen/)

**Box 2**
**Examples of regional collaborative networks in the management of forest genetic resources**
**Africa**

▪ The Sub-Saharan African Forest Genetic Resources Programme, SAFORGEN: [www.biodiversityinternational.org/Information\\_Sources/Networks/saforgen/index.asp](http://www.biodiversityinternational.org/Information_Sources/Networks/saforgen/index.asp)

**Americas**

- The Latin America Forest Genetic Resources Programme, LAFORGEN: [www.biodiversityinternational.org/Information\\_Sources/Networks/laforgen/index.asp](http://www.biodiversityinternational.org/Information_Sources/Networks/laforgen/index.asp)
- The International Cooperative for Tree Conservation and Domestication, CAMCORE (earlier known as the Central America and Mexico Coniferous Resources Cooperative): [www.camcore.org/](http://www.camcore.org/)
- The FAO North American Forest Commission Working Party on Forest Genetic Resources: [www.fs.fed.us/global/nafc/genetics/aboutus.htm](http://www.fs.fed.us/global/nafc/genetics/aboutus.htm)

**Asia-Pacific**

The Asia Pacific Forest Genetic Resources Programme, APFORGEN: [www.apforgen.org/](http://www.apforgen.org/)  
 The ASEAN Regional Biodiversity Conservation Programme of the ASEAN Regional Centre for Biodiversity Conservation: [www.arcbc.org.ph/about\\_ARCBC.htm](http://www.arcbc.org.ph/about_ARCBC.htm)  
 The Central Asia and Trans-Caucasus Network on Plant Genetic Resources, CATCN-PGR; and its Working Group on Forest Trees: [www.biodiversityinternational.org/Information\\_Sources/Networks/index.asp](http://www.biodiversityinternational.org/Information_Sources/Networks/index.asp)  
 The South Pacific Regional Initiative on Forest Genetic Resources, SPRIG: [www.fao.org/docrep/008/x9662e/X9662E11.htm](http://www.fao.org/docrep/008/x9662e/X9662E11.htm)

**Europe**

The European Forest Genetic Resources Programme, EUFORGEN: [www.biodiversityinternational.org/networks/euforgen/](http://www.biodiversityinternational.org/networks/euforgen/)

**General**

The International Union of Forest Research Organizations, IUFRO, promotes global cooperation in forest-related research through networking of research institutions and scientists, and through the dissemination of scientific information. Division 2 (Physiology and Genetics) and, more specifically, Working Party 2.04.01 (Population, ecological and conservation genetics); and the IUFRO Task Force on Endangered Species and Nature Conservation, are involved in a number of relevant activities and programmes (see IUFRO Structure and Office Holders: [www.iufro.org/who-is-who/](http://www.iufro.org/who-is-who/) for contacts and further information). Regional Chapters of IUFRO include the Asia Pacific Association of Forestry Research Institutions, APAFRI: [www.apafri.org/](http://www.apafri.org/); and the North-East Asian Forest Forum, NEAFF: [www.iufro.org/discover/regions/northeast-asia/](http://www.iufro.org/discover/regions/northeast-asia/). Collaborative networks are active also in other regions, see: [www.iufro.org/discover/regions/](http://www.iufro.org/discover/regions/)

**Epilogue**
**Quote**

Forests are the epitome of diversity. Present efforts in forest management and conservation often reflect values of dominant economic powers or a preservationist counter-culture, neither of which brings any higher level of justice to the people affected or concerned. It is our obligation not to abuse this complex system through ignorance, and to avoid management which would simplify forests to manufacturing factories, or attempt to restore or preserve a world that never existed. There is a need to forcefully stress the evolutionary interdependence between forests and humans and the need to focus on the issue of *how* to manage forest ecosystems and genetic resources, rather than *whether* to manage them.

**Unquote**

Extracted from: NAMKOONG, GENE (2001). Forest Genetics: patterns and complexity. *Can. J. For. Res.*, 31: 623-632. See: [pubs.nrc-cnrc.gc.ca/cgi-bin/rp/rp2\\_abst\\_e?cjfr\\_x00-166\\_31\\_ns\\_nf\\_cjfr](http://pubs.nrc-cnrc.gc.ca/cgi-bin/rp/rp2_abst_e?cjfr_x00-166_31_ns_nf_cjfr)

**Final remarks**

There are many ways of deriving value from forest ecosystems and from their component parts. These include the supply of goods and services and the provision of environmental and life-support values. It is important to ensure that valuable genetic resources are not lost or degraded and that they are further developed to meet present-day and future needs. This can be achieved through the active management of these resources which, at times, may also include non-intervention (IPGRI, FAO, DFSC, 2001, 2004, 2004 a).

The overall goal of the management of forest genetic resources is to help ensure that forest biological diversity, at all levels, is conserved and utilised sustainably to support local and national development, including food security, poverty alleviation, environmental conservation, economic and social advancement and the maintenance of cultural and spiritual values. The key to success lies in the development of programmes which harmonise conservation and sustainable resource use within a mosaic of land use options. Efforts must be accompanied by regular monitoring to ensure that progress is being achieved in reaching stated objectives using the strategies adopted.

The availability of reliable data on status and trends is a necessary basis for efficient conservation and management of forest genetic resources. At present, no global picture exists of status and trends in forest genetic diversity, and reliable estimates of the rate and causes of loss or degradation at local, national, regional and global levels are largely lacking. There is an urgent need to improve available data and to clarify a number of scientific and technical issues on which a global assessment can be based. This includes agreement on general principles for setting priorities for species, provenances and operations, and the definition of forest biological diversity and genetic indicators.



## References

In the light of established needs and gaps in information, the preparation of a report on the State of the World's Forest Genetic Resources to underpin a framework for action aiming to enhance forest genetic resources programmes at local, national, regional, eco-regional and global levels is a challenging and timely task. Follow-up action and the implementation of the recommendations of the report, which should be endorsed by countries which have provided the information on which it is based, will be an even greater challenge.

The scope and urgency of the problem call for long-term political support at the international, national and local levels. While FAO and other international agencies, in collaboration with regional institutions and networks, can support and help catalyse and coordinate action, success can only be achieved through the commitment of individual countries. Cooperation among a range of national governmental and non-governmental agencies in forestry and related sectors, public and private institutions, industry and local communities, is a further prerequisite for the successful implementation of sustainable conservation and genetic management programmes.

Recently increased attention and calls for intensified action and collaboration are clear indications of the growing recognition of the fact that conservation of forest biological diversity and the wise management of forest genetic resources is of vital importance, and that they are not limiting factors to development but pre-conditions for human well-being. The process described above will help underpin efforts to meet such needs and aspirations in a lasting manner.

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Argan trees on a mountainside north of Agadir in Morocco.  
Photo A. Galiana.

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